SYN axioms

SYN000+0.ax A simple include file for FOF
ia_1 fof(ia_1, axiom)
ia_2 fof(ia_2, axiom)
ia_3 fof(ia_3, axiom)

SYN000-0.ax A simple include file for CNF
ia_1 cnf(ia_1, axiom)
ia_2 cnf(ia_2, axiom)
ia_3 cnf(ia_3, axiom)

SYN000∧0.ax A simple include file for THF
ia_1: $o thf(ia1_type, type)
ia_2: $o thf(ia2_type, type)
ia_3: $o thf(ia3_type, type)
ia_1 thf(ia_1, axiom)
ia_2 thf(ia_2, axiom)
ia_3 thf(ia_3, axiom)

SYN000_0.ax A simple include file for TFF
ia_1: $o tff(ia1_type, type)
ia_2: $o tff(ia2_type, type)
ia_3: $o tff(ia3_type, type)
ia_1 tff(ia_1, axiom)
ia_2 tff(ia_2, axiom)
ia_3 tff(ia_3, axiom)

SYN002+0.ax Orevkov formula
r(x,y,z)=y+2∧x=z
$\forall y$: $r(y, 0, \text{succ}(y))$ fof(hyp_1, axiom)
$\forall y, x, z, z_1$: $(r(y, x, z) \Rightarrow (r(z, x, z_1) \Rightarrow r(y, \text{succ}(x), z_1)))$ fof(hyp_2, axiom)

SYN problems

SYN000+1.p Basic TPTP FOF syntax
Basic TPTP FOF syntax that you can't survive without parsing.
$(p_0$ and $\neg\, q_0) \Rightarrow (r_0$ or $\neg\, s_0)$ fof(propositional, axiom)
$\forall x$: $((p(x)$ or $\neg\, q(x, a)) \Rightarrow \exists y, z$: $(r(x, f(y), g(x, f(y), z))$ and $\neg\, s(f(f(f(b))))))$ fof(first_order, axiom)
$\exists y$: $\forall x, z$: $(f(y) = g(x, f(y), z)$ or $f(f(f(b))) \neq a$ or $x = f(y))$ fof(equality, axiom)
$true or $false fof(true_false, axiom)
'A proposition' or 'A predicate'(a) or p('A constant') or p('A function'(a)) or p('A q́uotedescape') fof(single_quoted, axio
$\forall x$: $((p(x) \Leftarrow \neg\, q(x, a)) \iff \exists y, z$: $r(x, f(y), g(x, f(y), z)) <> \neg\, s(f(f(f(b)))))$ fof(useful_connectives, axiom)
$\forall x$: $((p(x)$ or $\neg\, q(x, a)) \Rightarrow \exists y, z$: $(r(x, f(y), g(x, f(y), z))$ and $\neg\, s(f(f(f(b))))))$ fof(123, axiom)
$p(h)$ fof(role_hypothesis, hypothesis)
$\exists x$: $p(x)$ fof(role_conjecture, conjecture)
include('Axioms/SYN000+0.ax')

SYN000+2.p Advanced TPTP FOF syntax
Advanced TPTP FOF syntax that you will encounter some time.
"An Apple" $\neq$ "A M̈icrosoftescape" fof(distinct_object, axiom)
$p(12)$ or $p(-12)$ fof(integers, axiom)
$p(123/456)$ or $p(-123/456)$ or $p(+123/456)$ fof(rationals, axiom)
$p(123._{456})$ or $p(-123._{456})$ or $p(123.456\text{E}_{78})$ or $p(123.456\text{e}_{78})$ or $p(-123.456\text{E}_{78})$ or $p(123.456\text{E-}_{78})$ or $p(-123.456\text{E-}_{78})$ fof
$\forall x$: $(p(x)$ nor $\neg\, q(x, a))$ nand $p(x)$ fof(never_used_connectives, axiom)
$\forall x$: $f(d) = f(x)$ fof(role_definition, definition)
$p(a)$ fof(role_assumption, assumption)
$p(l)$ fof(role_lemma, lemma)
$p(t)$ fof(role_theorem, theorem)
$p(u)$ fof(role_unknown, unknown)
include('Axioms/SYN000+0.ax', [ia_1, ia_3])
$\forall x$: $p(x)$ fof(source_unknown, axiom)

$\forall x$: $p(x)$ fof(source, axiom)
$\forall x$: $p(x)$ fof(source_name, axiom)
$\forall x$: $p(x)$ fof(source_copy, axiom)
$\forall x$: $p(x)$ fof(source_introduced_assumption, axiom)
$p(a)$ fof(source_inference, axiom)
$p(a)$ fof(source_inference_with_bind, axiom)
$\forall x$: $p(x)$ fof(useful_info, axiom)

SYN000-1.p Basic TPTP CNF syntax
Basic TPTP CNF syntax that you can't survive without parsing.
(q_0 and s_0) $\Rightarrow$ (p_0 or r_0) cnf(propositional, axiom)
($q(x, a)$ and $s(f(f(f(b))))$) $\Rightarrow$ ($p(x)$ or $r(x, f(y), g(x, f(y), z))$) cnf(first_order, axiom)
$f(f(f(b))) = a$ $\Rightarrow$ ($f(y) = g(x, f(y), z)$ or $x = f(y)$) cnf(equality, axiom)
$true or $false cnf(true_false, axiom)
'A proposition' or 'A predicate'(y) or p('A constant') or p('A function'(a)) or p('A q́uotedescape') cnf(single_quoted, axio
($q(x, a)$ and $s(f(f(f(b))))$) $\Rightarrow$ ($p(x)$ or $r(x, f(y), g(x, f(y), z))$) cnf(123, axiom)
$p(h)$ cnf(role_hypothesis, hypothesis)
$\neg\, p(x)$ cnf(role_negated_conjecture, negated_conjecture)
include('Axioms/SYN000-0.ax')

SYN000-2.p Advanced TPTP CNF syntax
Advanced TPTP CN̈F syntax that you will encounter some time.
"An Apple" $\neq$ "A M̈icrosoftescape" cnf(distinct_object, axiom)
$p(12)$ or $p(-12)$ cnf(integers, axiom)
$p(123/456)$ or $p(-123/456)$ or $p(+123/456)$ cnf(rationals, axiom)
$p(123._{456})$ or $p(-123._{456})$ or $p(123.456E_{78})$ or $p(123.456e_{78})$ or $p(-123.456E_{78})$ or $p(123.456E\text{-}_{78})$ or $p(-123.456E\text{-}_{78})$ cn
$f(d) = f(x)$ cnf(role_definition, definition)
$p(a)$ cnf(role_assumption, assumption)
$p(l)$ cnf(role_lemma, lemma)
$p(t)$ cnf(role_theorem, theorem)
$p(u)$ cnf(role_unknown, unknown)
include('Axioms/SYN000-0.ax', [ia_1, ia_3])
$p(x)$ cnf(source_unknown, axiom)
$p(x)$ cnf(source, axiom)
$p(x)$ cnf(source_name, axiom)
$p(x)$ cnf(source_copy, axiom)
$p(x)$ cnf(source_introduced_assumption, axiom)
$p(a)$ cnf(source_inference, axiom)
$p(a)$ cnf(source_inference_with_bind, axiom)
$p(x)$ cnf(useful_info, axiom)

SYN000∧1.p Basic TPTP
Basic TPTP that you can't survive without parsing.
p_0: $o thf(p0_type, type)
q_0: $o thf(q0_type, type)
r_0: $o thf(r0_type, type)
s_0: $o thf(s0_type, type)
(p_0 and $\neg\, q_0$) $\Rightarrow$ (r_0 or $\neg\, s_0$) thf(propositional, axiom)
a: $i thf(a_type, type)
b: $i thf(b_type, type)
h: $i thf(h_type, type)
f: $i $\rightarrow$ $i thf(f_type, type)
g: $i $\rightarrow$ $i $\rightarrow$ $i $\rightarrow$ $i thf(g_type, type)
p: $i $\rightarrow$ $o thf(p_type, type)
q: $i $\rightarrow$ $i $\rightarrow$ $o thf(q_type, type)
r: $i $\rightarrow$ $i $\rightarrow$ $i $\rightarrow$ $o thf(r_type, type)
s: $i $\rightarrow$ $o thf(s_type, type)
$\forall x$: $i: (($p@x$ or $\neg\, q@x@a$) $\Rightarrow$ $\exists y$: $i, z: $i: ($r@x@(f@y)@(g@x@(f@y)@z)$ and $\neg\, s@(f@(f@(f@b)))))) thf(first_order, ax
$\exists y$: $i: $\forall x$: $i, z: $i: (($f@y) = ($g@x@(f@y)@z) or ($f@(f@(f@b))) $\neq$ a or $x = ($f@y)) thf(equality, axiom)
$true or $false thf(true_false, axiom)
'A proposition': $o thf(quoted_proposition_type, type)

'A predicate': $i → $o thf(quoted_predicate_type, type)
'A constant': $i thf(quoted_constant_type, type)
'A function': $i → $i thf(quoted_function_type, type)
'A q́uotedescape': $i thf(quoted_escape_type, type)
'A proposition' or 'A predicate'@a or p@'A constant' or p@('A function'@a) or p@'A q́uotedescape' thf(single_quoted, ax
$\forall x$: $i: (((p@x) ⇐ ¬ q@x@a) ⟺ ∃y: $i, z: $i: (r@x@(f@y)@(g@x@(f@y)@z)) <> ¬ s@(f@(f@(f@b)))) thf(useful_co
l_1: $i → ($i → $o) → $o thf(l1_type, type)
l_2: ($i → ($i → $i) → $i) → $o thf(l2_type, type)
$l_1 = (\lambda c$: $i, p: $i → $o: ($p$@$c$)) thf(lambda_defn, axiom)
l_2@λc: $i, f: $i → $i: ($f$@$c$) thf(lambda_use, axiom)
new: $tType thf(new_type, type)
newc: new thf(newc_type, type)
newf: new → $i → new thf(newf_type, type)
newp: new → $i → $o thf(newp_type, type)
$\forall x$: new: (newp@(newf@newc@a)@a) thf(new_axiom, axiom)
$\forall x$: $i: (($p$@$x$ or ¬ q@x@a) ⇒ ∃y: $i, z: $i: ($r$@$x$@($f$@$y$)@($g$@$x$@($f$@$y$)@$z$) and ¬ s@(f@(f@(f@b)))) thf(123, axiom)
p@h thf(role_hypothesis, hypothesis)
∃x: $i: ($p$@$x$) thf(role_conjecture, conjecture)
include('Axioms/SYN000^0.ax')

SYN000_1.p Basic TPTP TF0 syntax without arithmetic
Basic TPTP TF0 syntax that you can't survive without parsing.
p_0: $o tff(p0_type, type)
q_0: $o tff(q0_type, type)
r_0: $o tff(r0_type, type)
s_0: $o tff(s0_type, type)
(p_0 and ¬ q_0) ⇒ (r_0 or ¬ s_0) tff(propositional, axiom)
a: $i tff(a_type, type)
b: $i tff(b_type, type)
h: $i tff(h_type, type)
f: $i → $i tff(f_type, type)
g: ($i × $i × $i) → $i tff(g_type, type)
p: $i → $o tff(p_type, type)
q: ($i × $i) → $o tff(q_type, type)
r: ($i × $i × $i) → $o tff(r_type, type)
s: $i → $o tff(s_type, type)
∀x: $i: (($p(x)$ or ¬ $q(x, a)$) ⇒ ∃y: $i, z: $i: ($r(x, f(y), g(x, f(y), z))$ and ¬ $s(f(f(f(b))))$) tff(first_order, axiom)
∃y: $i: ∀$x$: $i, z: $i: ($f(y) = g(x, f(y), z)$ or $f(f(f(b))) \neq a$ or $x = f(y)$) tff(equality, axiom)
$true or $false tff(true_false, axiom)
'A proposition': $o tff(quoted_proposition_type, type)
'A predicate': $i → $o tff(quoted_predicate_type, type)
'A constant': $i tff(quoted_constant_type, type)
'A function': $i → $i tff(quoted_function_type, type)
'A q́uotedescape': $i tff(quoted_escape_type, type)
'A proposition' or 'A predicate'(a) or p('A constant') or p('A function'(a)) or p('A q́uotedescape') tff(single_quoted, axio
∀x: $i: (($p(x)$ ⇐ ¬ $q(x, a)$) ⟺ ∃y: $i, z: $i: $r(x, f(y), g(x, f(y), z))$ <> ¬ $s(f(f(f(b))))$) tff(useful_connectives, axiom)
new: $tType tff(new_type, type)
newc: new tff(newc_type, type)
newf: (new × $i) → new tff(newf_type, type)
newp: (new × $i) → $o tff(newp_type, type)
∀x: new: newp(newf(newc, a), a) tff(new_axiom, axiom)
∀x: $i: (($p(x)$ or ¬ $q(x, a)$) ⇒ ∃y: $i, z: $i: ($r(x, f(y), g(x, f(y), z))$ and ¬ $s(f(f(f(b))))$) tff(123, axiom)
$p(h)$ tff(role_hypothesis, hypothesis)
∃x: $i: $p(x)$ tff(role_conjecture, conjecture)
include('Axioms/SYN000_0.ax')

SYN000_2.p Advanced TPTP TF0 syntax without arithmetic
Advanced TPTP TF0 syntax that you will encounter some time.
"An Apple" ≠ "A M̈icrosoftescape̋" tff(distinct_object, axiom)
a: $i tff(a_type, type)

b: $i tff(b_type, type)
f: $i → $i tff(f_type, type)
g: ($i × $i) → $i tff(g_type, type)
h: ($i × $i × $i) → $i tff(h_type, type)
p: $i → $o tff(p_type, type)
q: ($i × $i) → $o tff(q_type, type)
$\forall z$: $i: $ite_f($\exists x$: $i: $p(x)$, $\forall x$: $i: $q(x, x)$, $q(z,$ $ite_t($\forall x$: $i: $p(x)$, $f(a)$, $f(z))))$ tff(conditionals, axiom)
$\forall x$: $i: $let_ff($\forall y_1$: $i, y_2: $i: $(q(y_1, y_2) \iff p(y_1))$, $q($$let_tt($\forall z_1$: $i: $f(z_1) = g(z_1, b)$, $f(a))$, $x)$ and $p($$let_ft($\forall y_3$: $i, y_4: $i: $(q(y$
$ite_f($y_3 = y_4$, $q(a, a)$, $q(y_3, y_4)))$, $ite_t($q(b, b)$, $f(a)$, $f(x)))))$ tff(let_binders, axiom)
$\forall x$: $i: $(p(x)$ nor $\neg\, q(x, a))$ nand $p(x)$ tff(never_used_connectives, axiom)
$\forall x$: $i: $f(a) = f(x)$ tff(role_definition, definition)
$p(a)$ tff(role_assumption, assumption)
$p(a)$ tff(role_lemma, lemma)
$p(a)$ tff(role_theorem, theorem)
$p(a)$ tff(role_unknown, unknown)
include('Axioms/SYN000_0.ax', [ia_1, ia_3])
$\forall x$: $i: $p(x)$ tff(source_unknown, axiom)
$\forall x$: $i: $p(x)$ tff(source, axiom)
$\forall x$: $i: $p(x)$ tff(source_name, axiom)
$\forall x$: $i: $p(x)$ tff(source_copy, axiom)
$\forall x$: $i: $p(x)$ tff(source_introduced_assumption, axiom)
$p(a)$ tff(source_inference, axiom)
$p(a)$ tff(source_inference_with_bind, axiom)
$\forall x$: $i: $p(x)$ tff(useful_info, axiom)

SYN001+1.p Pelletier 2
2: A biconditional version of the 'most difficult' theorem proved by the new logic theorist.
$\neg\, \neg\, p \iff p$ fof(pel_2, conjecture)

SYN001∧4.001.p Pelletier 2
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
ivalid@(iequiv@(inot@(inot@(iatom@p)))@(iatom@p)) thf(pel_2, conjecture)

SYN001∧4.002.p ILTP Problem SYJ212+1.002
include('Axioms/LCL010^0.ax')
a_1: $i → $o thf(a1_type, type)
a_2: $i → $o thf(a2_type, type)
ivalid@(iequiv@(iequiv@(inot@(inot@(iatom@a_1)))@(iatom@a_2))@(iequiv@(iatom@a_2)@(iatom@a_1))) thf(con, conjectur

SYN001∧4.003.p ILTP Problem SYJ212+1.003
include('Axioms/LCL010^0.ax')
a_1: $i → $o thf(a1_type, type)
a_2: $i → $o thf(a2_type, type)
a_3: $i → $o thf(a3_type, type)
ivalid@(iequiv@(iequiv@(iequiv@(inot@(inot@(iatom@a_1)))@(iatom@a_2))@(iatom@a_3))@(iequiv@(iatom@a_3)@(iequiv@(iat

SYN001∧4.004.p ILTP Problem SYJ212+1.004
include('Axioms/LCL010^0.ax')
a_1: $i → $o thf(a1_type, type)
a_2: $i → $o thf(a2_type, type)
a_3: $i → $o thf(a3_type, type)
a_4: $i → $o thf(a4_type, type)
ivalid@(iequiv@(iequiv@(iequiv@(iequiv@(inot@(inot@(iatom@a_1)))@(iatom@a_2))@(iatom@a_3))@(iatom@a_4))@(iequiv@(ia

SYN002-1.007.008.p Odd and Even Problem
Given by the clauses C1: p(X) ∨ p(f∧M(X)) and C2: p(X) ∨ p(f∧N(X)), where if M is odd N is even and vice versa,
N > M. The sizes are used for N and M.
$p(x)$ or $p(f(f(f(f(f(f(f(x)))))))$ cnf(positive, negated_conjecture)
$p(x) \Rightarrow \neg\, p(f(f(f(f(f(f(f(f(x))))))))$ cnf(negative, negated_conjecture)

SYN003-1.006.p Implications that form a contradiction

P1 & Q1 → P2 P1 & R1 → P2 Q → Q1 R → R1 : P2 & Q2 → P3 P2 & R2 → P3 Q → Q2 R → R2 : .... : Pk-1 & Qk-1 →Pk Pk-1 & Rk-1 → Pk Q → Qk-1 R → Rk-1 : P1 Pk Q R : : The size is k, in the above.

$(p_1$ and $q_1) \Rightarrow p_2$ cnf(pqp$_1$, negated_conjecture)
$(p_2$ and $q_2) \Rightarrow p_3$ cnf(pqp$_2$, negated_conjecture)
$(p_3$ and $q_3) \Rightarrow p_4$ cnf(pqp$_3$, negated_conjecture)
$(p_4$ and $q_4) \Rightarrow p_5$ cnf(pqp$_4$, negated_conjecture)
$(p_5$ and $q_5) \Rightarrow p_6$ cnf(pqp$_5$, negated_conjecture)
$(p_1$ and $r_1) \Rightarrow p_2$ cnf(prp$_1$, negated_conjecture)
$(p_2$ and $r_2) \Rightarrow p_3$ cnf(prp$_2$, negated_conjecture)
$(p_3$ and $r_3) \Rightarrow p_4$ cnf(prp$_3$, negated_conjecture)
$(p_4$ and $r_4) \Rightarrow p_5$ cnf(prp$_4$, negated_conjecture)
$(p_5$ and $r_5) \Rightarrow p_6$ cnf(prp$_5$, negated_conjecture)
$q \Rightarrow q_1$ cnf(qq$_1$, negated_conjecture)
$q \Rightarrow q_2$ cnf(qq$_2$, negated_conjecture)
$q \Rightarrow q_3$ cnf(qq$_3$, negated_conjecture)
$q \Rightarrow q_4$ cnf(qq$_4$, negated_conjecture)
$q \Rightarrow q_5$ cnf(qq$_5$, negated_conjecture)
$r \Rightarrow r_1$ cnf(rr$_1$, negated_conjecture)
$r \Rightarrow r_2$ cnf(rr$_2$, negated_conjecture)
$r \Rightarrow r_3$ cnf(rr$_3$, negated_conjecture)
$r \Rightarrow r_4$ cnf(rr$_4$, negated_conjecture)
$r \Rightarrow r_5$ cnf(rr$_5$, negated_conjecture)
p_1 cnf(base$_1$, negated_conjecture)
$\neg\, p_6$ cnf(base$_2$, negated_conjecture)
q cnf(base$_3$, negated_conjecture)
r cnf(base$_4$, negated_conjecture)

SYN004-1.007.p Implications that form a contradiction

P1 & Q1 → P2 P1 & Q1 → Q2 : P2 & Q2 → P3 P2 & Q2 → Q3 : .... : Pk-1 & Qk-1 →Pk Pk-1 & Qk-1 → Qk : P1 Q1 Pk ∨ Qk : : The size is k, in the above.

$(p_1$ and $q_1) \Rightarrow p_2$ cnf(pqp$_1$, negated_conjecture)
$(p_2$ and $q_2) \Rightarrow p_3$ cnf(pqp$_2$, negated_conjecture)
$(p_3$ and $q_3) \Rightarrow p_4$ cnf(pqp$_3$, negated_conjecture)
$(p_4$ and $q_4) \Rightarrow p_5$ cnf(pqp$_4$, negated_conjecture)
$(p_5$ and $q_5) \Rightarrow p_6$ cnf(pqp$_5$, negated_conjecture)
$(p_6$ and $q_6) \Rightarrow p_7$ cnf(pqp$_6$, negated_conjecture)
$(p_1$ and $q_1) \Rightarrow q_2$ cnf(pqq$_1$, negated_conjecture)
$(p_2$ and $q_2) \Rightarrow q_3$ cnf(pqq$_2$, negated_conjecture)
$(p_3$ and $q_3) \Rightarrow q_4$ cnf(pqq$_3$, negated_conjecture)
$(p_4$ and $q_4) \Rightarrow q_5$ cnf(pqq$_4$, negated_conjecture)
$(p_5$ and $q_5) \Rightarrow q_6$ cnf(pqq$_5$, negated_conjecture)
$(p_6$ and $q_6) \Rightarrow q_7$ cnf(pqq$_6$, negated_conjecture)
p_1 cnf(base$_1$, negated_conjecture)
q_1 cnf(base$_2$, negated_conjecture)
$p_7 \Rightarrow \neg\, q_7$ cnf(base$_3$, negated_conjecture)

SYN005-1.010.p Disjunctions that form a contradiction

p1(X1,X2) ∨ p2(X2,X3) ∨ ... ∨ p10(X10,X1). p1(a,a) p2(a,a) ... p10(a,a)

$(p_1(x_1, x_2)$ and $p_2(x_2, x_3)$ and $p_3(x_3, x_4)$ and $p_4(x_4, x_5)$ and $p_5(x_5, x_6)$ and $p_6(x_6, x_7)$ and $p_7(x_7, x_8)$ and $p_8(x_8, x_9)$ and $p_9(x$
$\neg\, p_{10}(x_{10}, x_1)$ cnf(disjunction, negated_conjecture)
$p_1(a, a)$ cnf(p_1, negated_conjecture)
$p_2(a, a)$ cnf(p_2, negated_conjecture)
$p_3(a, a)$ cnf(p_3, negated_conjecture)
$p_4(a, a)$ cnf(p_4, negated_conjecture)
$p_5(a, a)$ cnf(p_5, negated_conjecture)
$p_6(a, a)$ cnf(p_6, negated_conjecture)
$p_7(a, a)$ cnf(p_7, negated_conjecture)
$p_8(a, a)$ cnf(p_8, negated_conjecture)
$p_9(a, a)$ cnf(p_9, negated_conjecture)
$p_{10}(a, a)$ cnf(p_{10}, negated_conjecture)

SYN006-1.p A problem to demonstrate controlling splits
$p_1(x, f(y)) \Rightarrow (q_1(f(x), y)$ or $q_2(x, f(y)))$ cnf(clause$_1$, negated_conjecture)
$p_1(a, y)$ cnf(clause$_2$, negated_conjecture)
$\neg\, q_2(x, f(y))$ cnf(clause$_3$, negated_conjecture)
$p_2(x, f(y)) \Rightarrow (q_3(f(x), y)$ or $q_4(x, f(y)))$ cnf(clause$_4$, negated_conjecture)
$\neg\, q_3(x, g(y))$ cnf(clause$_5$, negated_conjecture)
$\neg\, q_4(f(f(x)), f(g(f(y))))$ cnf(clause$_6$, negated_conjecture)
$q_1(x, f(y)) \Rightarrow p_2(f(x), y)$ cnf(clause$_7$, negated_conjecture)

SYN007+1.014.p Pelletier Problem 71
Clausal forms of statements of the form : (p1 <→ (p2 <→...(pN <→ (p1 <→ (p2 <→...<→ pN)...)
$p_1 \iff (p_2 \iff (p_3 \iff (p_4 \iff (p_5 \iff (p_6 \iff (p_7 \iff (p_8 \iff (p_9 \iff (p_{10} \iff (p_{11} \iff (p_{12} \iff (p_{13} \iff (p_{14} \iff (p_1 \iff (p_2 \iff (p_3 \iff (p_4 \iff (p_5 \iff (p_6 \iff (p_7 \iff (p_8 \iff (p_9 \iff (p_{10} \iff (p_{11} \iff (p_{12} \iff (p_{13} \iff p_{14}))))))))))))))))))))))))))))$ fof(prove_this, conjecture)

SYN007∧4.014.p Pelletier Problem 71
include('Axioms/LCL010^0.ax')
p_1: $i → $o thf(p_1_type, type)
p_{10}: $i → $o thf(p_10_type, type)
p_{11}: $i → $o thf(p_11_type, type)
p_{12}: $i → $o thf(p_12_type, type)
p_{13}: $i → $o thf(p_13_type, type)
p_{14}: $i → $o thf(p_14_type, type)
p_2: $i → $o thf(p_2_type, type)
p_3: $i → $o thf(p_3_type, type)
p_4: $i → $o thf(p_4_type, type)
p_5: $i → $o thf(p_5_type, type)
p_6: $i → $o thf(p_6_type, type)
p_7: $i → $o thf(p_7_type, type)
p_8: $i → $o thf(p_8_type, type)
p_9: $i → $o thf(p_9_type, type)
ivalid@(iequiv@(iatom@p_1)@(iequiv@(iatom@p_2)@(iequiv@(iatom@p_3)@(iequiv@(iatom@p_4)@(iequiv@(iatom@p_5)@(iequiv@

SYN008-1.p A problem to demonstrate the usefulness of relevancy testing
$\neg\, p$ cnf(clause$_1$, negated_conjecture)
$\neg\, q$ cnf(clause$_2$, negated_conjecture)
r cnf(clause$_3$, negated_conjecture)
$r \Rightarrow (a$ or $b)$ cnf(clause$_4$, negated_conjecture)
$r \Rightarrow (p$ or c or $d)$ cnf(clause$_5$, negated_conjecture)
$r \Rightarrow (p$ or $q)$ cnf(clause$_6$, negated_conjecture)

SYN009-1.p A problem to demonstrate the usefulness of relevancy testing
$\neg\, p(c, x, y)$ cnf(clause$_1$, negated_conjecture)
$\neg\, q(x, c, y)$ cnf(clause$_2$, negated_conjecture)
$\neg\, r(x, y, c)$ cnf(clause$_3$, negated_conjecture)
$s(a)$ cnf(clause$_4$, negated_conjecture)
$s(b)$ cnf(clause$_5$, negated_conjecture)
$s(c)$ cnf(clause$_6$, negated_conjecture)
$(s(x)$ and $s(y)$ and $s(z)) \Rightarrow (p(x, y, z)$ or $q(x, y, z)$ or $r(x, y, z))$ cnf(clause$_7$, negated_conjecture)

SYN009-2.p A problem to demonstrate the usefulness of relevancy testing
$p(x, y, z) \Rightarrow \neg\, t(x, y, z)$ cnf(clause$_1$, negated_conjecture)
$q(x, y, z) \Rightarrow \neg\, t(y, z, x)$ cnf(clause$_2$, negated_conjecture)
$r(x, y, z) \Rightarrow \neg\, t(z, x, y)$ cnf(clause$_3$, negated_conjecture)
$s(a)$ cnf(clause$_4$, negated_conjecture)
$s(b)$ cnf(clause$_5$, negated_conjecture)
$s(c)$ cnf(clause$_6$, negated_conjecture)
$t(c, c, c)$ cnf(clause$_7$, negated_conjecture)
$(s(x)$ and $s(y)$ and $s(z)) \Rightarrow (p(x, y, z)$ or $q(y, z, x)$ or $r(z, x, y))$ cnf(clause$_8$, negated_conjecture)

SYN009-3.p A problem to demonstrate the usefulness of relevancy testing
$p(x, y, z) \Rightarrow \neg\, t(x, y, z)$ cnf(clause$_1$, negated_conjecture)
$q(x, y, z) \Rightarrow \neg\, t(x, y, z)$ cnf(clause$_2$, negated_conjecture)

$r(x,y,z) \Rightarrow \neg\, t(x,y,z)$ cnf(clause$_3$, negated_conjecture)
$s(a)$ cnf(clause$_4$, negated_conjecture)
$s(b)$ cnf(clause$_5$, negated_conjecture)
$s(c)$ cnf(clause$_6$, negated_conjecture)
$\neg\, v(x,y,z)$ cnf(clause$_7$, negated_conjecture)
$u(c,c,c)$ cnf(clause$_8$, negated_conjecture)
$(s(x)$ and $s(y)$ and $s(z)) \Rightarrow (p(x,y,z)$ or $q(x,y,z)$ or $r(x,y,z))$ cnf(clause$_9$, negated_conjecture)
$u(x,y,z) \Rightarrow (t(x,y,z)$ or $v(x,y,z))$ cnf(clause$_{10}$, negated_conjecture)

SYN009-4.p A problem to demonstrate the usefulness of relevancy testing
$p(x,y,z) \Rightarrow \neg\, m(x,y,z)$ cnf(clause$_1$, negated_conjecture)
$q(x,y,z) \Rightarrow \neg\, m(x,y,z)$ cnf(clause$_2$, negated_conjecture)
$r(x,y,z) \Rightarrow \neg\, m(x,y,z)$ cnf(clause$_3$, negated_conjecture)
$s(a)$ cnf(clause$_4$, negated_conjecture)
$s(b)$ cnf(clause$_5$, negated_conjecture)
$s(c)$ cnf(clause$_6$, negated_conjecture)
$\neg\, n(c,c,c)$ cnf(clause$_7$, negated_conjecture)
$(s(x)$ and $s(y)$ and $s(z)) \Rightarrow (p(x,y,z)$ or $q(x,y,z)$ or $r(x,y,z))$ cnf(clause$_8$, negated_conjecture)
$(s(x)$ and $s(y)$ and $s(z)) \Rightarrow (m(x,y,z)$ or $n(x,y,z))$ cnf(clause$_9$, negated_conjecture)

SYN010-1.005.005.p Example for Proposition 5.2 in [LMG94]
Example to show that connection tableaux with factorization cannot polynomially simulate simulate connection tableaux with folding up.
$\neg\, p_0$ cnf(clause$_1$, negated_conjecture)
$(\mathrm{p\_1}_1$ and $\mathrm{p\_1}_2$ and $\mathrm{p\_1}_3$ and $\mathrm{p\_1}_4$ and $\mathrm{p\_1}_5) \Rightarrow p_0$ cnf(clause$_2$, negated_conjecture)
$(\mathrm{p\_2}_1$ and $\mathrm{p\_2}_2$ and $\mathrm{p\_2}_3$ and $\mathrm{p\_2}_4$ and $\mathrm{p\_2}_5) \Rightarrow \mathrm{p\_1}_1$ cnf(clause$_3$, negated_conjecture)
$(\mathrm{p\_2}_1$ and $\mathrm{p\_2}_2$ and $\mathrm{p\_2}_3$ and $\mathrm{p\_2}_4$ and $\mathrm{p\_2}_5) \Rightarrow \mathrm{p\_1}_2$ cnf(clause$_4$, negated_conjecture)
$(\mathrm{p\_2}_1$ and $\mathrm{p\_2}_2$ and $\mathrm{p\_2}_3$ and $\mathrm{p\_2}_4$ and $\mathrm{p\_2}_5) \Rightarrow \mathrm{p\_1}_3$ cnf(clause$_5$, negated_conjecture)
$(\mathrm{p\_2}_1$ and $\mathrm{p\_2}_2$ and $\mathrm{p\_2}_3$ and $\mathrm{p\_2}_4$ and $\mathrm{p\_2}_5) \Rightarrow \mathrm{p\_1}_4$ cnf(clause$_6$, negated_conjecture)
$(\mathrm{p\_2}_1$ and $\mathrm{p\_2}_2$ and $\mathrm{p\_2}_3$ and $\mathrm{p\_2}_4$ and $\mathrm{p\_2}_5) \Rightarrow \mathrm{p\_1}_5$ cnf(clause$_7$, negated_conjecture)
$(\mathrm{p\_3}_1$ and $\mathrm{p\_3}_2$ and $\mathrm{p\_3}_3$ and $\mathrm{p\_3}_4$ and $\mathrm{p\_3}_5) \Rightarrow \mathrm{p\_2}_1$ cnf(clause$_8$, negated_conjecture)
$(\mathrm{p\_3}_1$ and $\mathrm{p\_3}_2$ and $\mathrm{p\_3}_3$ and $\mathrm{p\_3}_4$ and $\mathrm{p\_3}_5) \Rightarrow \mathrm{p\_2}_2$ cnf(clause$_9$, negated_conjecture)
$(\mathrm{p\_3}_1$ and $\mathrm{p\_3}_2$ and $\mathrm{p\_3}_3$ and $\mathrm{p\_3}_4$ and $\mathrm{p\_3}_5) \Rightarrow \mathrm{p\_2}_3$ cnf(clause$_{10}$, negated_conjecture)
$(\mathrm{p\_3}_1$ and $\mathrm{p\_3}_2$ and $\mathrm{p\_3}_3$ and $\mathrm{p\_3}_4$ and $\mathrm{p\_3}_5) \Rightarrow \mathrm{p\_2}_4$ cnf(clause$_{11}$, negated_conjecture)
$(\mathrm{p\_3}_1$ and $\mathrm{p\_3}_2$ and $\mathrm{p\_3}_3$ and $\mathrm{p\_3}_4$ and $\mathrm{p\_3}_5) \Rightarrow \mathrm{p\_2}_5$ cnf(clause$_{12}$, negated_conjecture)
$(\mathrm{p\_4}_1$ and $\mathrm{p\_4}_2$ and $\mathrm{p\_4}_3$ and $\mathrm{p\_4}_4$ and $\mathrm{p\_4}_5) \Rightarrow \mathrm{p\_3}_1$ cnf(clause$_{13}$, negated_conjecture)
$(\mathrm{p\_4}_1$ and $\mathrm{p\_4}_2$ and $\mathrm{p\_4}_3$ and $\mathrm{p\_4}_4$ and $\mathrm{p\_4}_5) \Rightarrow \mathrm{p\_3}_2$ cnf(clause$_{14}$, negated_conjecture)
$(\mathrm{p\_4}_1$ and $\mathrm{p\_4}_2$ and $\mathrm{p\_4}_3$ and $\mathrm{p\_4}_4$ and $\mathrm{p\_4}_5) \Rightarrow \mathrm{p\_3}_3$ cnf(clause$_{15}$, negated_conjecture)
$(\mathrm{p\_4}_1$ and $\mathrm{p\_4}_2$ and $\mathrm{p\_4}_3$ and $\mathrm{p\_4}_4$ and $\mathrm{p\_4}_5) \Rightarrow \mathrm{p\_3}_4$ cnf(clause$_{16}$, negated_conjecture)
$(\mathrm{p\_4}_1$ and $\mathrm{p\_4}_2$ and $\mathrm{p\_4}_3$ and $\mathrm{p\_4}_4$ and $\mathrm{p\_4}_5) \Rightarrow \mathrm{p\_3}_5$ cnf(clause$_{17}$, negated_conjecture)
$(\mathrm{p\_5}_1$ and $\mathrm{p\_5}_2$ and $\mathrm{p\_5}_3$ and $\mathrm{p\_5}_4$ and $\mathrm{p\_5}_5) \Rightarrow \mathrm{p\_4}_1$ cnf(clause$_{18}$, negated_conjecture)
$(\mathrm{p\_5}_1$ and $\mathrm{p\_5}_2$ and $\mathrm{p\_5}_3$ and $\mathrm{p\_5}_4$ and $\mathrm{p\_5}_5) \Rightarrow \mathrm{p\_4}_2$ cnf(clause$_{19}$, negated_conjecture)
$(\mathrm{p\_5}_1$ and $\mathrm{p\_5}_2$ and $\mathrm{p\_5}_3$ and $\mathrm{p\_5}_4$ and $\mathrm{p\_5}_5) \Rightarrow \mathrm{p\_4}_3$ cnf(clause$_{20}$, negated_conjecture)
$(\mathrm{p\_5}_1$ and $\mathrm{p\_5}_2$ and $\mathrm{p\_5}_3$ and $\mathrm{p\_5}_4$ and $\mathrm{p\_5}_5) \Rightarrow \mathrm{p\_4}_4$ cnf(clause$_{21}$, negated_conjecture)
$(\mathrm{p\_5}_1$ and $\mathrm{p\_5}_2$ and $\mathrm{p\_5}_3$ and $\mathrm{p\_5}_4$ and $\mathrm{p\_5}_5) \Rightarrow \mathrm{p\_4}_5$ cnf(clause$_{22}$, negated_conjecture)
$\mathrm{p\_5}_1$ cnf(clause$_{23}$, negated_conjecture)
$\mathrm{p\_5}_2$ cnf(clause$_{24}$, negated_conjecture)
$\mathrm{p\_5}_3$ cnf(clause$_{25}$, negated_conjecture)
$\mathrm{p\_5}_4$ cnf(clause$_{26}$, negated_conjecture)
$\mathrm{p\_5}_5$ cnf(clause$_{27}$, negated_conjecture)

SYN011-1.p A problem to demonstrate C-reduction
$n \Rightarrow \neg\, t$ cnf(clause$_1$, negated_conjecture)
m or q or n cnf(clause$_2$, negated_conjecture)
$m \Rightarrow l$ cnf(clause$_3$, negated_conjecture)
$q \Rightarrow l$ cnf(clause$_4$, negated_conjecture)
$l \Rightarrow \neg\, p$ cnf(clause$_5$, negated_conjecture)
r or p or n cnf(clause$_6$, negated_conjecture)
$r \Rightarrow \neg\, l$ cnf(clause$_7$, negated_conjecture)
t cnf(clause$_8$, negated_conjecture)

SYN012-1.p A problem to demonstrate Model Elimination
(big_f(x, y) and big_f($x, g(x, y)$)) $\Rightarrow$ big_g($y, g(x, y)$) cnf(clause$_1$, negated_conjecture)
(big_f(x, y) and big_g($y, g(x, y)$)) $\Rightarrow$ big_f($x, g(x, y)$) cnf(clause$_2$, negated_conjecture)
(big_f(x, y) and big_f($g(x, y), g(x, y)$)) $\Rightarrow$ big_g($g(x, y), g(x, y)$) cnf(clause$_3$, negated_conjecture)
big_f(x, y) or big_f($g(x, y), g(x, y)$) cnf(clause$_4$, negated_conjecture)
big_g($g(x, y), g(x, y)$) $\Rightarrow$ big_f(x, y) cnf(clause$_5$, negated_conjecture)
big_g(x, y) or big_g($g(x, y), g(x, y)$) cnf(clause$_6$, negated_conjecture)
big_g(x, y) $\Rightarrow$ $\neg$ big_g($g(x, y), g(x, y)$) cnf(clause$_7$, negated_conjecture)

SYN013-1.p A problem in quantification theory
$m \neq n$ cnf(c_1, negated_conjecture)
$n \neq k$ cnf(c_2, negated_conjecture)
$k \neq m$ cnf(c_3, negated_conjecture)
(element(y, m) and $f(y) = m$) $\Rightarrow$ $y = m$ cnf(c_4, negated_conjecture)
(element(y, m) and $f(y) = y$) $\Rightarrow$ $y = m$ cnf(c_5, negated_conjecture)
element(y, m) $\Rightarrow$ ($y = m$ or element($y, f(y)$)) cnf(c_6, negated_conjecture)
element(y, m) $\Rightarrow$ ($y = m$ or element($f(y), y$)) cnf(c_7, negated_conjecture)
(element(y, v) and element(v, y)) $\Rightarrow$ ($y = m$ or element(y, m) or $v = m$ or $v = y$) cnf(c_8, negated_conjecture)
$g(y) = n$ $\Rightarrow$ ($y = n$ or element(y, n)) cnf(c_9, negated_conjecture)
$g(y) = y$ $\Rightarrow$ ($y = n$ or element(y, n)) cnf(c_{10}, negated_conjecture)
$y = n$ or element(y, n) or element($y, g(y)$) cnf(c_{11}, negated_conjecture)
$y = n$ or element(y, n) or element($g(y), y$) cnf(c_{12}, negated_conjecture)
(element(y, n) and element(y, v) and element(v, y)) $\Rightarrow$ ($y = n$ or $v = n$ or $v = y$) cnf(c_{13}, negated_conjecture)
$y = m$ $\Rightarrow$ ($y = k$ or element(y, k)) cnf(c_{14}, negated_conjecture)
$y = n$ $\Rightarrow$ ($y = k$ or element(y, k)) cnf(c_{15}, negated_conjecture)
element(y, k) $\Rightarrow$ ($y = k$ or $y = m$ or $y = n$) cnf(c_{16}, negated_conjecture)

SYN014-1.p A problem in quantification theory
$m \neq n$ cnf(c_1, negated_conjecture)
$n = k$ or $m = k$ cnf(c_2, negated_conjecture)
$y = k$ $\Rightarrow$ ($y = j$ or element(y, j)) cnf(c_3, negated_conjecture)
element(y, j) $\Rightarrow$ ($y = j$ or $y = k$) cnf(c_4, negated_conjecture)
(element(y, m) and $f(y) = m$) $\Rightarrow$ $y = m$ cnf(c_5, negated_conjecture)
(element(y, m) and $f(y) = y$) $\Rightarrow$ $y = m$ cnf(c_6, negated_conjecture)
element(y, m) $\Rightarrow$ ($y = m$ or element($y, f(y)$)) cnf(c_7, negated_conjecture)
element(y, m) $\Rightarrow$ ($y = m$ or element($f(y), y$)) cnf(c_8, negated_conjecture)
(element(y, v_1) and element(v_1, y)) $\Rightarrow$ ($y = m$ or element(y, m) or $v_1 = m$ or $v_1 = y$) cnf(c_9, negated_conjecture)
$g(y) = n$ $\Rightarrow$ ($y = n$ or element(y, n)) cnf(c_{10}, negated_conjecture)
$g(y) = y$ $\Rightarrow$ ($y = n$ or element(y, n)) cnf(c_{11}, negated_conjecture)
$y = n$ or element(y, n) or element($y, g(y)$) cnf(c_{12}, negated_conjecture)
$y = n$ or element(y, n) or element($g(y), y$) cnf(c_{13}, negated_conjecture)
(element(y, n) and element(y, v) and element(v, y)) $\Rightarrow$ ($y = n$ or $v = n$ or $v = y$) cnf(c_{14}, negated_conjecture)
$y = m$ $\Rightarrow$ ($y = k$ or element(y, k)) cnf(c_{15}, negated_conjecture)
$y = n$ $\Rightarrow$ ($y = k$ or element(y, k)) cnf(c_{16}, negated_conjecture)
element(y, k) $\Rightarrow$ ($y = k$ or $y = m$ or $y = n$) cnf(c_{17}, negated_conjecture)

SYN014-2.p A problem in quantification theory
$x{=}x$ cnf(reflexivityish, axiom)
$x{=}y$ $\Rightarrow$ $y{=}x$ cnf(symmetryish, axiom)
($x{=}y$ and $y{=}z$) $\Rightarrow$ $x{=}z$ cnf(transitivityish, axiom)
($a{=}b$ and element(c, a)) $\Rightarrow$ element(c, b) cnf(element_substitutionish$_1$, axiom)
(element(a, b) and $a{=}c$) $\Rightarrow$ element(c, b) cnf(element_substitutionish$_2$, axiom)
element(a, a) $\Rightarrow$ ($a{=}k$ or $a{=}a$) cnf(c_3, negated_conjecture)
$a{=}k$ $\Rightarrow$ (element(a, a) or $a{=}a$) cnf(c_4, negated_conjecture)
($f(a){=}m$ and element(a, m)) $\Rightarrow$ $a{=}m$ cnf(c_5, negated_conjecture)
($f(a){=}a$ and element(a, m)) $\Rightarrow$ $a{=}m$ cnf(c_6, negated_conjecture)
element(a, m) $\Rightarrow$ (element($a, f(a)$) or $a{=}m$) cnf(c_7, negated_conjecture)
element(a, m) $\Rightarrow$ (element($f(a), a$) or $a{=}m$) cnf(c_8, negated_conjecture)
(element(a, b) and element(b, a)) $\Rightarrow$ ($a{=}b$ or $a{=}m$ or element(b, m) or $b{=}m$) cnf(c_9, negated_conjecture)
$g(a){=}n$ $\Rightarrow$ (element(a, n) or $a{=}n$) cnf(c_{10}, negated_conjecture)
$g(a){=}a$ $\Rightarrow$ (element(a, n) or $a{=}n$) cnf(c_{11}, negated_conjecture)

element$(a, g(a))$ or element(a, n) or a=n cnf$(c_{12}$, negated_conjecture$)$
element$(g(a), a)$ or element(a, n) or a=n cnf$(c_{13}$, negated_conjecture$)$
(element(a, b) and element(b, a) and element(b, n)) $\Rightarrow$ (a=b or a=n or b=n) cnf$(c_{14}$, negated_conjecture$)$
a=m $\Rightarrow$ (element(a, k) or a=k) cnf$(c_{15}$, negated_conjecture$)$
a=n $\Rightarrow$ (element(a, k) or a=k) cnf$(c_{16}$, negated_conjecture$)$
element(a, k) $\Rightarrow$ (a=n or a=m or a=k) cnf$(c_{17}$, negated_conjecture$)$
$\neg$ n=a cnf$(c_{18}$, negated_conjecture$)$
$\neg$ m=n cnf$(c_{19}$, negated_conjecture$)$
n=k cnf$(c_{20}$, negated_conjecture$)$
$\neg$ m=a cnf$(c_{21}$, negated_conjecture$)$
$\neg$ k=a cnf$(c_{22}$, negated_conjecture$)$
m=k cnf$(c_{23}$, negated_conjecture$)$

SYN015-1.p A problem in quantification theory
$m \neq n$ cnf$(c_1$, negated_conjecture$)$
$y = k$ $\Rightarrow$ ($y = j$ or element(y, j)) cnf$(c_2$, negated_conjecture$)$
element(y, j) $\Rightarrow$ ($y = j$ or $y = k$) cnf$(c_3$, negated_conjecture$)$
(element(y, m) and $f(y) = m$) $\Rightarrow$ $y = m$ cnf$(c_4$, negated_conjecture$)$
(element(y, m) and $f(y) = y$) $\Rightarrow$ $y = m$ cnf$(c_5$, negated_conjecture$)$
element(y, m) $\Rightarrow$ ($y = m$ or element$(y, f(y))$) cnf$(c_6$, negated_conjecture$)$
element(y, m) $\Rightarrow$ ($y = m$ or element$(f(y), y)$) cnf$(c_7$, negated_conjecture$)$
(element(y, v_1) and element(v_1, y)) $\Rightarrow$ ($y = m$ or element(y, m) or $v_1 = m$ or $v_1 = y$) cnf$(c_8$, negated_conjecture$)$
$g(y) = n$ $\Rightarrow$ ($y = n$ or element(y, n)) cnf$(c_9$, negated_conjecture$)$
$g(y) = y$ $\Rightarrow$ ($y = n$ or element(y, n)) cnf$(c_{10}$, negated_conjecture$)$
$y = n$ or element(y, n) or element$(y, g(y))$ cnf$(c_{11}$, negated_conjecture$)$
$y = n$ or element(y, n) or element$(g(y), y)$ cnf$(c_{12}$, negated_conjecture$)$
(element(y, n) and element(y, v) and element(v, y)) $\Rightarrow$ ($y = n$ or $v = n$ or $v = y$) cnf$(c_{13}$, negated_conjecture$)$
$y = m$ $\Rightarrow$ ($y = k$ or element(y, k)) cnf$(c_{14}$, negated_conjecture$)$
$y = n$ $\Rightarrow$ ($y = k$ or element(y, k)) cnf$(c_{15}$, negated_conjecture$)$
element(y, k) $\Rightarrow$ ($y = k$ or $y = m$ or $y = n$) cnf$(c_{16}$, negated_conjecture$)$

SYN015-2.p A problem in quantification theory
x=x cnf(reflexivityish, axiom)
x=y $\Rightarrow$ y=x cnf(symmetryish, axiom)
(x=y and y=z) $\Rightarrow$ x=z cnf(transitivityish, axiom)
(a=b and element(c, a)) $\Rightarrow$ element(c, b) cnf(element_substitutionish$_1$, axiom)
(element(a, b) and a=c) $\Rightarrow$ element(c, b) cnf(element_substitutionish$_2$, axiom)
element(a, a) $\Rightarrow$ (a=k or a=a) cnf$(c_3$, negated_conjecture$)$
a=k $\Rightarrow$ (element(a, a) or a=a) cnf$(c_4$, negated_conjecture$)$
($f(a)$=m and element(a, m)) $\Rightarrow$ a=m cnf$(c_5$, negated_conjecture$)$
($f(a)$=a and element(a, m)) $\Rightarrow$ a=m cnf$(c_6$, negated_conjecture$)$
element(a, m) $\Rightarrow$ (element$(a, f(a))$ or a=m) cnf$(c_7$, negated_conjecture$)$
element(a, m) $\Rightarrow$ (element$(f(a), a)$ or a=m) cnf$(c_8$, negated_conjecture$)$
(element(a, b) and element(b, a)) $\Rightarrow$ (a=b or a=m or element(b, m) or b=m) cnf$(c_9$, negated_conjecture$)$
$g(a)$=n $\Rightarrow$ (element(a, n) or a=n) cnf$(c_{10}$, negated_conjecture$)$
$g(a)$=a $\Rightarrow$ (element(a, n) or a=n) cnf$(c_{11}$, negated_conjecture$)$
element$(a, g(a))$ or element(a, n) or a=n cnf$(c_{12}$, negated_conjecture$)$
element$(g(a), a)$ or element(a, n) or a=n cnf$(c_{13}$, negated_conjecture$)$
(element(a, b) and element(b, a) and element(b, n)) $\Rightarrow$ (a=b or a=n or b=n) cnf$(c_{14}$, negated_conjecture$)$
a=m $\Rightarrow$ (element(a, k) or a=k) cnf$(c_{15}$, negated_conjecture$)$
a=n $\Rightarrow$ (element(a, k) or a=k) cnf$(c_{16}$, negated_conjecture$)$
element(a, k) $\Rightarrow$ (a=n or a=m or a=k) cnf$(c_{17}$, negated_conjecture$)$
$\neg$ n=a cnf$(c_{18}$, negated_conjecture$)$
$\neg$ m=n cnf$(c_{19}$, negated_conjecture$)$
$\neg$ n=k cnf$(c_{20}$, negated_conjecture$)$
$\neg$ m=a cnf$(c_{21}$, negated_conjecture$)$
$\neg$ k=a cnf$(c_{22}$, negated_conjecture$)$
m=k cnf$(c_{23}$, negated_conjecture$)$

SYN028-1.p EW1
q or p cnf(clause$_1$, axiom)

$q \Rightarrow r$ cnf(clause$_2$, axiom)
$r \Rightarrow s$ cnf(clause$_3$, axiom)
$(s \text{ and } r) \Rightarrow t$ cnf(clause$_4$, axiom)
$t \Rightarrow p$ cnf(clause$_5$, axiom)
$\neg p$ cnf(prove_something, negated_conjecture)

SYN029-1.p EW2
q or p cnf(clause$_1$, axiom)
$p \Rightarrow q$ cnf(clause$_2$, axiom)
$(r \text{ and } q) \Rightarrow p$ cnf(clause$_3$, axiom)
r cnf(clause$_4$, axiom)
$p \Rightarrow \neg q$ cnf(prove_something, negated_conjecture)

SYN030-1.p EW3
$(t \text{ and } s) \Rightarrow p$ cnf(clause$_1$, axiom)
$r \Rightarrow s$ cnf(clause$_2$, axiom)
$t \Rightarrow r$ cnf(clause$_3$, axiom)
$(r \text{ and } q) \Rightarrow t$ cnf(clause$_4$, axiom)
$q \Rightarrow r$ cnf(clause$_5$, axiom)
q or r cnf(clause$_6$, axiom)
$r \Rightarrow q$ cnf(clause$_7$, axiom)
$(s \text{ and } p) \Rightarrow q$ cnf(clause$_8$, axiom)
$(p \text{ and } q) \Rightarrow \neg r$ cnf(theorem, negated_conjecture)

SYN031-1.p MQW
$g(a,a)$ or $g(f(a),a)$ cnf(clause$_1$, axiom)
$g(a,a)$ or $g(a,f(a))$ cnf(clause$_2$, axiom)
$g(a,b) \Rightarrow g(f(b),b)$ cnf(clause$_3$, axiom)
$g(a,b) \Rightarrow g(b,f(b))$ cnf(clause$_4$, axiom)
$g(a,b) \Rightarrow \neg g(b,a)$ cnf(theorem, negated_conjecture)

SYN032-1.p Ances
$j \Rightarrow (h \text{ or } a)$ cnf(three, hypothesis)
h or k or j cnf(four, hypothesis)
$k \Rightarrow (h \text{ or } j)$ cnf(five, hypothesis)
$a \Rightarrow b$ cnf(six, hypothesis)
$h \Rightarrow c$ cnf(seven, hypothesis)
$h \Rightarrow \neg c$ cnf(one, hypothesis)
$a \Rightarrow \neg b$ cnf(prove_something, negated_conjecture)

SYN033-1.p DM
$p(g(a,b),a,b)$ cnf(clause$_1$, axiom)
$p(a,h(a,b),b)$ cnf(clause$_2$, axiom)
$(p(a,b,c) \text{ and } p(d,e,b) \text{ and } p(a,d,f)) \Rightarrow p(f,e,c)$ cnf(clause$_3$, axiom)
$\neg p(k(a),a,k(a))$ cnf(prove_something, negated_conjecture)

SYN034-1.p QW
$p(a,a)$ or $p(a,f(a))$ cnf(clause$_1$, axiom)
$p(a,a)$ or $p(f(a),a)$ cnf(clause$_2$, axiom)
$(p(a,b) \text{ and } p(b,a)) \Rightarrow \neg p(b,a)$ cnf(theorem, negated_conjecture)

SYN035-1.p ROB1
$p(a,b)$ cnf(clause$_1$, axiom)
$(p(f(a,b),f(a,b)) \text{ and } p(b,f(a,b))) \Rightarrow q(a,b)$ cnf(clause$_2$, axiom)
$(q(f(a,b),f(a,b)) \text{ and } q(a,f(a,b)) \text{ and } p(f(a,b),f(a,b))) \Rightarrow \neg p(b,f(a,b))$ cnf(theorem, negated_conjecture)

SYN036+1.p Andrews Challenge Problem
$(\exists x\colon \forall y\colon (\text{big\_p}(x) \iff \text{big\_p}(y)) \iff (\exists u\colon \text{big\_q}(u) \iff \forall w\colon \text{big\_q}(w))) \iff (\exists x_1\colon \forall y_1\colon (\text{big\_q}(x_1) \iff \text{big\_q}(y_1)) \iff (\exists u_1\colon \text{big\_p}(u_1) \iff \forall w_1\colon \text{big\_p}(w_1)))$ fof(pel$_{34}$, conjecture)

SYN036+2.p Andrews Challenge Problem
$(\exists x\colon \forall y\colon (\text{big\_p}(x) \iff \text{big\_p}(y)) \iff (\exists u\colon \text{big\_q}(u) \iff \forall w\colon \text{big\_p}(w))) \iff (\exists x_1\colon \forall y_1\colon (\text{big\_q}(x_1) \iff \text{big\_q}(y_1)) \iff (\exists u_1\colon \text{big\_p}(u_1) \iff \forall w_1\colon \text{big\_q}(w_1)))$ fof(pel$_{34}$, conjecture)

SYN036-3.p Andrews Challenge Problem

$(n_2$ and n_9 and $n_6) \Rightarrow \neg\, n_{10}$ cnf(clause$_1$, negated_conjecture)
$(n_2$ and $n_9) \Rightarrow (n_6$ or $n_{10})$ cnf(clause$_2$, negated_conjecture)
$(n_6$ and $n_{10}) \Rightarrow (n_2$ or $n_9)$ cnf(clause$_3$, negated_conjecture)
n_2 or n_9 or n_6 or n_{10} cnf(clause$_4$, negated_conjecture)
$(n_2$ and $n_6) \Rightarrow (n_9$ or $n_{10})$ cnf(clause$_5$, negated_conjecture)
$(n_2$ and $n_{10}) \Rightarrow (n_9$ or $n_6)$ cnf(clause$_6$, negated_conjecture)
$(n_9$ and $n_6) \Rightarrow (n_2$ or $n_{10})$ cnf(clause$_7$, negated_conjecture)
$(n_9$ and $n_{10}) \Rightarrow (n_2$ or $n_6)$ cnf(clause$_8$, negated_conjecture)
$p(s_8) \Rightarrow n_8$ cnf(clause$_9$, negated_conjecture)
$n_8 \Rightarrow p(x_8)$ cnf(clause$_{10}$, negated_conjecture)
$p(x_7) \Rightarrow n_7$ cnf(clause$_{11}$, negated_conjecture)
$n_7 \Rightarrow p(s_7)$ cnf(clause$_{12}$, negated_conjecture)
$n_5(x_6) \Rightarrow n_6$ cnf(clause$_{13}$, negated_conjecture)
$n_6 \Rightarrow n_5(s_6)$ cnf(clause$_{14}$, negated_conjecture)
$(q(x)$ and $q(s_5(x))) \Rightarrow n_5(x)$ cnf(clause$_{15}$, negated_conjecture)
$q(x)$ or $q(s_5(x))$ or $n_5(x)$ cnf(clause$_{16}$, negated_conjecture)
$(n_5(x)$ and $q(x)) \Rightarrow q(x_5)$ cnf(clause$_{17}$, negated_conjecture)
$(n_5(x)$ and $q(x_5)) \Rightarrow q(x)$ cnf(clause$_{18}$, negated_conjecture)
$q(s_4) \Rightarrow n_4$ cnf(clause$_{19}$, negated_conjecture)
$n_4 \Rightarrow q(x_4)$ cnf(clause$_{20}$, negated_conjecture)
$q(x_3) \Rightarrow n_3$ cnf(clause$_{21}$, negated_conjecture)
$n_3 \Rightarrow q(s_3)$ cnf(clause$_{22}$, negated_conjecture)
$n_1(x_2) \Rightarrow n_2$ cnf(clause$_{23}$, negated_conjecture)
$n_2 \Rightarrow n_1(s_2)$ cnf(clause$_{24}$, negated_conjecture)
$(p(x)$ and $p(s_1(x))) \Rightarrow n_1(x)$ cnf(clause$_{25}$, negated_conjecture)
$p(x)$ or $p(s_1(x))$ or $n_1(x)$ cnf(clause$_{26}$, negated_conjecture)
$(n_1(x)$ and $p(x)) \Rightarrow p(x_1)$ cnf(clause$_{27}$, negated_conjecture)
$(n_1(x)$ and $p(x_1)) \Rightarrow p(x)$ cnf(clause$_{28}$, negated_conjecture)
$(n_3$ and $n_4) \Rightarrow n_9$ cnf(clause$_{29}$, negated_conjecture)
n_3 or n_4 or n_9 cnf(clause$_{30}$, negated_conjecture)
$(n_3$ and $n_9) \Rightarrow n_4$ cnf(clause$_{31}$, negated_conjecture)
$(n_4$ and $n_9) \Rightarrow n_3$ cnf(clause$_{32}$, negated_conjecture)
$(n_7$ and $n_8) \Rightarrow n_{10}$ cnf(clause$_{33}$, negated_conjecture)
n_7 or n_8 or n_{10} cnf(clause$_{34}$, negated_conjecture)
$(n_7$ and $n_{10}) \Rightarrow n_8$ cnf(clause$_{35}$, negated_conjecture)
$(n_8$ and $n_{10}) \Rightarrow n_7$ cnf(clause$_{36}$, negated_conjecture)

SYN036∧5.p TPS problem X2129
cQ: $i → $o thf(cQ, type)
cP: $i → $o thf(cP, type)
(∃xx: $i: ∀xy: $i: ((cP@xx) ⟺ (cP@xy)) ⟺ (∃xx: $i: (cQ@xx) ⟺ ∀xy: $i: (cP@xy))) ⟺ (∃xx: $i: ∀xy: $i: ((cQ@xx
(cQ@xy)) ⟺ (∃xx: $i: (cP@xx) ⟺ ∀xy: $i: (cQ@xy))) thf(cX$_{2129}$, conjecture)

SYN037-1.p Andrews Challenge Problem Variant
$(n_2$ and n_9 and $n_6) \Rightarrow \neg\, n_{10}$ cnf(clause$_1$, negated_conjecture)
$(n_2$ and $n_9) \Rightarrow (n_6$ or $n_{10})$ cnf(clause$_2$, negated_conjecture)
$(n_6$ and $n_{10}) \Rightarrow (n_2$ or $n_9)$ cnf(clause$_3$, negated_conjecture)
n_2 or n_9 or n_6 or n_{10} cnf(clause$_4$, negated_conjecture)
$(n_2$ and $n_6) \Rightarrow (n_9$ or $n_{10})$ cnf(clause$_5$, negated_conjecture)
$(n_2$ and $n_{10}) \Rightarrow (n_9$ or $n_6)$ cnf(clause$_6$, negated_conjecture)
$(n_9$ and $n_6) \Rightarrow (n_2$ or $n_{10})$ cnf(clause$_7$, negated_conjecture)
$(n_9$ and $n_{10}) \Rightarrow (n_2$ or $n_6)$ cnf(clause$_8$, negated_conjecture)
$q(s_8) \Rightarrow n_8$ cnf(clause$_9$, negated_conjecture)
$n_8 \Rightarrow q(x_{10})$ cnf(clause$_{10}$, negated_conjecture)
$p(x_9) \Rightarrow n_7$ cnf(clause$_{11}$, negated_conjecture)
$n_7 \Rightarrow p(s_7)$ cnf(clause$_{12}$, negated_conjecture)
$n_5(x_8) \Rightarrow n_6$ cnf(clause$_{13}$, negated_conjecture)
$n_6 \Rightarrow n_5(s_6)$ cnf(clause$_{14}$, negated_conjecture)
$(q(s_5(w))$ and $q(w)) \Rightarrow n_5(w)$ cnf(clause$_{15}$, negated_conjecture)
$q(s_5(w))$ or $q(w)$ or $n_5(w)$ cnf(clause$_{16}$, negated_conjecture)

$(n_5(w)$ and $q(x_7)) \Rightarrow q(w)$ cnf(clause$_{17}$, negated_conjecture)
$(n_5(w)$ and $q(w)) \Rightarrow q(x_7)$ cnf(clause$_{18}$, negated_conjecture)
$p(s_4) \Rightarrow n_4$ cnf(clause$_{19}$, negated_conjecture)
$n_4 \Rightarrow p(x_6)$ cnf(clause$_{20}$, negated_conjecture)
$q(x_5) \Rightarrow n_3$ cnf(clause$_{21}$, negated_conjecture)
$n_3 \Rightarrow q(s_3)$ cnf(clause$_{22}$, negated_conjecture)
$n_1(x_4) \Rightarrow n_2$ cnf(clause$_{23}$, negated_conjecture)
$n_2 \Rightarrow n_1(s_2)$ cnf(clause$_{24}$, negated_conjecture)
$(p(x)$ and $p(s_1(x))) \Rightarrow n_1(x)$ cnf(clause$_{25}$, negated_conjecture)
$p(x)$ or $p(s_1(x))$ or $n_1(x)$ cnf(clause$_{26}$, negated_conjecture)
$(n_1(x)$ and $p(x)) \Rightarrow p(x_3)$ cnf(clause$_{27}$, negated_conjecture)
$(n_1(x)$ and $p(x_3)) \Rightarrow p(x)$ cnf(clause$_{28}$, negated_conjecture)
$(n_3$ and $n_4) \Rightarrow n_9$ cnf(clause$_{29}$, negated_conjecture)
n_3 or n_4 or n_9 cnf(clause$_{30}$, negated_conjecture)
$(n_3$ and $n_9) \Rightarrow n_4$ cnf(clause$_{31}$, negated_conjecture)
$(n_4$ and $n_9) \Rightarrow n_3$ cnf(clause$_{32}$, negated_conjecture)
$(n_7$ and $n_8) \Rightarrow n_{10}$ cnf(clause$_{33}$, negated_conjecture)
n_7 or n_8 or n_{10} cnf(clause$_{34}$, negated_conjecture)
$(n_7$ and $n_{10}) \Rightarrow n_8$ cnf(clause$_{35}$, negated_conjecture)
$(n_8$ and $n_{10}) \Rightarrow n_7$ cnf(clause$_{36}$, negated_conjecture)

SYN037-2.p Andrews Challenge Problem Variant
$(m_1$ and m_3 and $p(x_1)) \Rightarrow \neg p(\mathrm{fy}(x_1))$ cnf(clause$_1$, negated_conjecture)
$(m_1$ and $m_3) \Rightarrow (p(x_1)$ or $p(\mathrm{fy}(x_1)))$ cnf(clause$_2$, negated_conjecture)
$(m_1$ and $p(\mathrm{cx})) \Rightarrow (m_3$ or $p(y_4))$ cnf(clause$_3$, negated_conjecture)
$(m_1$ and $p(y_5)) \Rightarrow (m_3$ or $p(\mathrm{cx}))$ cnf(clause$_4$, negated_conjecture)
$(m_2$ and m_3 and $q(\mathrm{cw})) \Rightarrow q(z_1)$ cnf(clause$_5$, negated_conjecture)
$(m_2$ and m_3 and $q(z)) \Rightarrow q(\mathrm{cw})$ cnf(clause$_6$, negated_conjecture)
$(m_2$ and $q(w_2)$ and $q(\mathrm{fz}_5(w_2))) \Rightarrow m_3$ cnf(clause$_7$, negated_conjecture)
$m_2 \Rightarrow (m_3$ or $q(w_2)$ or $q(\mathrm{fz}_5(w_2)))$ cnf(clause$_8$, negated_conjecture)
$(m_3$ and $p(\mathrm{cx})) \Rightarrow (m_1$ or $p(y_1))$ cnf(clause$_9$, negated_conjecture)
$(m_3$ and $p(y_2)) \Rightarrow (m_1$ or $p(\mathrm{cx}))$ cnf(clause$_{10}$, negated_conjecture)
$(m_3$ and $q(w_1)$ and $q(\mathrm{fz}_2(w_1))) \Rightarrow m_2$ cnf(clause$_{11}$, negated_conjecture)
$m_3 \Rightarrow (m_2$ or $q(w_1)$ or $q(\mathrm{fz}_2(w_1)))$ cnf(clause$_{12}$, negated_conjecture)
$(p(x_2)$ and $p(\mathrm{fy}_3(x_2))) \Rightarrow (m_1$ or $m_3)$ cnf(clause$_{13}$, negated_conjecture)
$q(\mathrm{cw}) \Rightarrow (m_2$ or m_3 or $q(z_4))$ cnf(clause$_{14}$, negated_conjecture)
$q(z_3) \Rightarrow (m_2$ or m_3 or $q(\mathrm{cw}))$ cnf(clause$_{15}$, negated_conjecture)
m_1 or m_3 or $p(x_2)$ or $p(\mathrm{fy}_3(x_2))$ cnf(clause$_{16}$, negated_conjecture)
$(m_1$ and $q(u_1)) \Rightarrow q(\mathrm{uu}_1)$ cnf(clause$_{17}$, negated_conjecture)
$(m_2$ and $p(v_1)) \Rightarrow p(\mathrm{vv}_1)$ cnf(clause$_{18}$, negated_conjecture)
$p(\mathrm{cvv}) \Rightarrow m_2$ cnf(clause$_{19}$, negated_conjecture)
$q(\mathrm{cuu}) \Rightarrow m_1$ cnf(clause$_{20}$, negated_conjecture)
m_2 or $p(\mathrm{cv})$ cnf(clause$_{21}$, negated_conjecture)
m_1 or $q(\mathrm{cu})$ cnf(clause$_{22}$, negated_conjecture)

SYN038-1.p Syntactic formula
Exists X, Exists Y, All Z (((p(X,Y) → (p(X,Z) <→ q(Y,Z))) & (p(X,Y) <→ (p(Z,Z) → q(Z,Z)))) → (q(Z,Y) <→ q(Z,Z)))
$(p(x, f(x, y))$ and $p(x, y)) \Rightarrow q(y, f(x, y))$ cnf(clause$_1$, negated_conjecture)
$(p(x, y)$ and $q(y, f(x, y))) \Rightarrow p(x, f(x, y))$ cnf(clause$_2$, negated_conjecture)
$(p(x, y)$ and $p(f(x, y), f(x, y))) \Rightarrow q(f(x, y), f(x, y))$ cnf(clause$_3$, negated_conjecture)
$p(x, y)$ or $p(f(x, y), f(x, y))$ cnf(clause$_4$, negated_conjecture)
$q(f(x, y), f(x, y)) \Rightarrow p(x, y)$ cnf(clause$_5$, negated_conjecture)
$q(x, y)$ or $q(f(x, y), f(x, y))$ cnf(clause$_6$, negated_conjecture)
$q(x, y) \Rightarrow \neg q(f(x, y), f(x, y))$ cnf(clause$_7$, negated_conjecture)

SYN039-1.p A challenge to resolution programs
$(s(x, f_1(x, x_1))$ and $q(x_1, f_1(x, x_1))) \Rightarrow p(f_1(x, x_1), f_1(x, x_1))$ cnf(c_1, negated_conjecture)
$s(x, f_1(x, x_1)) \Rightarrow (p(f_1(x, x_1), f_1(x, x_1))$ or $q(f_1(x, x_1), z_1))$ cnf(c_2, negated_conjecture)
$(s(x, f_1(x, x_1))$ and $s(x_1, x_1)) \Rightarrow p(f_1(x, x_1), f_1(x, x_1))$ cnf(c_3, negated_conjecture)
$q(x_1, f_1(x, x_1)) \Rightarrow (p(f_1(x, x_1), f_1(x, x_1))$ or $s(f_1(x, x_1), z))$ cnf(c_4, negated_conjecture)

$p(f_1(x,x_1),f_1(x,x_1))$ or $s(f_1(x,x_1),z)$ or $q(f_1(x,x_1),z_1)$ cnf(c_5, negated_conjecture)
$s(x_1,x_1) \Rightarrow (p(f_1(x,x_1),f_1(x,x_1))$ or $s(f_1(x,x_1),z))$ cnf(c_6, negated_conjecture)
$(q(z_1,z_1)$ and $q(x_1,f_1(x,x_1))) \Rightarrow p(f_1(x,x_1),f_1(x,x_1))$ cnf(c_7, negated_conjecture)
$q(z_1,z_1) \Rightarrow (p(f_1(x,x_1),f_1(x,x_1))$ or $q(f_1(x,x_1),z_1))$ cnf(c_8, negated_conjecture)
$(q(z_1,z_1)$ and $s(x_1,x_1)) \Rightarrow p(f_1(x,x_1),f_1(x,x_1))$ cnf(c_9, negated_conjecture)
$(p(x,x)$ and $s(x,f_1(x,x_1))) \Rightarrow \neg\, q(x_1,f_1(x,x_1))$ cnf(c_{10}, negated_conjecture)
$(p(x,x)$ and $s(x,f_1(x,x_1))) \Rightarrow q(f_1(x,x_1),z_1)$ cnf(c_{11}, negated_conjecture)
$(p(x,x)$ and $s(x,f_1(x,x_1))) \Rightarrow \neg\, s(x_1,x_1)$ cnf(c_{12}, negated_conjecture)
$(p(x,x)$ and $q(x_1,f_1(x,x_1))) \Rightarrow s(f_1(x,x_1),z)$ cnf(c_{13}, negated_conjecture)
$p(x,x) \Rightarrow (s(f_1(x,x_1),z)$ or $q(f_1(x,x_1),z_1))$ cnf(c_{14}, negated_conjecture)
$(p(x,x)$ and $s(x_1,x_1)) \Rightarrow s(f_1(x,x_1),z)$ cnf(c_{15}, negated_conjecture)
$(p(x,x)$ and $q(z_1,z_1)) \Rightarrow \neg\, q(x_1,f_1(x,x_1))$ cnf(c_{16}, negated_conjecture)
$(p(x,x)$ and $q(z_1,z_1)) \Rightarrow q(f_1(x,x_1),z_1)$ cnf(c_{17}, negated_conjecture)
$(p(x,x)$ and $q(z_1,z_1)) \Rightarrow \neg\, s(x_1,x_1)$ cnf(c_{18}, negated_conjecture)
$(s(x,f_1(x,x_1))$ and $q(x_1,f_1(x,x_1))) \Rightarrow s(z,x)$ cnf(c_{19}, negated_conjecture)
$s(x,f_1(x,x_1)) \Rightarrow (s(z,x)$ or $q(f_1(x,x_1),z_1))$ cnf(c_{20}, negated_conjecture)
$(s(x,f_1(x,x_1))$ and $s(x_1,x_1)) \Rightarrow s(z,x)$ cnf(c_{21}, negated_conjecture)
$q(x_1,f_1(x,x_1)) \Rightarrow (s(z,x)$ or $s(f_1(x,x_1),z))$ cnf(c_{22}, negated_conjecture)
$s(z,x)$ or $s(f_1(x,x_1),z)$ or $q(f_1(x,x_1),z_1)$ cnf(c_{23}, negated_conjecture)
$s(x_1,x_1) \Rightarrow (s(z,x)$ or $s(f_1(x,x_1),z))$ cnf(c_{24}, negated_conjecture)
$(q(z_1,z_1)$ and $q(x_1,f_1(x,x_1))) \Rightarrow s(z,x)$ cnf(c_{25}, negated_conjecture)
$q(z_1,z_1) \Rightarrow (s(z,x)$ or $q(f_1(x,x_1),z_1))$ cnf(c_{26}, negated_conjecture)
$(q(z_1,z_1)$ and $s(x_1,x_1)) \Rightarrow s(z,x)$ cnf(c_{27}, negated_conjecture)

SYN040+1.p Pelletier Problem 1
A biconditional version of the 'most difficult' theorem proved by the original Logic Theorist.
$(p \Rightarrow q) \iff (\neg\, q \Rightarrow \neg\, p)$ fof(pel$_1$, conjecture)

SYN040-1.p Pelletier Problem 1
A biconditional version of the 'most difficult' theorem proved by the original Logic Theorist.
$p \Rightarrow q$ cnf(clause$_1$, negated_conjecture)
$q \Rightarrow p$ cnf(clause$_2$, negated_conjecture)
$\neg\, q$ cnf(clause$_3$, negated_conjecture)
p cnf(clause$_4$, negated_conjecture)

SYN040∧4.p Pelletier Problem 1
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
q: $i → $o thf(q_type, type)
ivalid@(iequiv@(iimplies@(iatom@p)@(iatom@q))@(iimplies@(inot@(iatom@q))@(inot@(iatom@p)))) thf(pel$_1$, conjecture

SYN041+1.p Pelletier Problem 3
3: The hardest theorem proved by a breadth-first logic theorist.
$\neg\, p \Rightarrow q \Rightarrow (q \Rightarrow p)$ fof(pel$_3$, conjecture)

SYN041-1.p Pelletier Problem 3, 16
3: The hardest theorm proved by a breadth-first logic theorist. 16:A surprising theorem of propositional logic.
p cnf(clause$_1$, negated_conjecture)
$\neg\, q$ cnf(clause$_2$, negated_conjecture)
q cnf(clause$_3$, negated_conjecture)
$\neg\, p$ cnf(clause$_4$, negated_conjecture)

SYN041∧4.p Pelletier Problem 3
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
q: $i → $o thf(q_type, type)
ivalid@(iimplies@(inot@(iimplies@(iatom@p)@(iatom@q)))@(iimplies@(iatom@q)@(iatom@p))) thf(pel$_3$, conjecture)

SYN044+1.p Pelletier Problem 10
A reasonably simple probloem designed to see whether 'natural' systems correctly manipulate premises.
$q \Rightarrow r$ fof(pel10$_1$, axiom)
$r \Rightarrow (p$ and $q)$ fof(pel10$_2$, axiom)
$p \Rightarrow (q$ or $r)$ fof(pel10$_3$, axiom)

$p \iff q$ fof(pel_{10}, conjecture)

SYN044-1.p Pelletier Problem 10
A reasonably simple probloem designed to see whether 'natural' systems correctly manipulate premises.
$q \Rightarrow r$ cnf(clause_1, axiom)
$r \Rightarrow p$ cnf(clause_2, axiom)
$r \Rightarrow q$ cnf(clause_3, axiom)
$p \Rightarrow (q \text{ or } r)$ cnf(clause_4, axiom)
$p \Rightarrow \neg q$ cnf(clause_5, negated_conjecture)
p or q cnf(clause_6, negated_conjecture)

SYN044^4.p Pelletier Problem 10
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
q: $i → $o thf(q_type, type)
r: $i → $o thf(r_type, type)
ivalid@(iimplies@(iatom@q)@(iatom@r)) thf(pel10_1, axiom)
ivalid@(iimplies@(iatom@r)@(iand@(iatom@p)@(iatom@q))) thf(pel10_2, axiom)
ivalid@(iimplies@(iatom@p)@(ior@(iatom@q)@(iatom@r))) thf(pel10_3, axiom)
ivalid@(iequiv@(iatom@p)@(iatom@q)) thf(pel_{10}, conjecture)

SYN045+1.p Pelletier Problem 13
$(p \text{ or } (q \text{ and } r)) \iff ((p \text{ or } q) \text{ and } (p \text{ or } r))$ fof(pel_{13}, conjecture)

SYN045-1.p Pelletier Problem 13
p or q cnf(clause_1, negated_conjecture)
p or r cnf(clause_2, negated_conjecture)
$\neg p$ cnf(clause_3, negated_conjecture)
$q \Rightarrow \neg r$ cnf(clause_4, negated_conjecture)

SYN045^4.p Pelletier Problem 13
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
q: $i → $o thf(q_type, type)
r: $i → $o thf(r_type, type)
ivalid@(iequiv@(ior@(iatom@p)@(iand@(iatom@q)@(iatom@r)))@(iand@(ior@(iatom@p)@(iatom@q))@(ior@(iatom@p)@(ia

SYN045^7.p Pelletier Problem 13
include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')
r: $i → $o thf(r_type, type)
q: $i → $o thf(q_type, type)
p: $i → $o thf(p_type, type)
mvalid@(mand@(mbox_s4@(mimplies@(mor@(mbox_s4@p)@(mand@(mbox_s4@q)@(mbox_s4@r)))@(mand@(mor@(mbox_s4@

SYN046+1.p Pelletier Problem 15
$(p \Rightarrow q) \iff (\neg p \text{ or } q)$ fof(pel_{15}, conjecture)

SYN046-1.p Pelletier Problem 15
$p \Rightarrow q$ cnf(clause_1, negated_conjecture)
p cnf(clause_2, negated_conjecture)
$\neg q$ cnf(clause_3, negated_conjecture)

SYN046^4.p Pelletier Problem 15
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
q: $i → $o thf(q_type, type)
ivalid@(iequiv@(iimplies@(iatom@p)@(iatom@q))@(ior@(inot@(iatom@p))@(iatom@q))) thf(pel_{15}, conjecture)

SYN047+1.p Pelletier Problem 17
A problem which appears to not be provable by [BBH72]. For details of why not, see [Pel82] p.135f.
$((p \text{ and } (q \Rightarrow r)) \Rightarrow s) \iff ((\neg p \text{ or } q \text{ or } s) \text{ and } (\neg p \text{ or } \neg r \text{ or } s))$ fof(pel_{17}, conjecture)

SYN047-1.p Pelletier Problem 17
A problem which appears to not be provable by [BBH72]. For details of why not, see [Pel82] p.135f.

p cnf(clause$_1$, negated_conjecture)
$p \Rightarrow (q \text{ or } s)$ cnf(clause$_2$, negated_conjecture)
$(p \text{ and } r) \Rightarrow s$ cnf(clause$_3$, negated_conjecture)
$\neg\, s$ cnf(clause$_4$, negated_conjecture)
$q \Rightarrow r$ cnf(clause$_5$, negated_conjecture)

SYN047∧4.p Pelletier Problem 17
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
q: $i → $o thf(q_type, type)
r: $i → $o thf(r_type, type)
s: $i → $o thf(s_type, type)
ivalid@(iequiv@(iimplies@(iand@(iatom@p)@(iimplies@(iatom@q)@(iatom@r)))@(iatom@s))@(iand@(ior@(inot@(iatom@p)

SYN048+1.p Pelletier Problem 18
$\exists y$: $\forall x$: (big_f(y) $\Rightarrow$ big_f(x)) fof(pel$_{18}$, conjecture)

SYN048-1.p Pelletier Problem 18
big_f(x) cnf(clause$_1$, negated_conjecture)
$\neg$ big_f($f(x)$) cnf(clause$_2$, negated_conjecture)

SYN049+1.p Pelletier Problem 19
$\exists x$: $\forall y, z$: ((big_p(y) $\Rightarrow$ big_q(z)) $\Rightarrow$ (big_p(x) $\Rightarrow$ big_q(x))) fof(pel$_{19}$, conjecture)

SYN049-1.p Pelletier Problem 19
big_p($f(x)$) $\Rightarrow$ big_q($g(x)$) cnf(clause$_1$, negated_conjecture)
big_p(x) cnf(clause$_2$, negated_conjecture)
$\neg$ big_q(x) cnf(clause$_3$, negated_conjecture)

SYN049∧5.p TPS problem PELL19
cQ: $i → $o thf(cQ, type)
cP: $i → $o thf(cP, type)
∃xx: $i: ∀xy: $i, xz: $i: (((cP@xy) ⇒ (cQ@xz)) ⇒ ((cP@xx) ⇒ (cQ@xx))) thf(cPELL$_{19}$, conjecture)

SYN050+1.p Pelletier Problem 20
$\forall x, y$: $\exists z$: $\forall w$: ((big_p(x) and big_q(y)) $\Rightarrow$ (big_r(z) and big_s(w))) $\Rightarrow$ $\exists x_1, y_1$: ((big_p(x_1) and big_q(y_1)) $\Rightarrow$ $\exists z_1$: big_r(z_1)) fof(pel$_{20}$, conjecture)

SYN050-1.p Pelletier Problem 20
(big_p(y) and big_q(z)) $\Rightarrow$ big_r($f(y, z)$) cnf(clause$_1$, negated_conjecture)
(big_p(y) and big_q(z)) $\Rightarrow$ big_s(x) cnf(clause$_2$, negated_conjecture)
big_p(a) cnf(clause$_3$, negated_conjecture)
big_q(b) cnf(clause$_4$, negated_conjecture)
$\neg$ big_r(w) cnf(clause$_5$, negated_conjecture)

SYN051+1.p Pelletier Problem 21
A moderately tricky problem, especially for 'natural' systems with 'strong' restrictions on variables generated from existential quantifiers.
$\exists x$: ($p \Rightarrow$ big_f(x)) fof(pel21$_1$, axiom)
$\exists x$: (big_f(x) $\Rightarrow$ p) fof(pel21$_2$, axiom)
$\exists x$: ($p \iff$ big_f(x)) fof(pel$_{21}$, conjecture)

SYN051-1.p Pelletier Problem 21
A moderately tricky problem, especially for 'natural' systems with 'strong' restrictions on variables generated from existential quantifiers.
$p \Rightarrow$ big_f(a) cnf(clause$_1$, axiom)
big_f(b) $\Rightarrow$ p cnf(clause$_2$, axiom)
p or big_f(x) cnf(clause$_3$, negated_conjecture)
big_f(x) $\Rightarrow \neg\, p$ cnf(clause$_4$, negated_conjecture)

SYN051∧5.p TPS problem PELL21
p: $o thf($p$, type)
cF: $i → $o thf(cF, type)
(∃xx: $i: ($p$ ⇒ (cF@xx)) and ∃xx: $i: ((cF@xx) ⇒ p)) ⇒ ∃xx: $i: (($p$ ⇒ (cF@xx)) and ((cF@xx) ⇒ p)) thf(cPELL$_{21}$, conjecture)

SYN052+1.p Pelletier Problem 22

$\forall x$: $(p \iff \text{big\_f}(x)) \Rightarrow (p \iff \forall x_1\text{: big\_f}(x_1))$ fof(pel_{22}, conjecture)

SYN052-1.p Pelletier Problem 22
$\text{big\_f}(x) \Rightarrow p$ cnf(clause_1, negated_conjecture)
$p \Rightarrow \text{big\_f}(x)$ cnf(clause_2, negated_conjecture)
$\text{big\_f}(y)$ or p cnf(clause_3, negated_conjecture)
$p \Rightarrow \neg\,\text{big\_f}(a)$ cnf(clause_4, negated_conjecture)
$\text{big\_f}(a) \Rightarrow \text{big\_f}(y)$ cnf(clause_5, negated_conjecture)

SYN052^7.p Pelletier Problem 22
include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')
p: $i → $o thf(p_type, type)
big_f: mu → $i → $o thf(big_f_type, type)
mvalid@(mbox_s4@(mimplies@(mbox_s4@(mforall_ind@λx: mu: (mand@(mbox_s4@(mimplies@(mbox_s4@p)@(mbox_s4@(big

SYN053+1.p Pelletier Problem 23
$\forall x$: (p or $\text{big\_f}(x)$) $\iff$ (p or $\forall x_1\text{: big\_f}(x_1)$) fof($\text{pel}_{23}$, conjecture)

SYN053-1.p Pelletier Problem 23
p or $\text{big\_f}(x)$ or $\text{big\_f}(y)$ cnf(clause_1, negated_conjecture)
p or $\text{big\_f}(x)$ or $\text{big\_f}(b)$ cnf(clause_2, negated_conjecture)
$\neg\, p$ cnf(clause_3, negated_conjecture)
$\text{big\_f}(a) \Rightarrow (p \text{ or } \text{big\_f}(y))$ cnf(clause_4, negated_conjecture)
$\text{big\_f}(a) \Rightarrow \neg\,\text{big\_f}(b)$ cnf(clause_5, negated_conjecture)

SYN054+1.p Pelletier Problem 24
$\neg\,\exists x$: ($\text{big\_s}(x)$ and $\text{big\_q}(x)$) fof(pel24_1, axiom)
$\forall x$: ($\text{big\_p}(x) \Rightarrow (\text{big\_q}(x)$ or $\text{big\_r}(x))$) fof(pel24_2, axiom)
$\neg\,\exists x$: $\text{big\_p}(x) \Rightarrow \exists y$: $\text{big\_q}(y)$ fof(pel24_3, axiom)
$\forall x$: (($\text{big\_q}(x)$ or $\text{big\_r}(x)$) $\Rightarrow$ $\text{big\_s}(x)$) fof(pel24_4, axiom)
$\exists x$: ($\text{big\_p}(x)$ and $\text{big\_r}(x)$) fof(pel_{24}, conjecture)

SYN054-1.p Pelletier Problem 24
$\text{big\_s}(x) \Rightarrow \neg\,\text{big\_q}(x)$ cnf(clause_1, axiom)
$\text{big\_p}(x) \Rightarrow (\text{big\_q}(x)$ or $\text{big\_r}(x))$ cnf(clause_2, axiom)
$\text{big\_p}(a)$ or $\text{big\_q}(b)$ cnf(clause_3, axiom)
$\text{big\_q}(x) \Rightarrow \text{big\_s}(x)$ cnf(clause_4, axiom)
$\text{big\_r}(x) \Rightarrow \text{big\_s}(x)$ cnf(clause_5, negated_conjecture)
$\text{big\_p}(x) \Rightarrow \neg\,\text{big\_r}(x)$ cnf(clause_6, negated_conjecture)

SYN055+1.p Pelletier Problem 25
$\exists x$: $\text{big\_p}(x)$ fof(pel25_1, axiom)
$\forall x$: ($\text{big\_f}(x) \Rightarrow (\neg\,\text{big\_g}(x)$ and $\text{big\_r}(x))$) fof(pel25_2, axiom)
$\forall x$: ($\text{big\_p}(x) \Rightarrow (\text{big\_g}(x)$ and $\text{big\_f}(x))$) fof(pel25_3, axiom)
$\forall x$: ($\text{big\_p}(x) \Rightarrow \text{big\_q}(x)$) or $\exists z$: ($\text{big\_p}(z)$ and $\text{big\_r}(z)$) fof(pel25_4, axiom)
$\exists x$: ($\text{big\_q}(x)$ and $\text{big\_p}(x)$) fof(pel_{25}, conjecture)

SYN055-1.p Pelletier Problem 25
$\text{big\_p}(a)$ cnf(clause_1, axiom)
($\text{big\_f}(x)$ and $\text{big\_g}(x)$) $\Rightarrow \neg\,\text{big\_r}(x)$ cnf(clause_2, axiom)
$\text{big\_p}(x) \Rightarrow \text{big\_f}(x)$ cnf(clause_3, axiom)
$\text{big\_p}(x) \Rightarrow \text{big\_g}(x)$ cnf(clause_4, axiom)
$\text{big\_p}(x) \Rightarrow (\text{big\_q}(x)$ or $\text{big\_p}(b))$ cnf(clause_5, axiom)
$\text{big\_p}(x) \Rightarrow (\text{big\_q}(x)$ or $\text{big\_r}(b))$ cnf(clause_6, negated_conjecture)
$\text{big\_q}(x) \Rightarrow \neg\,\text{big\_p}(x)$ cnf(clause_7, negated_conjecture)

SYN055^5.p TPS problem PELL25
cP: $i → $o thf(cP, type)
cQ: $i → $o thf(cQ, type)
cR: $i → $o thf(cR, type)
cF: $i → $o thf(cF, type)
cG: $i → $o thf(cG, type)

(∃xx: $i: (cP@xx) and ∀xx: $i: ((cF@xx) ⇒ (¬ cG@xx and cR@xx)) and ∀xx: $i: ((cP@xx) ⇒ (cG@xx and cF@xx)) and (∀
(cQ@xx)) or ∃xx: $i: (cP@xx and cR@xx))) ⇒ ∃xx: $i: (cQ@xx and cP@xx) thf($cPELL_{25}$, conjecture)

SYN056+1.p Pelletier Problem 26
∃x: big_p(x) ⟺ ∃y: big_q(y) fof($pel26_1$, axiom)
∀x, y: ((big_p(x) and big_q(y)) ⇒ (big_r(x) ⟺ big_s(y))) fof($pel26_2$, axiom)
∀x: (big_p(x) ⇒ big_r(x)) ⟺ ∀y: (big_q(y) ⇒ big_s(y)) fof(pel_{26}, conjecture)

SYN056-1.p Pelletier Problem 26
big_p(x) ⇒ big_q(a) cnf($clause_1$, axiom)
big_q(x) ⇒ big_p(b) cnf($clause_2$, axiom)
(big_p(x) and big_q(y) and big_r(x)) ⇒ big_s(y) cnf($clause_3$, axiom)
(big_p(x) and big_q(y) and big_s(y)) ⇒ big_r(x) cnf($clause_4$, axiom)
(big_p(x) and big_q(x)) ⇒ (big_r(x) or big_s(x)) cnf($clause_5$, axiom)
big_p(x) ⇒ (big_p(c) or big_r(x)) cnf($clause_6$, negated_conjecture)
(big_p(x) and big_r(c)) ⇒ big_r(x) cnf($clause_7$, negated_conjecture)
big_q(x) ⇒ (big_q(d) or big_s(x)) cnf($clause_8$, negated_conjecture)
(big_q(x) and big_s(d)) ⇒ big_s(x) cnf($clause_9$, negated_conjecture)
big_p(c) or big_q(d) cnf($clause_{10}$, negated_conjecture)
big_r(c) ⇒ big_q(d) cnf($clause_{11}$, negated_conjecture)
big_s(d) ⇒ big_p(c) cnf($clause_{12}$, negated_conjecture)
big_r(c) ⇒ ¬ big_s(d) cnf($clause_{13}$, negated_conjecture)

SYN056∧5.p TPS problem PELL26
cR: $i → $o thf(cR, type)
cP: $i → $o thf(cP, type)
cS: $i → $o thf(cS, type)
cQ: $i → $o thf(cQ, type)
((∃xx: $i: (cP@xx) ⇒ ∃xx: $i: (cQ@xx)) and (∃xx: $i: (cQ@xx) ⇒ ∃xx: $i: (cP@xx)) and ∀xx: $i, xy: $i: ((cP@xx and cQ@x
(((cR@xx) ⇒ (cS@xy)) and ((cS@xy) ⇒ (cR@xx))))) ⇒ ((∀xx: $i: ((cP@xx) ⇒ (cR@xx)) ⇒ ∀xx: $i: ((cQ@xx) ⇒
(cS@xx))) and (∀xx: $i: ((cQ@xx) ⇒ (cS@xx)) ⇒ ∀xx: $i: ((cP@xx) ⇒ (cR@xx)))) thf($cPELL_{26}$, conjecture)

SYN057+1.p Pelletier Problem 27
∃x: (big_f(x) and ¬ big_g(x)) fof($pel27_1$, axiom)
∀x: (big_f(x) ⇒ big_h(x)) fof($pel27_2$, axiom)
∀x: ((big_j(x) and big_i(x)) ⇒ big_f(x)) fof($pel27_3$, axiom)
∃x: (big_h(x) and ¬ big_g(x)) ⇒ ∀x_1: (big_i(x_1) ⇒ ¬ big_h(x_1)) fof($pel27_4$, axiom)
∀x: (big_j(x) ⇒ ¬ big_i(x)) fof(pel_{27}, conjecture)

SYN057-1.p Pelletier Problem 27
big_f(a) cnf($clause_1$, axiom)
¬ big_g(a) cnf($clause_2$, axiom)
big_f(x) ⇒ big_h(x) cnf($clause_3$, axiom)
(big_j(x) and big_i(x)) ⇒ big_f(x) cnf($clause_4$, axiom)
(big_h(x) and big_i(y) and big_h(y)) ⇒ big_g(x) cnf($clause_5$, axiom)
big_j(b) cnf($clause_6$, negated_conjecture)
big_i(b) cnf($clause_7$, negated_conjecture)

SYN057∧5.p TPS problem PELL27
cI: $i → $o thf(cI, type)
cJ: $i → $o thf(cJ, type)
cH: $i → $o thf(cH, type)
cG: $i → $o thf(cG, type)
cF: $i → $o thf(cF, type)
(∃xx: $i: (cF@xx and ¬ cG@xx) and ∀xx: $i: ((cF@xx) ⇒ (cH@xx)) and ∀xx: $i: ((cJ@xx and cI@xx) ⇒ (cF@xx)) and (∃x
∀xx: $i: ((cI@xx) ⇒ ¬ cH@xx))) ⇒ ∀xx: $i: ((cJ@xx) ⇒ ¬ cI@xx) thf($cPELL_{27}$, conjecture)

SYN058+1.p Pelletier Problem 28
∀x: (big_p(x) ⇒ ∀z: big_q(z)) fof($pel28_1$, axiom)
∀x: (big_q(x) or big_r(x)) ⇒ ∃x_1: (big_q(x_1) and big_s(x_1)) fof($pel28_2$, axiom)
∃x: big_s(x) ⇒ ∀x_1: (big_f(x_1) ⇒ big_g(x_1)) fof($pel28_3$, axiom)
∀x: ((big_p(x) and big_f(x)) ⇒ big_g(x)) fof(pel_{28}, conjecture)

SYN058-1.p Pelletier Problem 28

big_p(x) $\Rightarrow$ big_q(y) cnf(clause$_1$, axiom)
big_q(b) $\Rightarrow$ big_q(c) cnf(clause$_2$, axiom)
big_q(b) $\Rightarrow$ big_s(c) cnf(clause$_3$, axiom)
big_r(b) $\Rightarrow$ big_q(c) cnf(clause$_4$, axiom)
big_r(b) $\Rightarrow$ big_s(c) cnf(clause$_5$, axiom)
(big_s(y) and big_f(x)) $\Rightarrow$ big_g(x) cnf(clause$_6$, axiom)
big_p(d) cnf(clause$_7$, negated_conjecture)
big_f(d) cnf(clause$_8$, negated_conjecture)
$\neg$ big_g(d) cnf(clause$_9$, negated_conjecture)

SYN058∧5.p TPS problem PELL28
cG: $i → $o thf(cG, type)
cF: $i → $o thf(cF, type)
cP: $i → $o thf(cP, type)
cS: $i → $o thf(cS, type)
cQ: $i → $o thf(cQ, type)
cR: $i → $o thf(cR, type)
(∀xx: $i: ((cP@xx) $\Rightarrow$ ∀xx$_0$: $i: (cQ@xx$_0$)) and (∀xx: $i: (cQ@xx or cR@xx) $\Rightarrow$ ∃xx: $i: (cQ@xx and cS@xx)) and (∃xx: $i:
∀xx: $i: ((cF@xx) $\Rightarrow$ (cG@xx)))) $\Rightarrow$ ∀xx: $i: ((cP@xx and cF@xx) $\Rightarrow$ (cG@xx)) thf(cPELL$_{28}$, conjecture)

SYN059+1.p Pelletier Problem 29
∃x: big_f(x) fof(pel29$_1$, axiom)
∃y: big_g(y) fof(pel29$_2$, axiom)
(∀x: (big_f(x) $\Rightarrow$ big_h(x)) and ∀u: (big_g(u) $\Rightarrow$ big_j(u))) $\iff$ ∀w, y: ((big_f(w) and big_g(y)) $\Rightarrow$ (big_h(w) and big_j(y))

SYN059-1.p Pelletier Problem 29
big_f(a) cnf(clause$_1$, axiom)
big_g(b) cnf(clause$_2$, axiom)
(big_f(x) and big_f(y) and big_g(z)) $\Rightarrow$ (big_h(x) or big_h(y)) cnf(clause$_3$, negated_conjecture)
(big_f(x) and big_f(y) and big_g(z)) $\Rightarrow$ (big_h(x) or big_j(z)) cnf(clause$_4$, negated_conjecture)
big_f(x) $\Rightarrow$ (big_h(x) or big_f(e) or big_g(f)) cnf(clause$_5$, negated_conjecture)
(big_f(x) and big_j(f)) $\Rightarrow$ (big_h(x) or big_f(e)) cnf(clause$_6$, negated_conjecture)
(big_f(x) and big_h(e)) $\Rightarrow$ (big_h(x) or big_g(f)) cnf(clause$_7$, negated_conjecture)
(big_f(x) and big_h(e) and big_j(f)) $\Rightarrow$ big_h(x) cnf(clause$_8$, negated_conjecture)
(big_g(x) and big_f(y) and big_g(z)) $\Rightarrow$ (big_j(x) or big_h(y)) cnf(clause$_9$, negated_conjecture)
(big_g(x) and big_f(y) and big_g(z)) $\Rightarrow$ (big_j(x) or big_j(z)) cnf(clause$_{10}$, negated_conjecture)
big_g(x) $\Rightarrow$ (big_j(x) or big_f(e) or big_g(j)) cnf(clause$_{11}$, negated_conjecture)
(big_g(x) and big_j(f)) $\Rightarrow$ (big_j(x) or big_f(e)) cnf(clause$_{12}$, negated_conjecture)
(big_g(x) and big_h(e)) $\Rightarrow$ (big_j(x) or big_g(f)) cnf(clause$_{13}$, negated_conjecture)
(big_g(x) and big_h(e) and big_j(f)) $\Rightarrow$ big_j(x) cnf(clause$_{14}$, negated_conjecture)
(big_f(x) and big_g(y)) $\Rightarrow$ (big_f(c) or big_h(x)) cnf(clause$_{15}$, negated_conjecture)
(big_f(x) and big_g(y)) $\Rightarrow$ (big_f(c) or big_j(y)) cnf(clause$_{16}$, negated_conjecture)
big_f(c) or big_f(e) or big_g(f) cnf(clause$_{17}$, negated_conjecture)
big_j(f) $\Rightarrow$ (big_f(c) or big_f(e)) cnf(clause$_{18}$, negated_conjecture)
big_h(e) $\Rightarrow$ (big_f(c) or big_g(f)) cnf(clause$_{19}$, negated_conjecture)
(big_h(e) and big_j(f)) $\Rightarrow$ big_f(c) cnf(clause$_{20}$, negated_conjecture)
(big_f(x) and big_g(y)) $\Rightarrow$ (big_g(d) or big_h(x)) cnf(clause$_{21}$, negated_conjecture)
(big_f(x) and big_g(y)) $\Rightarrow$ (big_g(d) or big_j(y)) cnf(clause$_{22}$, negated_conjecture)
big_g(d) or big_f(e) or big_g(f) cnf(clause$_{23}$, negated_conjecture)
big_j(f) $\Rightarrow$ (big_g(d) or big_f(e)) cnf(clause$_{24}$, negated_conjecture)
big_h(e) $\Rightarrow$ (big_g(d) or big_g(f)) cnf(clause$_{25}$, negated_conjecture)
(big_h(e) and big_j(f)) $\Rightarrow$ big_g(d) cnf(clause$_{26}$, negated_conjecture)
(big_h(c) and big_j(d) and big_f(x) and big_g(y)) $\Rightarrow$ big_h(x) cnf(clause$_{27}$, negated_conjecture)
(big_h(c) and big_j(d) and big_f(x) and big_g(y)) $\Rightarrow$ big_j(y) cnf(clause$_{28}$, negated_conjecture)
(big_h(c) and big_j(d)) $\Rightarrow$ (big_f(e) or big_g(f)) cnf(clause$_{29}$, negated_conjecture)
(big_h(c) and big_j(d) and big_j(f)) $\Rightarrow$ big_f(e) cnf(clause$_{30}$, negated_conjecture)
(big_h(c) and big_h(e)) $\Rightarrow$ (big_j(d) or big_g(f)) cnf(clause$_{31}$, negated_conjecture)
(big_h(c) and big_j(d) and big_h(e)) $\Rightarrow$ $\neg$ big_j(f) cnf(clause$_{32}$, negated_conjecture)

SYN059∧5.p TPS problem PELL29
cJ: $i → $o thf(cJ, type)

cG: $i → $o thf(cG, type)
cH: $i → $o thf(cH, type)
cF: $i → $o thf(cF, type)
(∃xx: $i: (cF@xx) and ∃xx: $i: (cG@xx)) ⇒ (((∀xx: $i: ((cF@xx) ⇒ (cH@xx)) and ∀xx: $i: ((cG@xx) ⇒ (cJ@xx))) ⇒ ∀xx: $i, xy: $i: ((cF@xx and cG@xy) ⇒ (cH@xx and cJ@xy))) and (∀xx: $i, xy: $i: ((cF@xx and cG@xy) ⇒ (cH@xx and cJ@xy)) ⇒ ∀xx: $i: ((cG@xx) ⇒ (cJ@xx)))) thf(cPELL$_{29}$, conjecture)

SYN060+1.p Pelletier Problem 30
∀x: ((big_f(x) or big_g(x)) ⇒ ¬ big_h(x)) fof(pel30$_1$, axiom)
∀x: ((big_g(x) ⇒ ¬ big_i(x)) ⇒ (big_f(x) and big_h(x))) fof(pel30$_2$, axiom)
∀x: big_i(x) fof(pel$_{30}$, conjecture)

SYN060-1.p Pelletier Problem 30
big_f(x) ⇒ ¬ big_h(x) cnf(clause$_1$, axiom)
big_g(x) or big_f(x) cnf(clause$_2$, axiom)
big_g(x) ⇒ ¬ big_h(x) cnf(clause$_3$, axiom)
big_g(x) or big_h(x) cnf(clause$_4$, axiom)
big_i(x) or big_f(x) cnf(clause$_5$, axiom)
big_i(x) or big_h(x) cnf(clause$_6$, axiom)
¬ big_i(a) cnf(clause$_7$, negated_conjecture)

SYN061+1.p Pelletier Problem 31
¬ ∃x: (big_f(x) and (big_g(x) or big_h(x))) fof(pel31$_1$, axiom)
∃x: (big_i(x) and big_f(x)) fof(pel31$_2$, axiom)
∀x: (¬ big_h(x) ⇒ big_j(x)) fof(pel31$_3$, axiom)
∃x: (big_i(x) and big_j(x)) fof(pel$_{31}$, conjecture)

SYN061-1.p Pelletier Problem 31
big_f(x) ⇒ ¬ big_g(x) cnf(clause$_1$, axiom)
big_f(x) ⇒ ¬ big_h(x) cnf(clause$_2$, axiom)
big_i(a) cnf(clause$_3$, axiom)
big_f(a) cnf(clause$_4$, axiom)
big_h(x) or big_j(x) cnf(clause$_5$, axiom)
big_i(x) ⇒ ¬ big_j(x) cnf(clause$_6$, negated_conjecture)

SYN062+1.p Pelletier Problem 32
∀x: ((big_f(x) and (big_g(x) or big_h(x))) ⇒ big_i(x)) fof(pel32$_1$, axiom)
∀x: ((big_i(x) and big_h(x)) ⇒ big_j(x)) fof(pel32$_2$, axiom)
∀x: (big_k(x) ⇒ big_h(x)) fof(pel32$_3$, axiom)
∀x: ((big_f(x) and big_k(x)) ⇒ big_j(x)) fof(pel$_{32}$, conjecture)

SYN062-1.p Pelletier Problem 32
(big_f(x) and big_g(x)) ⇒ big_i(x) cnf(clause$_1$, axiom)
(big_f(x) and big_h(x)) ⇒ big_i(x) cnf(clause$_2$, axiom)
(big_i(x) and big_h(x)) ⇒ big_j(x) cnf(clause$_3$, axiom)
big_k(x) ⇒ big_h(x) cnf(clause$_4$, axiom)
big_f(a) cnf(clause$_5$, negated_conjecture)
big_k(a) cnf(clause$_6$, negated_conjecture)
¬ big_j(a) cnf(clause$_7$, negated_conjecture)

SYN063+1.p Pelletier Problem 33
∀x: ((big_p(a) and (big_p(x) ⇒ big_p(b))) ⇒ big_p(c)) ⟺ ∀x_1: ((¬ big_p(a) or big_p(x_1) or big_p(c)) and (¬ big_p(a) or

SYN063-1.p Pelletier Problem 33
big_p(a) cnf(clause$_1$, negated_conjecture)
big_p(a) ⇒ (big_p(x) or big_p(c) or big_p(y)) cnf(clause$_2$, negated_conjecture)
(big_p(a) and big_p(b)) ⇒ big_p(c) cnf(clause$_3$, negated_conjecture)
¬ big_p(c) cnf(clause$_4$, negated_conjecture)
(big_p(e) and big_p(d)) ⇒ big_p(b) cnf(clause$_5$, negated_conjecture)
(big_p(a) and big_p(d)) ⇒ (big_p(x) or big_p(c) or big_p(b)) cnf(clause$_6$, negated_conjecture)
(big_p(e) and big_p(a)) ⇒ (big_p(b) or big_p(x) or big_p(c)) cnf(clause$_7$, negated_conjecture)

SYN063-2.p Pelletier Problem 33
big_p(a) ⇒ big_p(c) cnf(pel33$_1$, negated_conjecture)
big_p(a) cnf(pel33$_2$, negated_conjecture)

$\neg$ big_p(c) cnf(pel33$_3$, negated_conjecture)

SYN064+1.p Pelletier Problem 35
$\exists x, y$: (big_p(x, y) $\Rightarrow$ $\forall z, w$: big_p(z, w)) fof(pel$_{35}$, conjecture)

SYN064-1.p Pelletier Problem 35
big_p(x, y) cnf(clause$_1$, negated_conjecture)
$\neg$ big_p($f(x, y), g(x, y)$) cnf(clause$_2$, negated_conjecture)

SYN064^5.p TPS problem PELL35
cP: \$i $\rightarrow$ \$i $\rightarrow$ \$o thf(cP, type)
$\exists$xx: \$i, xy: \$i: ((cP@xx@xy) $\Rightarrow$ $\forall$xx$_0$: \$i, xy$_0$: \$i: (cP@xx$_0$@xy$_0$)) thf(cPELL$_{35}$, conjecture)

SYN065+1.p Pelletier Problem 36
$\forall x$: $\exists y$: big_f(x, y) fof(pel36$_1$, axiom)
$\forall x$: $\exists y$: big_g(x, y) fof(pel36$_2$, axiom)
$\forall x, y$: ((big_f(x, y) or big_g(x, y)) $\Rightarrow$ $\forall z$: ((big_f(y, z) or big_g(y, z)) $\Rightarrow$ big_h(x, z))) fof(pel36$_3$, axiom)
$\forall x$: $\exists y$: big_h(x, y) fof(pel$_{36}$, conjecture)

SYN065-1.p Pelletier Problem 36
big_f($x, f(x)$) cnf(clause$_1$, axiom)
big_g($x, g(x)$) cnf(clause$_2$, axiom)
(big_f(x, y) and big_f(y, z)) $\Rightarrow$ big_h(x, z) cnf(clause$_3$, axiom)
(big_f(x, y) and big_g(y, z)) $\Rightarrow$ big_h(x, z) cnf(clause$_4$, axiom)
(big_g(x, y) and big_f(y, z)) $\Rightarrow$ big_h(x, z) cnf(clause$_5$, axiom)
(big_g(x, y) and big_g(y, z)) $\Rightarrow$ big_h(x, z) cnf(clause$_6$, axiom)
$\neg$ big_h(a, x) cnf(clause$_7$, negated_conjecture)

SYN066+1.p Pelletier Problem 37
$\forall z$: $\exists w$: $\forall x$: $\exists y$: ((big_p(x, z) $\Rightarrow$ big_p(y, w)) and big_p(y, z) and (big_p(y, w) $\Rightarrow$ $\exists u$: big_q(u, w))) fof(pel37$_1$, axiom)
$\forall x, z$: ($\neg$ big_p(x, z) $\Rightarrow$ $\exists y$: big_q(y, z)) fof(pel37$_2$, axiom)
$\exists x, y$: big_q(x, y) $\Rightarrow$ $\forall z$: big_r(z, z) fof(pel37$_3$, axiom)
$\forall x$: $\exists y$: big_r(x, y) fof(pel$_{37}$, conjecture)

SYN066-1.p Pelletier Problem 37
big_p(y, x) $\Rightarrow$ big_p($f(x, y), g(x)$) cnf(clause$_1$, axiom)
big_p($f(x, y), x$) cnf(clause$_2$, axiom)
big_p($f(x, y), g(x)$) $\Rightarrow$ big_q($h(x, y), g(x)$) cnf(clause$_3$, axiom)
big_p(x, y) or big_q($i(x, y), x$) cnf(clause$_4$, axiom)
big_q(x, y) $\Rightarrow$ big_r(z, z) cnf(clause$_5$, axiom)
$\neg$ big_r(a, z) cnf(clause$_6$, negated_conjecture)

SYN067+1.p Pelletier Problem 38
$\forall x$: ((big_p(a) and (big_p(x) $\Rightarrow$ $\exists y$: (big_p(y) and big_r(x, y)))) $\Rightarrow$ $\exists z, w$: (big_p(z) and big_r(x, w) and big_r(w, z))) $\iff$
$\forall x_1$: ((($\neg$ big_p(a) or big_p(x_1) or $\exists z_1, w_1$: (big_p(z_1) and big_r(x_1, w_1) and big_r(w_1, z_1))) and ($\neg$ big_p(a) or $\neg$ $\exists y_1$: (big_p(y_1)

SYN068+1.p Pelletier Problem 44
$\forall x$: (big_f(x) $\Rightarrow$ ($\exists y$: (big_g(y) and big_h(x, y)) and $\exists y_1$: (big_g(y_1) and $\neg$ big_h(x, y_1)))) fof(pel44$_1$, axiom)
$\exists x$: (big_j(x) and $\forall y$: (big_g(y) $\Rightarrow$ big_h(x, y))) fof(pel44$_2$, axiom)
$\exists x$: (big_j(x) and $\neg$ big_f(x)) fof(pel$_{44}$, conjecture)

SYN068-1.p Pelletier Problem 44
big_f(x) $\Rightarrow$ big_g($f(x)$) cnf(clause$_1$, axiom)
big_f(x) $\Rightarrow$ big_h($x, f(x)$) cnf(clause$_2$, axiom)
big_f(x) $\Rightarrow$ big_g($g(x)$) cnf(clause$_3$, axiom)
big_f(x) $\Rightarrow$ $\neg$ big_h($x, g(x)$) cnf(clause$_4$, axiom)
big_j(a) cnf(clause$_5$, axiom)
big_g(x) $\Rightarrow$ big_h(a, x) cnf(clause$_6$, axiom)
big_j(x) $\Rightarrow$ big_f(x) cnf(clause$_7$, negated_conjecture)

SYN069+1.p Pelletier Problem 45
$\forall x$: ((big_f(x) and $\forall y$: ((big_g(y) and big_h(x, y)) $\Rightarrow$ big_j(x, y))) $\Rightarrow$ $\forall y_1$: (big_g(y_1) and big_h(x, y_1) and big_k(y_1))) fof(
$\neg$ $\exists y$: (big_l(y) and big_k(y)) fof(pel45$_2$, axiom)
$\exists x$: (big_f(x) and $\forall y$: (big_h(x, y) $\Rightarrow$ big_l(y)) and $\forall y_1$: ((big_g(y_1) and big_h(x, y_1)) $\Rightarrow$ big_j(x, y_1))) fof(pel45$_3$, axiom)
$\exists x$: (big_f(x) and $\neg$ $\exists y$: (big_g(y) and big_h(x, y))) fof(pel$_{45}$, conjecture)

SYN069-1.p Pelletier Problem 45

(big_f(x) and big_g(y) and big_h(x, y)) $\Rightarrow$ (big_g($f(x)$) or big_k(y)) cnf(clause$_1$, axiom)
(big_f(x) and big_g(y) and big_h(x, y)) $\Rightarrow$ (big_h($x, f(x)$) or big_k(y)) cnf(clause$_2$, axiom)
(big_f(x) and big_j($x, f(x)$) and big_g(y) and big_h(x, y)) $\Rightarrow$ big_k(y) cnf(clause$_3$, axiom)
big_l(x) $\Rightarrow$ $\neg$ big_k(x) cnf(clause$_4$, axiom)
big_f(a) cnf(clause$_5$, axiom)
big_h(a, x) $\Rightarrow$ big_l(x) cnf(clause$_6$, axiom)
(big_g(x) and big_h(a, x)) $\Rightarrow$ big_j(a, x) cnf(clause$_7$, axiom)
big_f(x) $\Rightarrow$ big_g($g(x)$) cnf(clause$_8$, negated_conjecture)
big_f(x) $\Rightarrow$ big_h($x, g(x)$) cnf(clause$_9$, negated_conjecture)

SYN070+1.p Pelletier Problem 46
$\forall x, y$: ((big_f(x) and ((big_f(y) and big_h(y, x)) $\Rightarrow$ big_g(y))) $\Rightarrow$ big_g(x)) fof(pel46$_1$, axiom)
$\exists x$: (big_f(x) and $\neg$ big_g(x)) $\Rightarrow$ $\exists x_1$: (big_f(x_1) and $\neg$ big_g(x_1) and $\forall y$: ((big_f(y) and $\neg$ big_g(y)) $\Rightarrow$ big_j(x_1, y))) fof(p
$\forall x, y$: ((big_f(x) and big_f(y) and big_h(x, y)) $\Rightarrow$ $\neg$ big_j(y, x)) fof(pel46$_3$, axiom)
$\forall x$: (big_f(x) $\Rightarrow$ big_g(x)) fof(pel$_{46}$, conjecture)

SYN070-1.p Pelletier Problem 46
big_f(x) $\Rightarrow$ (big_f($f(x)$) or big_g(x)) cnf(clause$_1$, axiom)
big_f(x) $\Rightarrow$ (big_h($f(x), x$) or big_g(x)) cnf(clause$_2$, axiom)
(big_f(x) and big_g($f(x)$)) $\Rightarrow$ big_g(x) cnf(clause$_3$, axiom)
big_f(x) $\Rightarrow$ (big_g(x) or big_f(a)) cnf(clause$_4$, axiom)
(big_f(x) and big_g(a)) $\Rightarrow$ big_g(x) cnf(clause$_5$, axiom)
(big_f(x) and big_f(y)) $\Rightarrow$ (big_g(x) or big_g(y) or big_j(a, y)) cnf(clause$_6$, axiom)
(big_f(x) and big_f(y) and big_h(x, y)) $\Rightarrow$ $\neg$ big_j(y, x) cnf(clause$_7$, axiom)
big_f(b) cnf(clause$_8$, negated_conjecture)
$\neg$ big_g(b) cnf(clause$_9$, negated_conjecture)

SYN071+1.p Pelletier Problem 48
$a = b$ or $c = d$ fof(pel48$_1$, axiom)
$a = c$ or $b = d$ fof(pel48$_2$, axiom)
$a = d$ or $b = c$ fof(pel$_{48}$, conjecture)

SYN071-1.p Pelletier Problem 48
$a = b$ or $c = d$ cnf(clause$_1$, axiom)
$a = c$ or $b = d$ cnf(clause$_2$, axiom)
$a \neq d$ cnf(clause$_3$, negated_conjecture)
$b \neq c$ cnf(clause$_4$, negated_conjecture)

SYN072+1.p Pelletier Problem 49
$\exists x, y$: $\forall z$: ($z = x$ or $z = y$) fof(pel49$_1$, axiom)
big_p(a) fof(pel49$_2$, axiom)
big_p(b) fof(pel49$_3$, axiom)
$a \neq b$ fof(pel49$_4$, axiom)
$\forall x$: big_p(x) fof(pel$_{49}$, conjecture)

SYN072-1.p Pelletier Problem 49
$x = c$ or $x = d$ cnf(clause$_1$, axiom)
big_p(a) cnf(clause$_2$, axiom)
big_p(b) cnf(clause$_3$, axiom)
$a \neq b$ cnf(clause$_4$, axiom)
$\neg$ big_p(e) cnf(prove_this, negated_conjecture)

SYN073+1.p Pelletier Problem 50
$\forall x$: (big_f(a, x) or $\forall y$: big_f(x, y)) $\Rightarrow$ $\exists x_1$: $\forall y_1$: big_f(x_1, y_1) fof(pel$_{50}$, conjecture)

SYN073-1.p Pelletier Problem 50
big_f(a, x) or big_f(x, y) cnf(clause$_1$, negated_conjecture)
$\neg$ big_f($x, f(x)$) cnf(prove_this, negated_conjecture)

SYN074+1.p Pelletier Problem 51
$\exists z, w$: $\forall x, y$: (big_f(x, y) $\iff$ ($x = z$ and $y = w$)) fof(pel51$_1$, axiom)
$\exists z$: $\forall x$: ($\exists w$: $\forall y$: (big_f(x, y) $\iff$ $y = w$) $\iff$ $x = z$) fof(pel$_{51}$, conjecture)

SYN074-1.p Pelletier Problem 51
big_f(x, y) $\Rightarrow$ $x = a$ cnf(clause$_1$, axiom)

$\text{big\_f}(x, y) \Rightarrow y = b$ $\quad \text{cnf}(\text{clause}_2, \text{axiom})$
$(x = a \text{ and } y = b) \Rightarrow \text{big\_f}(x, y)$ $\quad \text{cnf}(\text{clause}_3, \text{axiom})$
$\text{big\_f}(f(x), y) \Rightarrow (y = g(x) \text{ or } f(x) = x)$ $\quad \text{cnf}(\text{clause}_4, \text{negated\_conjecture})$
$\text{big\_f}(f(x), y) \Rightarrow (y = g(x) \text{ or } \text{big\_f}(f(x), h(x, z)) \text{ or } h(x, z) = z)$ $\quad \text{cnf}(\text{clause}_5, \text{negated\_conjecture})$
$(\text{big\_f}(f(x), y) \text{ and } h(x, z) = z \text{ and } \text{big\_f}(f(x), h(x, z))) \Rightarrow y = g(x)$ $\quad \text{cnf}(\text{clause}_6, \text{negated\_conjecture})$
$y = g(x) \Rightarrow (\text{big\_f}(f(x), y) \text{ or } \text{big\_f}(f(x), h(x, z)) \text{ or } h(x, z) = z)$ $\quad \text{cnf}(\text{clause}_7, \text{negated\_conjecture})$
$y = g(x) \Rightarrow (\text{big\_f}(f(x), y) \text{ or } f(x) = x)$ $\quad \text{cnf}(\text{clause}_8, \text{negated\_conjecture})$
$(y = g(x) \text{ and } h(x, z) = z \text{ and } \text{big\_f}(f(x), h(x, z))) \Rightarrow \text{big\_f}(f(x), y)$ $\quad \text{cnf}(\text{clause}_9, \text{negated\_conjecture})$
$f(x) = x \Rightarrow (\text{big\_f}(f(x), h(x, z)) \text{ or } h(x, z) = z)$ $\quad \text{cnf}(\text{clause}_{10}, \text{negated\_conjecture})$
$(f(x) = x \text{ and } h(x, z) = z) \Rightarrow \neg\, \text{big\_f}(f(x), h(x, z))$ $\quad \text{cnf}(\text{clause}_{11}, \text{negated\_conjecture})$

SYN075+1.p Pelletier Problem 52
$\exists z, w\colon \forall x, y\colon (\text{big\_f}(x, y) \iff (x = z \text{ and } y = w))$ $\quad \text{fof}(\text{pel52}_1, \text{axiom})$
$\exists w\colon \forall y\colon (\exists z\colon \forall x\colon (\text{big\_f}(x, y) \iff x = z) \iff y = w)$ $\quad \text{fof}(\text{pel}_{52}, \text{conjecture})$

SYN075-1.p Pelletier Problem 52
$\text{big\_f}(x, y) \Rightarrow x = a$ $\quad \text{cnf}(\text{clause}_1, \text{axiom})$
$\text{big\_f}(x, y) \Rightarrow y = b$ $\quad \text{cnf}(\text{clause}_2, \text{axiom})$
$(x = a \text{ and } y = b) \Rightarrow \text{big\_f}(x, y)$ $\quad \text{cnf}(\text{clause}_3, \text{axiom})$
$(\text{big\_f}(y, f(x)) \text{ and } y = g(x)) \Rightarrow f(x) = x$ $\quad \text{cnf}(\text{clause}_4, \text{negated\_conjecture})$
$(\text{big\_f}(y, f(x)) \text{ and } \text{big\_f}(h(x, z), f(x))) \Rightarrow (y = g(x) \text{ or } \text{big\_f}(h(x, z), f(x)))$ $\quad \text{cnf}(\text{clause}_5, \text{negated\_conjecture})$
$y = g(x) \Rightarrow (\text{big\_f}(y, f(x)) \text{ or } f(x) = x)$ $\quad \text{cnf}(\text{clause}_6, \text{negated\_conjecture})$
$y = g(x) \Rightarrow (\text{big\_f}(y, f(x)) \text{ or } \text{big\_f}(h(x, z), f(x)) \text{ or } h(x, z) = z)$ $\quad \text{cnf}(\text{clause}_7, \text{negated\_conjecture})$
$(y = g(x) \text{ and } h(x, z) = z \text{ and } \text{big\_f}(h(x, z), f(x))) \Rightarrow \text{big\_f}(y, f(x))$ $\quad \text{cnf}(\text{clause}_8, \text{negated\_conjecture})$
$f(x) = x \Rightarrow (\text{big\_f}(h(x, z), f(x)) \text{ or } h(x, z) = z)$ $\quad \text{cnf}(\text{clause}_9, \text{negated\_conjecture})$
$(f(x) = x \text{ and } h(x, z) = z) \Rightarrow \neg\, \text{big\_f}(h(x, z), f(x))$ $\quad \text{cnf}(\text{clause}_{10}, \text{negated\_conjecture})$

SYN076+1.p Pelletier Problem 53
$\exists x, y\colon (x \neq y \text{ and } \forall z\colon (z = x \text{ or } z = y))$ $\quad \text{fof}(\text{pel53}_1, \text{axiom})$
$\exists z\colon \forall x\colon (\exists w\colon \forall y\colon (\text{big\_f}(x, y) \iff y = w) \iff x = z) \iff \exists w_1\colon \forall y_1\colon (\exists z_1\colon \forall x_1\colon (\text{big\_f}(x_1, y_1) \iff x_1 = z_1) \iff y_1 = w_1)$ $\quad \text{fof}(\text{pel}_{53}, \text{conjecture})$

SYN077+1.p Pelletier Problem 54
Montegue's paradox of grounded classes
$\forall y\colon \exists z\colon \forall x\colon (\text{big\_f}(x, z) \iff x = y)$ $\quad \text{fof}(\text{pel54}_1, \text{axiom})$
$\neg\, \exists w\colon \forall x\colon (\text{big\_f}(x, w) \iff \forall u\colon (\text{big\_f}(x, u) \Rightarrow \exists y\colon (\text{big\_f}(y, u) \text{ and } \neg\, \exists z\colon (\text{big\_f}(z, u) \text{ and } \text{big\_f}(z, y)))))$ $\quad \text{fof}(\text{pel}_{54}, \text{conjectu}$

SYN077-1.p Pelletier Problem 54
Montegue's paradox of grounded classes
$\text{big\_f}(x, f(y)) \Rightarrow x = y$ $\quad \text{cnf}(\text{clause}_1, \text{axiom})$
$x = y \Rightarrow \text{big\_f}(x, f(y))$ $\quad \text{cnf}(\text{clause}_2, \text{axiom})$
$(\text{big\_f}(x, a) \text{ and } \text{big\_f}(x, y)) \Rightarrow \text{big\_f}(g(x, y), y)$ $\quad \text{cnf}(\text{clause}_3, \text{negated\_conjecture})$
$(\text{big\_f}(x, a) \text{ and } \text{big\_f}(x, y) \text{ and } \text{big\_f}(z, g(x, y))) \Rightarrow \neg\, \text{big\_f}(z, y)$ $\quad \text{cnf}(\text{clause}_4, \text{negated\_conjecture})$
$\text{big\_f}(x, h(x)) \text{ or } \text{big\_f}(x, a)$ $\quad \text{cnf}(\text{clause}_5, \text{negated\_conjecture})$
$\text{big\_f}(x, h(y)) \Rightarrow (\text{big\_f}(i(y, x), x) \text{ or } \text{big\_f}(y, a))$ $\quad \text{cnf}(\text{clause}_6, \text{negated\_conjecture})$
$\text{big\_f}(y, h(x)) \Rightarrow (\text{big\_f}(x, a) \text{ or } \text{big\_f}(i(x, y), h(x)))$ $\quad \text{cnf}(\text{clause}_7, \text{negated\_conjecture})$

SYN078+1.p Pelletier Problem 56
$\forall x\colon (\exists y\colon (\text{big\_p}(y) \text{ and } x = f(y)) \Rightarrow \text{big\_p}(x)) \iff \forall u\colon (\text{big\_p}(u) \Rightarrow \text{big\_p}(f(u)))$ $\quad \text{fof}(\text{pel}_{56}, \text{conjecture})$

SYN078-1.p Pelletier Problem 56
$(\text{big\_f}(x) \text{ and } y = f(y) \text{ and } \text{big\_f}(z)) \Rightarrow (\text{big\_f}(y) \text{ or } \text{big\_f}(f(z)))$ $\quad \text{cnf}(\text{clause}_1, \text{negated\_conjecture})$
$(\text{big\_f}(x) \text{ and } y = f(y)) \Rightarrow (\text{big\_f}(y) \text{ or } \text{big\_f}(a))$ $\quad \text{cnf}(\text{clause}_2, \text{negated\_conjecture})$
$(\text{big\_f}(x) \text{ and } y = f(y)) \Rightarrow (\text{big\_f}(y) \text{ or } b = f(b))$ $\quad \text{cnf}(\text{clause}_3, \text{negated\_conjecture})$
$(\text{big\_f}(x) \text{ and } y = f(y) \text{ and } \text{big\_f}(b)) \Rightarrow \text{big\_f}(y)$ $\quad \text{cnf}(\text{clause}_4, \text{negated\_conjecture})$
$\text{big\_f}(x) \Rightarrow (\text{big\_f}(c) \text{ or } \text{big\_f}(f(x)))$ $\quad \text{cnf}(\text{clause}_5, \text{negated\_conjecture})$
$\text{big\_f}(c) \text{ or } \text{big\_f}(a)$ $\quad \text{cnf}(\text{clause}_6, \text{negated\_conjecture})$
$\text{big\_f}(c) \text{ or } b = f(b)$ $\quad \text{cnf}(\text{clause}_7, \text{negated\_conjecture})$
$\text{big\_f}(b) \Rightarrow \text{big\_f}(c)$ $\quad \text{cnf}(\text{clause}_8, \text{negated\_conjecture})$
$(\text{big\_f}(f(c)) \text{ and } \text{big\_f}(x)) \Rightarrow \text{big\_f}(f(x))$ $\quad \text{cnf}(\text{clause}_9, \text{negated\_conjecture})$
$\text{big\_f}(f(c)) \Rightarrow \text{big\_f}(a)$ $\quad \text{cnf}(\text{clause}_{10}, \text{negated\_conjecture})$
$\text{big\_f}(f(c)) \Rightarrow b = f(b)$ $\quad \text{cnf}(\text{clause}_{11}, \text{negated\_conjecture})$
$\text{big\_f}(f(c)) \Rightarrow \neg\, \text{big\_f}(b)$ $\quad \text{cnf}(\text{clause}_{12}, \text{negated\_conjecture})$

SYN079+1.p Pelletier Problem 57
$\text{big\_f}(f(a,b),f(b,c))$ $\text{fof}(\text{pel57}_1,\text{axiom})$
$\text{big\_f}(f(b,c),f(a,c))$ $\text{fof}(\text{pel57}_2,\text{axiom})$
$\forall x,y,z$: $((\text{big\_f}(x,y)$ and $\text{big\_f}(y,z)) \Rightarrow \text{big\_f}(x,z))$ $\text{fof}(\text{pel57}_3,\text{axiom})$
$\text{big\_f}(f(a,b),f(a,c))$ $\text{fof}(\text{pel}_{57},\text{conjecture})$

SYN079-1.p Pelletier Problem 57
$\text{big\_f}(f(a,b),f(b,c))$ $\text{cnf}(\text{clause}_1,\text{axiom})$
$\text{big\_f}(f(b,c),f(a,c))$ $\text{cnf}(\text{clause}_2,\text{axiom})$
$(\text{big\_f}(x,y)$ and $\text{big\_f}(y,z)) \Rightarrow \text{big\_f}(x,z)$ $\text{cnf}(\text{clause}_3,\text{axiom})$
$\neg\,\text{big\_f}(f(a,b),f(a,c))$ $\text{cnf}(\text{prove\_this},\text{negated\_conjecture})$

SYN080+1.p Pelletier Problem 58
$\forall x,y$: $f(x)=g(y)$ $\text{fof}(\text{pel58}_1,\text{axiom})$
$\forall x,y$: $f(f(x))=f(g(y))$ $\text{fof}(\text{pel}_{58},\text{conjecture})$

SYN080-1.p Pelletier Problem 58
$f(x)=g(y)$ $\text{cnf}(\text{clause}_1,\text{axiom})$
$f(f(a))\neq f(g(b))$ $\text{cnf}(\text{prove\_this},\text{negated\_conjecture})$

SYN081+1.p Pelletier Problem 59
$\forall x$: $(\text{big\_f}(x) \iff \neg\,\text{big\_f}(f(x)))$ $\text{fof}(\text{pel59}_1,\text{axiom})$
$\exists x$: $(\text{big\_f}(x)$ and $\neg\,\text{big\_f}(f(x)))$ $\text{fof}(\text{pel}_{59},\text{conjecture})$

SYN081-1.p Pelletier Problem 59
$\text{big\_f}(x) \Rightarrow \neg\,\text{big\_f}(f(x))$ $\text{cnf}(\text{clause}_1,\text{axiom})$
$\text{big\_f}(f(x))$ or $\text{big\_f}(x)$ $\text{cnf}(\text{clause}_2,\text{axiom})$
$\text{big\_f}(x) \Rightarrow \text{big\_f}(f(x))$ $\text{cnf}(\text{prove\_this},\text{negated\_conjecture})$

SYN082+1.p Pelletier Problem 60
$\forall x$: $(\text{big\_f}(x,f(x)) \iff \exists y$: $(\forall z$: $(\text{big\_f}(z,y) \Rightarrow \text{big\_f}(z,f(x)))$ and $\text{big\_f}(x,y)))$ $\text{fof}(\text{pel}_{60},\text{conjecture})$

SYN082-1.p Pelletier Problem 60
$\text{big\_f}(y,b) \Rightarrow (\text{big\_f}(a,f(a))$ or $\text{big\_f}(y,f(a)))$ $\text{cnf}(\text{clause}_1,\text{negated\_conjecture})$
$\text{big\_f}(a,f(a))$ or $\text{big\_f}(a,b)$ $\text{cnf}(\text{clause}_2,\text{negated\_conjecture})$
$(\text{big\_f}(a,x)$ and $\text{big\_f}(y,b)) \Rightarrow (\text{big\_f}(g(x),x)$ or $\text{big\_f}(y,f(a)))$ $\text{cnf}(\text{clause}_3,\text{negated\_conjecture})$
$\text{big\_f}(a,x) \Rightarrow (\text{big\_f}(g(x),x)$ or $\text{big\_f}(a,b))$ $\text{cnf}(\text{clause}_4,\text{negated\_conjecture})$
$(\text{big\_f}(a,x)$ and $\text{big\_f}(a,f(a))) \Rightarrow \text{big\_f}(g(x),x)$ $\text{cnf}(\text{clause}_5,\text{negated\_conjecture})$
$(\text{big\_f}(g(x),x)$ and $\text{big\_f}(a,x)$ and $\text{big\_f}(y,b)) \Rightarrow \text{big\_f}(y,f(a))$ $\text{cnf}(\text{clause}_6,\text{negated\_conjecture})$
$(\text{big\_f}(g(x),x)$ and $\text{big\_f}(a,x)) \Rightarrow \text{big\_f}(a,b)$ $\text{cnf}(\text{clause}_7,\text{negated\_conjecture})$
$(\text{big\_f}(g(x),x)$ and $\text{big\_f}(a,x)) \Rightarrow \neg\,\text{big\_f}(a,f(a))$ $\text{cnf}(\text{clause}_8,\text{negated\_conjecture})$

SYN083+1.p Pelletier Problem 61
$\forall x,y,z$: $f(x,f(y,z))=f(f(x,y),z)$ $\text{fof}(\text{p61}_1,\text{axiom})$
$\forall x,y,z,w$: $f(x,f(y,f(z,w)))=f(f(f(x,y),z),w)$ $\text{fof}(\text{pel}_{61},\text{conjecture})$

SYN083-1.p Pelletier Problem 61
$f(x,f(y,z))=f(f(x,y),z)$ $\text{cnf}(\text{f\_is\_associative},\text{axiom})$
$f(a,f(b,f(c,d)))\neq f(f(f(a,b),c),d)$ $\text{cnf}(\text{prove\_this},\text{negated\_conjecture})$

SYN084+1.p Pelletier Problem 62
$\forall x$: $((\text{big\_p}(a)$ and $(\text{big\_p}(x) \Rightarrow \text{big\_p}(f(x)))) \Rightarrow \text{big\_p}(f(f(x)))) \iff \forall x_1$: $((\neg\,\text{big\_p}(a)$ or $\text{big\_p}(x_1)$ or $\text{big\_p}(f(f(x_1))))$ a

SYN084-1.p Pelletier Problem 62
$\text{big\_p}(a)$ $\text{cnf}(\text{clause}_1,\text{negated\_conjecture})$
$(\text{big\_p}(f(y))$ and $\text{big\_p}(a)) \Rightarrow (\text{big\_p}(f(f(x)))$ or $\text{big\_p}(x))$ $\text{cnf}(\text{clause}_2,\text{negated\_conjecture})$
$\text{big\_p}(a) \Rightarrow (\text{big\_p}(y)$ or $\text{big\_p}(f(f(x)))$ or $\text{big\_p}(x))$ $\text{cnf}(\text{clause}_3,\text{negated\_conjecture})$
$(\text{big\_p}(c)$ and $\text{big\_p}(a)) \Rightarrow (\text{big\_p}(f(c))$ or $\text{big\_p}(f(f(x)))$ or $\text{big\_p}(x))$ $\text{cnf}(\text{clause}_4,\text{negated\_conjecture})$
$(\text{big\_p}(f(f(c)))$ and $\text{big\_p}(a)) \Rightarrow (\text{big\_p}(f(f(x)))$ or $\text{big\_p}(x))$ $\text{cnf}(\text{clause}_5,\text{negated\_conjecture})$
$(\text{big\_p}(f(f(c)))$ and $\text{big\_p}(f(x))$ and $\text{big\_p}(a)) \Rightarrow \text{big\_p}(f(f(x)))$ $\text{cnf}(\text{clause}_6,\text{negated\_conjecture})$
$(\text{big\_p}(c)$ and $\text{big\_p}(f(x))$ and $\text{big\_p}(a)) \Rightarrow (\text{big\_p}(f(c))$ or $\text{big\_p}(f(f(x))))$ $\text{cnf}(\text{clause}_7,\text{negated\_conjecture})$
$(\text{big\_p}(f(x))$ and $\text{big\_p}(a)) \Rightarrow (\text{big\_p}(y)$ or $\text{big\_p}(f(f(x))))$ $\text{cnf}(\text{clause}_8,\text{negated\_conjecture})$
$(\text{big\_p}(f(y))$ and $\text{big\_p}(f(x))$ and $\text{big\_p}(a)) \Rightarrow \text{big\_p}(f(f(x)))$ $\text{cnf}(\text{clause}_9,\text{negated\_conjecture})$
$(\text{big\_p}(f(f(c)))$ and $\text{big\_p}(b)) \Rightarrow \text{big\_p}(f(b))$ $\text{cnf}(\text{clause}_{10},\text{negated\_conjecture})$
$(\text{big\_p}(c)$ and $\text{big\_p}(b)) \Rightarrow (\text{big\_p}(f(c))$ or $\text{big\_p}(f(b)))$ $\text{cnf}(\text{clause}_{11},\text{negated\_conjecture})$
$(\text{big\_p}(a)$ and $\text{big\_p}(b)) \Rightarrow (\text{big\_p}(y)$ or $\text{big\_p}(f(b)))$ $\text{cnf}(\text{clause}_{12},\text{negated\_conjecture})$

(big_p(a) and big_p($f(y)$) and big_p(b)) $\Rightarrow$ big_p($f(b)$) cnf(clause$_{13}$, negated_conjecture)

SYN084-2.p Pelletier Problem 62
big_p(a) cnf(pel62$_1$, negated_conjecture)
big_p(a) $\Rightarrow$ (big_p($f(f(a))$) or big_p(a)) cnf(pel62$_2$, negated_conjecture)
(big_p($f(a)$) and big_p(a)) $\Rightarrow$ big_p($f(f(a))$) cnf(pel62$_3$, negated_conjecture)
big_p($f(f(\mathrm{sk}_1))$) $\Rightarrow$ $\neg$ big_p($f(f(\mathrm{sk}_2))$) cnf(pel62$_4$, negated_conjecture)
(big_p(sk_1) and big_p(sk_2)) $\Rightarrow$ (big_p($f(\mathrm{sk}_1)$) or big_p($f(\mathrm{sk}_2)$)) cnf(pel62$_5$, negated_conjecture)
(big_p(sk_1) and big_p($f(f(\mathrm{sk}_2))$)) $\Rightarrow$ big_p($f(\mathrm{sk}_1)$) cnf(pel62$_6$, negated_conjecture)
(big_p(sk_2) and big_p($f(f(\mathrm{sk}_1))$)) $\Rightarrow$ big_p($f(\mathrm{sk}_2)$) cnf(pel62$_7$, negated_conjecture)

SYN085-1.010.p Plaisted problem s(1,10)
$\neg\, p_0$ cnf(s1_goal$_1$, negated_conjecture)
(p_1 and p_2 and p_3 and p_4 and p_5 and p_6 and p_7 and p_8 and p_9 and p_{10}) $\Rightarrow$ p_0 cnf(s1$_1$, axiom)
p_1 cnf(s1$_2$, axiom)
p_2 cnf(s1$_3$, axiom)
p_3 cnf(s1$_4$, axiom)
p_4 cnf(s1$_5$, axiom)
p_5 cnf(s1$_6$, axiom)
p_6 cnf(s1$_7$, axiom)
p_7 cnf(s1$_8$, axiom)
p_8 cnf(s1$_9$, axiom)
p_9 cnf(s1$_{10}$, axiom)
p_{10} cnf(s1$_{11}$, axiom)

SYN086-1.003.p Plaisted problem s(2,3)
$\neg$ p_1$_3$ cnf(s2_goal$_1$, negated_conjecture)
(p_2$_2$ and p_1$_1$) $\Rightarrow$ p_1$_2$ cnf(s2_type11$_1$, axiom)
(q_2$_2$ and q_1$_1$) $\Rightarrow$ p_1$_2$ cnf(s2_type11$_2$, axiom)
(p_2$_3$ and p_1$_2$) $\Rightarrow$ p_1$_3$ cnf(s2_type11$_3$, axiom)
(q_2$_3$ and q_1$_2$) $\Rightarrow$ p_1$_3$ cnf(s2_type11$_4$, axiom)
(p_3$_3$ and p_2$_2$) $\Rightarrow$ p_2$_3$ cnf(s2_type11$_5$, axiom)
(q_3$_3$ and q_2$_2$) $\Rightarrow$ p_2$_3$ cnf(s2_type11$_6$, axiom)
(p_2$_2$ and q_1$_1$) $\Rightarrow$ q_1$_2$ cnf(s2_type12$_1$, axiom)
(q_2$_2$ and p_1$_1$) $\Rightarrow$ q_1$_2$ cnf(s2_type12$_2$, axiom)
(p_2$_3$ and q_1$_2$) $\Rightarrow$ q_1$_3$ cnf(s2_type12$_3$, axiom)
(q_2$_3$ and p_1$_2$) $\Rightarrow$ q_1$_3$ cnf(s2_type12$_4$, axiom)
(p_3$_3$ and q_2$_2$) $\Rightarrow$ q_2$_3$ cnf(s2_type12$_5$, axiom)
(q_3$_3$ and p_2$_2$) $\Rightarrow$ q_2$_3$ cnf(s2_type12$_6$, axiom)
p_1$_2$ $\Rightarrow$ p_1$_1$ cnf(s2_type21$_1$, axiom)
q_1$_2$ $\Rightarrow$ q_1$_1$ cnf(s2_type21$_2$, axiom)
p_1$_2$ $\Rightarrow$ p_2$_2$ cnf(s2_type22$_1$, axiom)
p_2$_3$ $\Rightarrow$ p_3$_3$ cnf(s2_type22$_2$, axiom)
q_1$_2$ $\Rightarrow$ q_2$_2$ cnf(s2_type22$_3$, axiom)
q_2$_3$ $\Rightarrow$ q_3$_3$ cnf(s2_type22$_4$, axiom)

SYN087-1.003.p Plaisted problem s(3,3)
p_0 $\Rightarrow$ $\neg\, q_0$ cnf(s3_goal$_1$, negated_conjecture)
(p_1 and p_2) $\Rightarrow$ p_0 cnf(s3_type11$_1$, axiom)
(q_1 and q_2) $\Rightarrow$ p_0 cnf(s3_type11$_2$, axiom)
(p_2 and p_3) $\Rightarrow$ p_1 cnf(s3_type11$_3$, axiom)
(q_2 and q_3) $\Rightarrow$ p_1 cnf(s3_type11$_4$, axiom)
(p_3 and p_4) $\Rightarrow$ p_2 cnf(s3_type11$_5$, axiom)
(q_3 and q_4) $\Rightarrow$ p_2 cnf(s3_type11$_6$, axiom)
(p_4 and p_5) $\Rightarrow$ p_3 cnf(s3_type11$_7$, axiom)
(q_4 and q_5) $\Rightarrow$ p_3 cnf(s3_type11$_8$, axiom)
(p_1 and q_2) $\Rightarrow$ q_0 cnf(s3_type12$_1$, axiom)
(q_1 and p_2) $\Rightarrow$ q_0 cnf(s3_type12$_2$, axiom)
(p_2 and q_3) $\Rightarrow$ q_1 cnf(s3_type12$_3$, axiom)
(q_2 and p_3) $\Rightarrow$ q_1 cnf(s3_type12$_4$, axiom)
(p_3 and q_4) $\Rightarrow$ q_2 cnf(s3_type12$_5$, axiom)

$(q_3$ and $p_4) \Rightarrow q_2$ cnf(s3_type12$_6$, axiom)
$(p_4$ and $q_5) \Rightarrow q_3$ cnf(s3_type12$_7$, axiom)
$(q_4$ and $p_5) \Rightarrow q_3$ cnf(s3_type12$_8$, axiom)
$p_2 \Rightarrow p_5$ cnf(s3_type2$_1$, axiom)
$p_3 \Rightarrow p_6$ cnf(s3_type2$_2$, axiom)
$q_2 \Rightarrow q_5$ cnf(s3_type2$_3$, axiom)
$q_3 \Rightarrow q_6$ cnf(s3_type2$_4$, axiom)

SYN088-1.010.p Plaisted problem s(4,10)
$\neg\, p(a,a,a,a,a,a,a,a,a,a)$ cnf(s4_goal$_1$, negated_conjecture)
$(q_1(x_1)$ and $q_2(x_2)$ and $q_3(x_3)$ and $q_4(x_4)$ and $q_5(x_5)$ and $q_6(x_6)$ and $q_7(x_7)$ and $q_8(x_8)$ and $q_9(x_9)$ and $q_{10}(x_{10})) \Rightarrow p(x_1,x_2,x_3,x_4,x_5,x_6,x_7,x_8,x_9,x_{10})$ cnf(s4$_1$, axiom)
$q_1(a)$ cnf(s4$_2$, axiom)
$q_1(b)$ cnf(s4$_3$, axiom)
$q_2(a)$ cnf(s4$_4$, axiom)
$q_2(b)$ cnf(s4$_5$, axiom)
$q_3(a)$ cnf(s4$_6$, axiom)
$q_3(b)$ cnf(s4$_7$, axiom)
$q_4(a)$ cnf(s4$_8$, axiom)
$q_4(b)$ cnf(s4$_9$, axiom)
$q_5(a)$ cnf(s4$_{10}$, axiom)
$q_5(b)$ cnf(s4$_{11}$, axiom)
$q_6(a)$ cnf(s4$_{12}$, axiom)
$q_6(b)$ cnf(s4$_{13}$, axiom)
$q_7(a)$ cnf(s4$_{14}$, axiom)
$q_7(b)$ cnf(s4$_{15}$, axiom)
$q_8(a)$ cnf(s4$_{16}$, axiom)
$q_8(b)$ cnf(s4$_{17}$, axiom)
$q_9(a)$ cnf(s4$_{18}$, axiom)
$q_9(b)$ cnf(s4$_{19}$, axiom)
$q_{10}(a)$ cnf(s4$_{20}$, axiom)
$q_{10}(b)$ cnf(s4$_{21}$, axiom)

SYN089-1.002.p Plaisted problem t(2,2)
$\neg$ p_1$_2$ cnf(s2_goal$_1$, negated_conjecture)
(p_2$_2$ and p_1$_1$) $\Rightarrow$ p_1$_2$ cnf(s2_type11$_1$, axiom)
(q_2$_2$ and q_1$_1$) $\Rightarrow$ p_1$_2$ cnf(s2_type11$_2$, axiom)
(p_2$_2$ and q_1$_1$) $\Rightarrow$ q_1$_2$ cnf(s2_type12$_1$, axiom)
(q_2$_2$ and p_1$_1$) $\Rightarrow$ q_1$_2$ cnf(s2_type12$_2$, axiom)
p_1$_2$ $\Rightarrow$ p_1$_1$ cnf(s2_type21$_1$, axiom)
q_1$_2$ $\Rightarrow$ q_1$_1$ cnf(s2_type21$_2$, axiom)
p_1$_2$ $\Rightarrow$ p_2$_2$ cnf(s2_type22$_1$, axiom)
q_1$_2$ $\Rightarrow$ q_2$_2$ cnf(s2_type22$_2$, axiom)
p_1$_1$ cnf(t2$_1$, axiom)
q_1$_1$ cnf(t2$_2$, axiom)
p_2$_2$ cnf(t2$_3$, axiom)
q_2$_2$ cnf(t2$_4$, axiom)

SYN091-1.003.p Plaisted problem sym(s(2,3))
$\neg$ p_1$_3$ cnf(s2_goal$_1$, negated_conjecture)
(p_2$_2$ and p_1$_1$) $\Rightarrow$ p_1$_2$ cnf(s2_type11$_1$, axiom)
(q_2$_2$ and q_1$_1$) $\Rightarrow$ p_1$_2$ cnf(s2_type11$_2$, axiom)
(p_2$_3$ and p_1$_2$) $\Rightarrow$ p_1$_3$ cnf(s2_type11$_3$, axiom)
(q_2$_3$ and q_1$_2$) $\Rightarrow$ p_1$_3$ cnf(s2_type11$_4$, axiom)
(p_3$_3$ and p_2$_2$) $\Rightarrow$ p_2$_3$ cnf(s2_type11$_5$, axiom)
(q_3$_3$ and q_2$_2$) $\Rightarrow$ p_2$_3$ cnf(s2_type11$_6$, axiom)
(p_2$_2$ and q_1$_1$) $\Rightarrow$ q_1$_2$ cnf(s2_type12$_1$, axiom)
(q_2$_2$ and p_1$_1$) $\Rightarrow$ q_1$_2$ cnf(s2_type12$_2$, axiom)
(p_2$_3$ and q_1$_2$) $\Rightarrow$ q_1$_3$ cnf(s2_type12$_3$, axiom)
(q_2$_3$ and p_1$_2$) $\Rightarrow$ q_1$_3$ cnf(s2_type12$_4$, axiom)
(p_3$_3$ and q_2$_2$) $\Rightarrow$ q_2$_3$ cnf(s2_type12$_5$, axiom)

$(\text{q\_3}_3 \text{ and } \text{p\_2}_2) \Rightarrow \text{q\_2}_3$ cnf(s2_type12$_6$, axiom)
$\text{p\_1}_2 \Rightarrow \text{p\_1}_1$ cnf(s2_type21$_1$, axiom)
$\text{q\_1}_2 \Rightarrow \text{q\_1}_1$ cnf(s2_type21$_2$, axiom)
$\text{p\_1}_2 \Rightarrow \text{p\_2}_2$ cnf(s2_type22$_1$, axiom)
$\text{p\_2}_3 \Rightarrow \text{p\_3}_3$ cnf(s2_type22$_2$, axiom)
$\text{q\_1}_2 \Rightarrow \text{q\_2}_2$ cnf(s2_type22$_3$, axiom)
$\text{q\_2}_3 \Rightarrow \text{q\_3}_3$ cnf(s2_type22$_4$, axiom)
sym_p_1_3 cnf(sym_s2_goal$_1$, axiom)
$\text{sym\_p\_1}_2 \Rightarrow (\text{sym\_p\_2}_2 \text{ or } \text{sym\_p\_1}_1)$ cnf(sym_s2_type11$_1$, axiom)
$\text{sym\_p\_1}_2 \Rightarrow (\text{sym\_q\_2}_2 \text{ or } \text{sym\_q\_1}_1)$ cnf(sym_s2_type11$_2$, axiom)
$\text{sym\_p\_1}_3 \Rightarrow (\text{sym\_p\_2}_3 \text{ or } \text{sym\_p\_1}_2)$ cnf(sym_s2_type11$_3$, axiom)
$\text{sym\_p\_1}_3 \Rightarrow (\text{sym\_q\_2}_3 \text{ or } \text{sym\_q\_1}_2)$ cnf(sym_s2_type11$_4$, axiom)
$\text{sym\_p\_2}_3 \Rightarrow (\text{sym\_p\_3}_3 \text{ or } \text{sym\_p\_2}_2)$ cnf(sym_s2_type11$_5$, axiom)
$\text{sym\_p\_2}_3 \Rightarrow (\text{sym\_q\_3}_3 \text{ or } \text{sym\_q\_2}_2)$ cnf(sym_s2_type11$_6$, axiom)
$\text{sym\_q\_1}_2 \Rightarrow (\text{sym\_p\_2}_2 \text{ or } \text{sym\_q\_1}_1)$ cnf(sym_s2_type12$_1$, axiom)
$\text{sym\_q\_1}_2 \Rightarrow (\text{sym\_q\_2}_2 \text{ or } \text{sym\_p\_1}_1)$ cnf(sym_s2_type12$_2$, axiom)
$\text{sym\_q\_1}_3 \Rightarrow (\text{sym\_p\_2}_3 \text{ or } \text{sym\_q\_1}_2)$ cnf(sym_s2_type12$_3$, axiom)
$\text{sym\_q\_1}_3 \Rightarrow (\text{sym\_q\_2}_3 \text{ or } \text{sym\_p\_1}_2)$ cnf(sym_s2_type12$_4$, axiom)
$\text{sym\_q\_2}_3 \Rightarrow (\text{sym\_p\_3}_3 \text{ or } \text{sym\_q\_2}_2)$ cnf(sym_s2_type12$_5$, axiom)
$\text{sym\_q\_2}_3 \Rightarrow (\text{sym\_q\_3}_3 \text{ or } \text{sym\_p\_2}_2)$ cnf(sym_s2_type12$_6$, axiom)
$\text{sym\_p\_1}_1 \Rightarrow \text{sym\_p\_1}_2$ cnf(sym_s2_type21$_1$, axiom)
$\text{sym\_q\_1}_1 \Rightarrow \text{sym\_q\_1}_2$ cnf(sym_s2_type21$_2$, axiom)
$\text{sym\_p\_2}_2 \Rightarrow \text{sym\_p\_1}_2$ cnf(sym_s2_type22$_1$, axiom)
$\text{sym\_p\_3}_3 \Rightarrow \text{sym\_p\_2}_3$ cnf(sym_s2_type22$_2$, axiom)
$\text{sym\_q\_2}_2 \Rightarrow \text{sym\_q\_1}_2$ cnf(sym_s2_type22$_3$, axiom)
$\text{sym\_q\_3}_3 \Rightarrow \text{sym\_q\_2}_3$ cnf(sym_s2_type22$_4$, axiom)

SYN092-1.003.p Plaisted problem sym(s(3,3))
$p_0 \Rightarrow \neg\, q_0$ cnf(s3_goal$_1$, negated_conjecture)
$(p_1 \text{ and } p_2) \Rightarrow p_0$ cnf(s3_type11$_1$, axiom)
$(q_1 \text{ and } q_2) \Rightarrow p_0$ cnf(s3_type11$_2$, axiom)
$(p_2 \text{ and } p_3) \Rightarrow p_1$ cnf(s3_type11$_3$, axiom)
$(q_2 \text{ and } q_3) \Rightarrow p_1$ cnf(s3_type11$_4$, axiom)
$(p_3 \text{ and } p_4) \Rightarrow p_2$ cnf(s3_type11$_5$, axiom)
$(q_3 \text{ and } q_4) \Rightarrow p_2$ cnf(s3_type11$_6$, axiom)
$(p_4 \text{ and } p_5) \Rightarrow p_3$ cnf(s3_type11$_7$, axiom)
$(q_4 \text{ and } q_5) \Rightarrow p_3$ cnf(s3_type11$_8$, axiom)
$(p_1 \text{ and } q_2) \Rightarrow q_0$ cnf(s3_type12$_1$, axiom)
$(q_1 \text{ and } p_2) \Rightarrow q_0$ cnf(s3_type12$_2$, axiom)
$(p_2 \text{ and } q_3) \Rightarrow q_1$ cnf(s3_type12$_3$, axiom)
$(q_2 \text{ and } p_3) \Rightarrow q_1$ cnf(s3_type12$_4$, axiom)
$(p_3 \text{ and } q_4) \Rightarrow q_2$ cnf(s3_type12$_5$, axiom)
$(q_3 \text{ and } p_4) \Rightarrow q_2$ cnf(s3_type12$_6$, axiom)
$(p_4 \text{ and } q_5) \Rightarrow q_3$ cnf(s3_type12$_7$, axiom)
$(q_4 \text{ and } p_5) \Rightarrow q_3$ cnf(s3_type12$_8$, axiom)
$p_2 \Rightarrow p_5$ cnf(s3_type2$_1$, axiom)
$p_3 \Rightarrow p_6$ cnf(s3_type2$_2$, axiom)
$q_2 \Rightarrow q_5$ cnf(s3_type2$_3$, axiom)
$q_3 \Rightarrow q_6$ cnf(s3_type2$_4$, axiom)
$\text{sym\_p}_0 \text{ or } \text{sym\_q}_0$ cnf(sym_s3_goal$_1$, axiom)
$\text{sym\_p}_0 \Rightarrow (\text{sym\_p}_1 \text{ or } \text{sym\_p}_2)$ cnf(sym_s3_type11$_1$, axiom)
$\text{sym\_p}_0 \Rightarrow (\text{sym\_q}_1 \text{ or } \text{sym\_q}_2)$ cnf(sym_s3_type11$_2$, axiom)
$\text{sym\_p}_1 \Rightarrow (\text{sym\_p}_2 \text{ or } \text{sym\_p}_3)$ cnf(sym_s3_type11$_3$, axiom)
$\text{sym\_p}_1 \Rightarrow (\text{sym\_q}_2 \text{ or } \text{sym\_q}_3)$ cnf(sym_s3_type11$_4$, axiom)
$\text{sym\_p}_2 \Rightarrow (\text{sym\_p}_3 \text{ or } \text{sym\_p}_4)$ cnf(sym_s3_type11$_5$, axiom)
$\text{sym\_p}_2 \Rightarrow (\text{sym\_q}_3 \text{ or } \text{sym\_q}_4)$ cnf(sym_s3_type11$_6$, axiom)
$\text{sym\_p}_3 \Rightarrow (\text{sym\_p}_4 \text{ or } \text{sym\_p}_5)$ cnf(sym_s3_type11$_7$, axiom)
$\text{sym\_p}_3 \Rightarrow (\text{sym\_q}_4 \text{ or } \text{sym\_q}_5)$ cnf(sym_s3_type11$_8$, axiom)
$\text{sym\_q}_0 \Rightarrow (\text{sym\_p}_1 \text{ or } \text{sym\_q}_2)$ cnf(sym_s3_type12$_1$, axiom)
$\text{sym\_q}_0 \Rightarrow (\text{sym\_q}_1 \text{ or } \text{sym\_p}_2)$ cnf(sym_s3_type12$_2$, axiom)

$\text{sym\_q}_1 \Rightarrow (\text{sym\_p}_2 \text{ or } \text{sym\_q}_3)$ cnf(sym_s3_type12$_3$, axiom)
$\text{sym\_q}_1 \Rightarrow (\text{sym\_q}_2 \text{ or } \text{sym\_p}_3)$ cnf(sym_s3_type12$_4$, axiom)
$\text{sym\_q}_2 \Rightarrow (\text{sym\_p}_3 \text{ or } \text{sym\_q}_4)$ cnf(sym_s3_type12$_5$, axiom)
$\text{sym\_q}_2 \Rightarrow (\text{sym\_q}_3 \text{ or } \text{sym\_p}_4)$ cnf(sym_s3_type12$_6$, axiom)
$\text{sym\_q}_3 \Rightarrow (\text{sym\_p}_4 \text{ or } \text{sym\_q}_5)$ cnf(sym_s3_type12$_7$, axiom)
$\text{sym\_q}_3 \Rightarrow (\text{sym\_q}_4 \text{ or } \text{sym\_p}_5)$ cnf(sym_s3_type12$_8$, axiom)
$\text{sym\_p}_5 \Rightarrow \text{sym\_p}_2$ cnf(sym_s3_type2$_1$, axiom)
$\text{sym\_p}_6 \Rightarrow \text{sym\_p}_3$ cnf(sym_s3_type2$_2$, axiom)
$\text{sym\_q}_5 \Rightarrow \text{sym\_q}_2$ cnf(sym_s3_type2$_3$, axiom)
$\text{sym\_q}_6 \Rightarrow \text{sym\_q}_3$ cnf(sym_s3_type2$_4$, axiom)

SYN093-1.002.p Plaisted problem u(t(2,2))
$\text{p\_1}_2 \Rightarrow u_1$ cnf(u_s2_goal$_1$, negated_conjecture)
$\neg\, u_1$ cnf(u_1_s2_goal$_1$, axiom)
$(\text{p\_2}_2 \text{ and } \text{p\_1}_1) \Rightarrow (u_2 \text{ or } \text{p\_1}_2)$ cnf(u_s2_type11$_1$, axiom)
$u_2 \Rightarrow \text{p\_1}_2$ cnf(u_2_s2_type11$_1$, axiom)
$(\text{q\_2}_2 \text{ and } \text{q\_1}_1) \Rightarrow (u_3 \text{ or } \text{p\_1}_2)$ cnf(u_s2_type11$_2$, axiom)
$u_3 \Rightarrow \text{p\_1}_2$ cnf(u_3_s2_type11$_2$, axiom)
$(\text{p\_2}_2 \text{ and } \text{q\_1}_1) \Rightarrow (u_4 \text{ or } \text{q\_1}_2)$ cnf(u_s2_type12$_1$, axiom)
$u_4 \Rightarrow \text{q\_1}_2$ cnf(u_4_s2_type12$_1$, axiom)
$(\text{q\_2}_2 \text{ and } \text{p\_1}_1) \Rightarrow (u_5 \text{ or } \text{q\_1}_2)$ cnf(u_s2_type12$_2$, axiom)
$u_5 \Rightarrow \text{q\_1}_2$ cnf(u_5_s2_type12$_2$, axiom)
$\text{p\_1}_2 \Rightarrow (u_6 \text{ or } \text{p\_1}_1)$ cnf(u_s2_type21$_1$, axiom)
$u_6 \Rightarrow \text{p\_1}_1$ cnf(u_6_s2_type21$_1$, axiom)
$\text{q\_1}_2 \Rightarrow (u_7 \text{ or } \text{q\_1}_1)$ cnf(u_s2_type21$_2$, axiom)
$u_7 \Rightarrow \text{q\_1}_1$ cnf(u_7_s2_type21$_2$, axiom)
$\text{p\_1}_2 \Rightarrow (u_8 \text{ or } \text{p\_2}_2)$ cnf(u_s2_type22$_1$, axiom)
$u_8 \Rightarrow \text{p\_2}_2$ cnf(u_8_s2_type22$_1$, axiom)
$\text{q\_1}_2 \Rightarrow (u_9 \text{ or } \text{q\_2}_2)$ cnf(u_s2_type22$_2$, axiom)
$u_9 \Rightarrow \text{q\_2}_2$ cnf(u_9_s2_type22$_2$, axiom)
$u_{10} \text{ or } \text{p\_1}_1$ cnf(u_t2$_1$, axiom)
$u_{10} \Rightarrow \text{p\_1}_1$ cnf(u_10_t2$_1$, axiom)
$u_{11} \text{ or } \text{q\_1}_1$ cnf(u_t2$_2$, axiom)
$u_{11} \Rightarrow \text{q\_1}_1$ cnf(u_11_t2$_2$, axiom)
$u_{12} \text{ or } \text{p\_2}_2$ cnf(u_t2$_3$, axiom)
$u_{12} \Rightarrow \text{p\_2}_2$ cnf(u_12_t2$_3$, axiom)
$u_{13} \text{ or } \text{q\_2}_2$ cnf(u_t2$_4$, axiom)
$u_{13} \Rightarrow \text{q\_2}_2$ cnf(u_13_t2$_4$, axiom)

SYN095-1.002.p Plaisted problem m(t(2,2))
$\neg\, \text{p\_1}_2(x)$ cnf(m_s2_goal$_1$, negated_conjecture)
$(\text{p\_2}_2(x) \text{ and } \text{p\_1}_1(x)) \Rightarrow \text{p\_1}_2(x)$ cnf(m_s2_type11$_1$, axiom)
$(\text{q\_2}_2(x) \text{ and } \text{q\_1}_1(x)) \Rightarrow \text{p\_1}_2(x)$ cnf(m_s2_type11$_2$, axiom)
$(\text{p\_2}_2(x) \text{ and } \text{q\_1}_1(x)) \Rightarrow \text{q\_1}_2(x)$ cnf(m_s2_type12$_1$, axiom)
$(\text{q\_2}_2(x) \text{ and } \text{p\_1}_1(x)) \Rightarrow \text{q\_1}_2(x)$ cnf(m_s2_type12$_2$, axiom)
$\text{p\_1}_2(x) \Rightarrow \text{p\_1}_1(x)$ cnf(m_s2_type21$_1$, axiom)
$\text{q\_1}_2(x) \Rightarrow \text{q\_1}_1(x)$ cnf(m_s2_type21$_2$, axiom)
$\text{p\_1}_2(x) \Rightarrow \text{p\_2}_2(x)$ cnf(m_s2_type22$_1$, axiom)
$\text{q\_1}_2(x) \Rightarrow \text{q\_2}_2(x)$ cnf(m_s2_type22$_2$, axiom)
$\text{p\_1}_1(a)$ cnf(m_t2$_1$, axiom)
$\text{q\_1}_1(a)$ cnf(m_t2$_2$, axiom)
$\text{p\_2}_2(a)$ cnf(m_t2$_3$, axiom)
$\text{q\_2}_2(a)$ cnf(m_t2$_4$, axiom)

SYN097-1.002.p Plaisted problem sym(u(t(2,2)))
$\text{p\_1}_2 \Rightarrow u_1$ cnf(u_s2_goal$_1$, negated_conjecture)
$\neg\, u_1$ cnf(u_1_s2_goal$_1$, axiom)
$(\text{p\_2}_2 \text{ and } \text{p\_1}_1) \Rightarrow (u_2 \text{ or } \text{p\_1}_2)$ cnf(u_s2_type11$_1$, axiom)
$u_2 \Rightarrow \text{p\_1}_2$ cnf(u_2_s2_type11$_1$, axiom)
$(\text{q\_2}_2 \text{ and } \text{q\_1}_1) \Rightarrow (u_3 \text{ or } \text{p\_1}_2)$ cnf(u_s2_type11$_2$, axiom)
$u_3 \Rightarrow \text{p\_1}_2$ cnf(u_3_s2_type11$_2$, axiom)

$(\text{p\_2}_2 \text{ and } \text{q\_1}_1) \Rightarrow (u_4 \text{ or } \text{q\_1}_2)$ cnf(u_s2_type12$_1$, axiom)
$u_4 \Rightarrow \text{q\_1}_2$ cnf(u_4_s2_type12$_1$, axiom)
$(\text{q\_2}_2 \text{ and } \text{p\_1}_1) \Rightarrow (u_5 \text{ or } \text{q\_1}_2)$ cnf(u_s2_type12$_2$, axiom)
$u_5 \Rightarrow \text{q\_1}_2$ cnf(u_5_s2_type12$_2$, axiom)
$\text{p\_1}_2 \Rightarrow (u_6 \text{ or } \text{p\_1}_1)$ cnf(u_s2_type21$_1$, axiom)
$u_6 \Rightarrow \text{p\_1}_1$ cnf(u_6_s2_type21$_1$, axiom)
$\text{q\_1}_2 \Rightarrow (u_7 \text{ or } \text{q\_1}_1)$ cnf(u_s2_type21$_2$, axiom)
$u_7 \Rightarrow \text{q\_1}_1$ cnf(u_7_s2_type21$_2$, axiom)
$\text{p\_1}_2 \Rightarrow (u_8 \text{ or } \text{p\_2}_2)$ cnf(u_s2_type22$_1$, axiom)
$u_8 \Rightarrow \text{p\_2}_2$ cnf(u_8_s2_type22$_1$, axiom)
$\text{q\_1}_2 \Rightarrow (u_9 \text{ or } \text{q\_2}_2)$ cnf(u_s2_type22$_2$, axiom)
$u_9 \Rightarrow \text{q\_2}_2$ cnf(u_9_s2_type22$_2$, axiom)
u_{10} or p_1_1 cnf(u_t2$_1$, axiom)
$u_{10} \Rightarrow \text{p\_1}_1$ cnf(u_10_t2$_1$, axiom)
u_{11} or q_1_1 cnf(u_t2$_2$, axiom)
$u_{11} \Rightarrow \text{q\_1}_1$ cnf(u_11_t2$_2$, axiom)
u_{12} or p_2_2 cnf(u_t2$_3$, axiom)
$u_{12} \Rightarrow \text{p\_2}_2$ cnf(u_12_t2$_3$, axiom)
u_{13} or q_2_2 cnf(u_t2$_4$, axiom)
$u_{13} \Rightarrow \text{q\_2}_2$ cnf(u_13_t2$_4$, axiom)
$\text{sym\_u}_1 \Rightarrow \text{sym\_p\_1}_2$ cnf(sym_u_s2_goal$_1$, axiom)
sym_u_1 cnf(sym_u_1_s2_goal$_1$, axiom)
$(\text{sym\_u}_2 \text{ and } \text{sym\_p\_1}_2) \Rightarrow (\text{sym\_p\_2}_2 \text{ or } \text{sym\_p\_1}_1)$ cnf(sym_u_s2_type11$_1$, axiom)
$\text{sym\_p\_1}_2 \Rightarrow \text{sym\_u}_2$ cnf(sym_u_2_s2_type11$_1$, axiom)
$(\text{sym\_u}_3 \text{ and } \text{sym\_p\_1}_2) \Rightarrow (\text{sym\_q\_2}_2 \text{ or } \text{sym\_q\_1}_1)$ cnf(sym_u_s2_type11$_2$, axiom)
$\text{sym\_p\_1}_2 \Rightarrow \text{sym\_u}_3$ cnf(sym_u_3_s2_type11$_2$, axiom)
$(\text{sym\_u}_4 \text{ and } \text{sym\_q\_1}_2) \Rightarrow (\text{sym\_p\_2}_2 \text{ or } \text{sym\_q\_1}_1)$ cnf(sym_u_s2_type12$_1$, axiom)
$\text{sym\_q\_1}_2 \Rightarrow \text{sym\_u}_4$ cnf(sym_u_4_s2_type12$_1$, axiom)
$(\text{sym\_u}_5 \text{ and } \text{sym\_q\_1}_2) \Rightarrow (\text{sym\_q\_2}_2 \text{ or } \text{sym\_p\_1}_1)$ cnf(sym_u_s2_type12$_2$, axiom)
$\text{sym\_q\_1}_2 \Rightarrow \text{sym\_u}_5$ cnf(sym_u_5_s2_type12$_2$, axiom)
$(\text{sym\_u}_6 \text{ and } \text{sym\_p\_1}_1) \Rightarrow \text{sym\_p\_1}_2$ cnf(sym_u_s2_type21$_1$, axiom)
$\text{sym\_p\_1}_1 \Rightarrow \text{sym\_u}_6$ cnf(sym_u_6_s2_type21$_1$, axiom)
$(\text{sym\_u}_7 \text{ and } \text{sym\_q\_1}_1) \Rightarrow \text{sym\_q\_1}_2$ cnf(sym_u_s2_type21$_2$, axiom)
$\text{sym\_q\_1}_1 \Rightarrow \text{sym\_u}_7$ cnf(sym_u_7_s2_type21$_2$, axiom)
$(\text{sym\_u}_8 \text{ and } \text{sym\_p\_2}_2) \Rightarrow \text{sym\_p\_1}_2$ cnf(sym_u_s2_type22$_1$, axiom)
$\text{sym\_p\_2}_2 \Rightarrow \text{sym\_u}_8$ cnf(sym_u_8_s2_type22$_1$, axiom)
$(\text{sym\_u}_9 \text{ and } \text{sym\_q\_2}_2) \Rightarrow \text{sym\_q\_1}_2$ cnf(sym_u_s2_type22$_2$, axiom)
$\text{sym\_q\_2}_2 \Rightarrow \text{sym\_u}_9$ cnf(sym_u_9_s2_type22$_2$, axiom)
$\text{sym\_u}_{10} \Rightarrow \neg\,\text{sym\_p\_1}_1$ cnf(sym_u_t2$_1$, axiom)
$\text{sym\_p\_1}_1 \Rightarrow \text{sym\_u}_{10}$ cnf(sym_u_10_t2$_1$, axiom)
$\text{sym\_u}_{11} \Rightarrow \neg\,\text{sym\_q\_1}_1$ cnf(sym_u_t2$_2$, axiom)
$\text{sym\_q\_1}_1 \Rightarrow \text{sym\_u}_{11}$ cnf(sym_u_11_t2$_2$, axiom)
$\text{sym\_u}_{12} \Rightarrow \neg\,\text{sym\_p\_2}_2$ cnf(sym_u_t2$_3$, axiom)
$\text{sym\_p\_2}_2 \Rightarrow \text{sym\_u}_{12}$ cnf(sym_u_12_t2$_3$, axiom)
$\text{sym\_u}_{13} \Rightarrow \neg\,\text{sym\_q\_2}_2$ cnf(sym_u_t2$_4$, axiom)
$\text{sym\_q\_2}_2 \Rightarrow \text{sym\_u}_{13}$ cnf(sym_u_13_t2$_4$, axiom)

SYN099-1.003.p Plaisted problem sym(m(t(2,3)))
$\neg\,\text{p\_1}_3(x)$ cnf(m_s2_goal$_1$, negated_conjecture)
$(\text{p\_2}_2(x) \text{ and } \text{p\_1}_1(x)) \Rightarrow \text{p\_1}_2(x)$ cnf(m_s2_type11$_1$, axiom)
$(\text{q\_2}_2(x) \text{ and } \text{q\_1}_1(x)) \Rightarrow \text{p\_1}_2(x)$ cnf(m_s2_type11$_2$, axiom)
$(\text{p\_2}_3(x) \text{ and } \text{p\_1}_2(x)) \Rightarrow \text{p\_1}_3(x)$ cnf(m_s2_type11$_3$, axiom)
$(\text{q\_2}_3(x) \text{ and } \text{q\_1}_2(x)) \Rightarrow \text{p\_1}_3(x)$ cnf(m_s2_type11$_4$, axiom)
$(\text{p\_3}_3(x) \text{ and } \text{p\_2}_2(x)) \Rightarrow \text{p\_2}_3(x)$ cnf(m_s2_type11$_5$, axiom)
$(\text{q\_3}_3(x) \text{ and } \text{q\_2}_2(x)) \Rightarrow \text{p\_2}_3(x)$ cnf(m_s2_type11$_6$, axiom)
$(\text{p\_2}_2(x) \text{ and } \text{q\_1}_1(x)) \Rightarrow \text{q\_1}_2(x)$ cnf(m_s2_type12$_1$, axiom)
$(\text{q\_2}_2(x) \text{ and } \text{p\_1}_1(x)) \Rightarrow \text{q\_1}_2(x)$ cnf(m_s2_type12$_2$, axiom)
$(\text{p\_2}_3(x) \text{ and } \text{q\_1}_2(x)) \Rightarrow \text{q\_1}_3(x)$ cnf(m_s2_type12$_3$, axiom)
$(\text{q\_2}_3(x) \text{ and } \text{p\_1}_2(x)) \Rightarrow \text{q\_1}_3(x)$ cnf(m_s2_type12$_4$, axiom)
$(\text{p\_3}_3(x) \text{ and } \text{q\_2}_2(x)) \Rightarrow \text{q\_2}_3(x)$ cnf(m_s2_type12$_5$, axiom)

$(\text{q\_3}_3(x)$ and $\text{p\_2}_2(x)) \Rightarrow \text{q\_2}_3(x)$ cnf(m_s2_type12_6, axiom)
$\text{p\_1}_2(x) \Rightarrow \text{p\_1}_1(x)$ cnf(m_s2_type21_1, axiom)
$\text{q\_1}_2(x) \Rightarrow \text{q\_1}_1(x)$ cnf(m_s2_type21_2, axiom)
$\text{p\_1}_2(x) \Rightarrow \text{p\_2}_2(x)$ cnf(m_s2_type22_1, axiom)
$\text{p\_2}_3(x) \Rightarrow \text{p\_3}_3(x)$ cnf(m_s2_type22_2, axiom)
$\text{q\_1}_2(x) \Rightarrow \text{q\_2}_2(x)$ cnf(m_s2_type22_3, axiom)
$\text{q\_2}_3(x) \Rightarrow \text{q\_3}_3(x)$ cnf(m_s2_type22_4, axiom)
$\text{p\_1}_1(a)$ cnf(m_t2_1, axiom)
$\text{q\_1}_1(a)$ cnf(m_t2_2, axiom)
$\text{p\_2}_2(a)$ cnf(m_t2_3, axiom)
$\text{q\_2}_2(a)$ cnf(m_t2_4, axiom)
$\text{p\_3}_3(a)$ cnf(m_t2_5, axiom)
$\text{q\_3}_3(a)$ cnf(m_t2_6, axiom)
$\text{sym\_p\_1}_3(x)$ cnf(sym_m_s2_goal_1, axiom)
$\text{sym\_p\_1}_2(x) \Rightarrow (\text{sym\_p\_2}_2(x)$ or $\text{sym\_p\_1}_1(x))$ cnf(sym_m_s2_type11_1, axiom)
$\text{sym\_p\_1}_2(x) \Rightarrow (\text{sym\_q\_2}_2(x)$ or $\text{sym\_q\_1}_1(x))$ cnf(sym_m_s2_type11_2, axiom)
$\text{sym\_p\_1}_3(x) \Rightarrow (\text{sym\_p\_2}_3(x)$ or $\text{sym\_p\_1}_2(x))$ cnf(sym_m_s2_type11_3, axiom)
$\text{sym\_p\_1}_3(x) \Rightarrow (\text{sym\_q\_2}_3(x)$ or $\text{sym\_q\_1}_2(x))$ cnf(sym_m_s2_type11_4, axiom)
$\text{sym\_p\_2}_3(x) \Rightarrow (\text{sym\_p\_3}_3(x)$ or $\text{sym\_p\_2}_2(x))$ cnf(sym_m_s2_type11_5, axiom)
$\text{sym\_p\_2}_3(x) \Rightarrow (\text{sym\_q\_3}_3(x)$ or $\text{sym\_q\_2}_2(x))$ cnf(sym_m_s2_type11_6, axiom)
$\text{sym\_q\_1}_2(x) \Rightarrow (\text{sym\_p\_2}_2(x)$ or $\text{sym\_q\_1}_1(x))$ cnf(sym_m_s2_type12_1, axiom)
$\text{sym\_q\_1}_2(x) \Rightarrow (\text{sym\_q\_2}_2(x)$ or $\text{sym\_p\_1}_1(x))$ cnf(sym_m_s2_type12_2, axiom)
$\text{sym\_q\_1}_3(x) \Rightarrow (\text{sym\_p\_2}_3(x)$ or $\text{sym\_q\_1}_2(x))$ cnf(sym_m_s2_type12_3, axiom)
$\text{sym\_q\_1}_3(x) \Rightarrow (\text{sym\_q\_2}_3(x)$ or $\text{sym\_p\_1}_2(x))$ cnf(sym_m_s2_type12_4, axiom)
$\text{sym\_q\_2}_3(x) \Rightarrow (\text{sym\_p\_3}_3(x)$ or $\text{sym\_q\_2}_2(x))$ cnf(sym_m_s2_type12_5, axiom)
$\text{sym\_q\_2}_3(x) \Rightarrow (\text{sym\_q\_3}_3(x)$ or $\text{sym\_p\_2}_2(x))$ cnf(sym_m_s2_type12_6, axiom)
$\text{sym\_p\_1}_1(x) \Rightarrow \text{sym\_p\_1}_2(x)$ cnf(sym_m_s2_type21_1, axiom)
$\text{sym\_q\_1}_1(x) \Rightarrow \text{sym\_q\_1}_2(x)$ cnf(sym_m_s2_type21_2, axiom)
$\text{sym\_p\_2}_2(x) \Rightarrow \text{sym\_p\_1}_2(x)$ cnf(sym_m_s2_type22_1, axiom)
$\text{sym\_p\_3}_3(x) \Rightarrow \text{sym\_p\_2}_3(x)$ cnf(sym_m_s2_type22_2, axiom)
$\text{sym\_q\_2}_2(x) \Rightarrow \text{sym\_q\_1}_2(x)$ cnf(sym_m_s2_type22_3, axiom)
$\text{sym\_q\_3}_3(x) \Rightarrow \text{sym\_q\_2}_3(x)$ cnf(sym_m_s2_type22_4, axiom)
$\neg\, \text{sym\_p\_1}_1(a)$ cnf(sym_m_t2_1, axiom)
$\neg\, \text{sym\_q\_1}_1(a)$ cnf(sym_m_t2_2, axiom)
$\neg\, \text{sym\_p\_2}_2(a)$ cnf(sym_m_t2_3, axiom)
$\neg\, \text{sym\_q\_2}_2(a)$ cnf(sym_m_t2_4, axiom)
$\neg\, \text{sym\_p\_3}_3(a)$ cnf(sym_m_t2_5, axiom)
$\neg\, \text{sym\_q\_3}_3(a)$ cnf(sym_m_t2_6, axiom)

SYN101-1.002.002.p Plaisted problem n(t(2,2),2)
$\neg\, \text{p\_1}_2(a, a)$ cnf(n_s2_goal_1, negated_conjecture)
$(\text{p\_2}_2(x_1, x_2)$ and $\text{p\_1}_1(x_1, x_2)) \Rightarrow \text{p\_1}_2(x_1, x_2)$ cnf(n_s2_type11_1, axiom)
$(\text{q\_2}_2(x_1, x_2)$ and $\text{q\_1}_1(x_1, x_2)) \Rightarrow \text{p\_1}_2(x_1, x_2)$ cnf(n_s2_type11_2, axiom)
$(\text{p\_2}_2(x_1, x_2)$ and $\text{q\_1}_1(x_1, x_2)) \Rightarrow \text{q\_1}_2(x_1, x_2)$ cnf(n_s2_type12_1, axiom)
$(\text{q\_2}_2(x_1, x_2)$ and $\text{p\_1}_1(x_1, x_2)) \Rightarrow \text{q\_1}_2(x_1, x_2)$ cnf(n_s2_type12_2, axiom)
$\text{p\_1}_2(x_1, x_2) \Rightarrow \text{p\_1}_1(x_1, x_2)$ cnf(n_s2_type21_1, axiom)
$\text{q\_1}_2(x_1, x_2) \Rightarrow \text{q\_1}_1(x_1, x_2)$ cnf(n_s2_type21_2, axiom)
$\text{p\_1}_2(x_1, x_2) \Rightarrow \text{p\_2}_2(x_1, x_2)$ cnf(n_s2_type22_1, axiom)
$\text{q\_1}_2(x_1, x_2) \Rightarrow \text{q\_2}_2(x_1, x_2)$ cnf(n_s2_type22_2, axiom)
$(\text{nq}_1(x_1)$ and $\text{nq}_2(x_2)) \Rightarrow \text{p\_1}_1(x_1, x_2)$ cnf(n_t2_1, axiom)
$(\text{nq}_1(x_1)$ and $\text{nq}_2(x_2)) \Rightarrow \text{q\_1}_1(x_1, x_2)$ cnf(n_t2_2, axiom)
$(\text{nq}_1(x_1)$ and $\text{nq}_2(x_2)) \Rightarrow \text{p\_2}_2(x_1, x_2)$ cnf(n_t2_3, axiom)
$(\text{nq}_1(x_1)$ and $\text{nq}_2(x_2)) \Rightarrow \text{q\_2}_2(x_1, x_2)$ cnf(n_t2_4, axiom)
$\text{nq}_1(a)$ cnf(n_1, axiom)
$\text{nq}_1(b)$ cnf(n_2, axiom)
$\text{nq}_2(a)$ cnf(n_3, axiom)
$\text{nq}_2(b)$ cnf(n_4, axiom)

SYN103-1.p RPT63 synthetic problem 1 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')

$\neg\, k_0(b)$ cnf(prove_this, negated_conjecture)

SYN104-1.p RPT63 synthetic problem 2 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_0(e)$ cnf(prove_this, negated_conjecture)

SYN105-1.p RPT63 synthetic problem 3 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_1(b)$ cnf(prove_this, negated_conjecture)

SYN106-1.p RPT63 synthetic problem 4 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_1(e)$ cnf(prove_this, negated_conjecture)

SYN107-1.p RPT63 synthetic problem 5 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_2(x, d)$ cnf(prove_this, negated_conjecture)

SYN108-1.p RPT63 synthetic problem 6 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_2(a, x)$ cnf(prove_this, negated_conjecture)

SYN109-1.p RPT63 synthetic problem 7 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_2(b, c)$ cnf(prove_this, negated_conjecture)

SYN110-1.p RPT63 synthetic problem 8 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_2(c, a)$ cnf(prove_this, negated_conjecture)

SYN111-1.p RPT63 synthetic problem 9 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_2(c, b)$ cnf(prove_this, negated_conjecture)

SYN112-1.p RPT63 synthetic problem 10 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_2(e, x)$ cnf(prove_this, negated_conjecture)

SYN113-1.p RPT63 synthetic problem 11 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_2(e, d)$ cnf(prove_this, negated_conjecture)

SYN114-1.p RPT63 synthetic problem 12 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_3(x, x, b)$ cnf(prove_this, negated_conjecture)

SYN115-1.p RPT63 synthetic problem 13 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_4(c)$ cnf(prove_this, negated_conjecture)

SYN116-1.p RPT63 synthetic problem 14 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_5(b)$ cnf(prove_this, negated_conjecture)

SYN117-1.p RPT63 synthetic problem 15 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, k_5(e)$ cnf(prove_this, negated_conjecture)

SYN118-1.p RPT63 synthetic problem 16 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_0(a)$ cnf(prove_this, negated_conjecture)

SYN119-1.p RPT63 synthetic problem 17 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_0(c)$ cnf(prove_this, negated_conjecture)

SYN120-1.p RPT63 synthetic problem 18 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_1(e, e)$ cnf(prove_this, negated_conjecture)

SYN121-1.p RPT63 synthetic problem 19 (quasi-uniform distribution)

include('Axioms/SYN001-0.ax')
$\neg\, l_2(a, b)$ cnf(prove_this, negated_conjecture)

SYN122-1.p RPT63 synthetic problem 20 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_2(b, e)$ cnf(prove_this, negated_conjecture)

SYN123-1.p RPT63 synthetic problem 21 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_2(d, d)$ cnf(prove_this, negated_conjecture)

SYN124-1.p RPT63 synthetic problem 22 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(a, a)$ cnf(prove_this, negated_conjecture)

SYN125-1.p RPT63 synthetic problem 23 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(e, c)$ cnf(prove_this, negated_conjecture)

SYN126-1.p RPT63 synthetic problem 24 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_4(b)$ cnf(prove_this, negated_conjecture)

SYN127-1.p RPT63 synthetic problem 25 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_4(e)$ cnf(prove_this, negated_conjecture)

SYN128-1.p RPT63 synthetic problem 26 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_5(c)$ cnf(prove_this, negated_conjecture)

SYN129-1.p RPT63 synthetic problem 27 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_5(e)$ cnf(prove_this, negated_conjecture)

SYN130-1.p RPT63 synthetic problem 28 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_0(x, y, b)$ cnf(prove_this, negated_conjecture)

SYN131-1.p RPT63 synthetic problem 29 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_0(x, y, e)$ cnf(prove_this, negated_conjecture)

SYN132-1.p RPT63 synthetic problem 30 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_0(x, e, a)$ cnf(prove_this, negated_conjecture)

SYN133-1.p RPT63 synthetic problem 31 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_0(d, x, d)$ cnf(prove_this, negated_conjecture)

SYN134-1.p RPT63 synthetic problem 32 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_2(d)$ cnf(prove_this, negated_conjecture)

SYN135-1.p RPT63 synthetic problem 33 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_3(x, y, a)$ cnf(prove_this, negated_conjecture)

SYN136-1.p RPT63 synthetic problem 34 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_3(x, a, a)$ cnf(prove_this, negated_conjecture)

SYN137-1.p RPT63 synthetic problem 35 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_3(b, c, b)$ cnf(prove_this, negated_conjecture)

SYN138-1.p RPT63 synthetic problem 36 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_3(c, e, c)$ cnf(prove_this, negated_conjecture)

SYN139-1.p RPT63 synthetic problem 37 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_4(a, a)$ cnf(prove_this, negated_conjecture)

SYN140-1.p RPT63 synthetic problem 38 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_4(b, x)$ cnf(prove_this, negated_conjecture)

SYN141-1.p RPT63 synthetic problem 39 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_5(c, x)$ cnf(prove_this, negated_conjecture)

SYN142-1.p RPT63 synthetic problem 40 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_5(d, x)$ cnf(prove_this, negated_conjecture)

SYN143-1.p RPT63 synthetic problem 41 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_5(d, d)$ cnf(prove_this, negated_conjecture)

SYN144-1.p RPT63 synthetic problem 42 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_5(e, a)$ cnf(prove_this, negated_conjecture)

SYN145-1.p RPT63 synthetic problem 43 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_0(d, x)$ cnf(prove_this, negated_conjecture)

SYN146-1.p RPT63 synthetic problem 44 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_1(x, c, y)$ cnf(prove_this, negated_conjecture)

SYN147-1.p RPT63 synthetic problem 45 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_1(x, d, x)$ cnf(prove_this, negated_conjecture)

SYN148-1.p RPT63 synthetic problem 46 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_1(c, d, d)$ cnf(prove_this, negated_conjecture)

SYN149-1.p RPT63 synthetic problem 47 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_1(e, e, x)$ cnf(prove_this, negated_conjecture)

SYN150-1.p RPT63 synthetic problem 48 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_2(b)$ cnf(prove_this, negated_conjecture)

SYN151-1.p RPT63 synthetic problem 49 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_2(d)$ cnf(prove_this, negated_conjecture)

SYN152-1.p RPT63 synthetic problem 50 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_2(e)$ cnf(prove_this, negated_conjecture)

SYN153-1.p RPT63 synthetic problem 51 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_3(a)$ cnf(prove_this, negated_conjecture)

SYN154-1.p RPT63 synthetic problem 52 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_3(e)$ cnf(prove_this, negated_conjecture)

SYN155-1.p RPT63 synthetic problem 53 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_4(x, a)$ cnf(prove_this, negated_conjecture)

SYN156-1.p RPT63 synthetic problem 54 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')

$\neg\, n_4(a, e)$ cnf(prove_this, negated_conjecture)

SYN157-1.p RPT63 synthetic problem 55 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_5(x, d)$ cnf(prove_this, negated_conjecture)

SYN158-1.p RPT63 synthetic problem 56 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_5(a, a)$ cnf(prove_this, negated_conjecture)

SYN159-1.p RPT63 synthetic problem 57 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_5(a, e)$ cnf(prove_this, negated_conjecture)

SYN160-1.p RPT63 synthetic problem 58 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_5(b, b)$ cnf(prove_this, negated_conjecture)

SYN161-1.p RPT63 synthetic problem 59 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_5(c, x)$ cnf(prove_this, negated_conjecture)

SYN162-1.p RPT63 synthetic problem 60 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_5(c, c)$ cnf(prove_this, negated_conjecture)

SYN163-1.p RPT63 synthetic problem 61 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_5(e, a)$ cnf(prove_this, negated_conjecture)

SYN164-1.p RPT63 synthetic problem 62 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_0(b, c)$ cnf(prove_this, negated_conjecture)

SYN165-1.p RPT63 synthetic problem 63 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(x, a, x)$ cnf(prove_this, negated_conjecture)

SYN166-1.p RPT63 synthetic problem 64 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(a, b, b)$ cnf(prove_this, negated_conjecture)

SYN167-1.p RPT63 synthetic problem 65 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(d, x, d)$ cnf(prove_this, negated_conjecture)

SYN168-1.p RPT63 synthetic problem 66 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_3(x, y, b)$ cnf(prove_this, negated_conjecture)

SYN169-1.p RPT63 synthetic problem 67 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_3(x, d, y)$ cnf(prove_this, negated_conjecture)

SYN170-1.p RPT63 synthetic problem 68 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(x, c, y)$ cnf(prove_this, negated_conjecture)

SYN171-1.p RPT63 synthetic problem 69 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(d, a, a)$ cnf(prove_this, negated_conjecture)

SYN172-1.p RPT63 synthetic problem 70 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_0(c, d)$ cnf(prove_this, negated_conjecture)

SYN173-1.p RPT63 synthetic problem 71 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(e, a, e)$ cnf(prove_this, negated_conjecture)

SYN174-1.p RPT63 synthetic problem 72 (quasi-uniform distribution)

include('Axioms/SYN001-0.ax')
$\neg\, q_1(e, c, e)$ cnf(prove_this, negated_conjecture)

SYN175-1.p RPT63 synthetic problem 73 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_2(x, d, y)$ cnf(prove_this, negated_conjecture)

SYN176-1.p RPT63 synthetic problem 74 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_2(e, c, x)$ cnf(prove_this, negated_conjecture)

SYN177-1.p RPT63 synthetic problem 75 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_3(x, b)$ cnf(prove_this, negated_conjecture)

SYN178-1.p RPT63 synthetic problem 76 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_3(b, d)$ cnf(prove_this, negated_conjecture)

SYN179-1.p RPT63 synthetic problem 77 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_3(d, x)$ cnf(prove_this, negated_conjecture)

SYN180-1.p RPT63 synthetic problem 78 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_4(a, e)$ cnf(prove_this, negated_conjecture)

SYN181-1.p RPT63 synthetic problem 79 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_4(d, b)$ cnf(prove_this, negated_conjecture)

SYN182-1.p RPT63 synthetic problem 80 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_5(x, c)$ cnf(prove_this, negated_conjecture)

SYN183-1.p RPT63 synthetic problem 81 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_5(e, e)$ cnf(prove_this, negated_conjecture)

SYN184-1.p RPT63 synthetic problem 82 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_0(b)$ cnf(prove_this, negated_conjecture)

SYN185-1.p RPT63 synthetic problem 83 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_0(e)$ cnf(prove_this, negated_conjecture)

SYN186-1.p RPT63 synthetic problem 84 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_1(a)$ cnf(prove_this, negated_conjecture)

SYN187-1.p RPT63 synthetic problem 85 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_1(d)$ cnf(prove_this, negated_conjecture)

SYN188-1.p RPT63 synthetic problem 86 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_1(e)$ cnf(prove_this, negated_conjecture)

SYN189-1.p RPT63 synthetic problem 87 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_2(c)$ cnf(prove_this, negated_conjecture)

SYN190-1.p RPT63 synthetic problem 88 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_3(a, x, d)$ cnf(prove_this, negated_conjecture)

SYN191-1.p RPT63 synthetic problem 89 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_3(c, b, c)$ cnf(prove_this, negated_conjecture)

SYN192-1.p RPT63 synthetic problem 90 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_4(a)$ cnf(prove_this, negated_conjecture)

SYN193-1.p RPT63 synthetic problem 91 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_4(b)$ cnf(prove_this, negated_conjecture)

SYN194-1.p RPT63 synthetic problem 92 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_5(c, c)$ cnf(prove_this, negated_conjecture)

SYN195-1.p RPT63 synthetic problem 93 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, r_5(d, d)$ cnf(prove_this, negated_conjecture)

SYN196-1.p RPT63 synthetic problem 94 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_1(a)$ cnf(prove_this, negated_conjecture)

SYN197-1.p RPT63 synthetic problem 95 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_1(b)$ cnf(prove_this, negated_conjecture)

SYN198-1.p RPT63 synthetic problem 96 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_1(c)$ cnf(prove_this, negated_conjecture)

SYN199-1.p RPT63 synthetic problem 97 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_1(d)$ cnf(prove_this, negated_conjecture)

SYN200-1.p RPT63 synthetic problem 98 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_1(e)$ cnf(prove_this, negated_conjecture)

SYN201-1.p RPT63 synthetic problem 99 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_2(b)$ cnf(prove_this, negated_conjecture)

SYN202-1.p RPT63 synthetic problem 100 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_2(e)$ cnf(prove_this, negated_conjecture)

SYN203-1.p RPT63 synthetic problem 101 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(x, b)$ cnf(prove_this, negated_conjecture)

SYN204-1.p RPT63 synthetic problem 102 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(a, c)$ cnf(prove_this, negated_conjecture)

SYN205-1.p RPT63 synthetic problem 103 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(a, d)$ cnf(prove_this, negated_conjecture)

SYN206-1.p RPT63 synthetic problem 104 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(b, b)$ cnf(prove_this, negated_conjecture)

SYN207-1.p RPT63 synthetic problem 105 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(c, c)$ cnf(prove_this, negated_conjecture)

SYN208-1.p RPT63 synthetic problem 106 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(d, b)$ cnf(prove_this, negated_conjecture)

SYN209-1.p RPT63 synthetic problem 107 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')

$\neg\, s_4(b)$ cnf(prove_this, negated_conjecture)

SYN210-1.p RPT63 synthetic problem 108 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_4(c)$ cnf(prove_this, negated_conjecture)

SYN211-1.p RPT63 synthetic problem 109 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_4(d)$ cnf(prove_this, negated_conjecture)

SYN212-1.p RPT63 synthetic problem 110 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_4(e)$ cnf(prove_this, negated_conjecture)

SYN213-1.p RPT63 synthetic problem 111 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_5(b)$ cnf(prove_this, negated_conjecture)

SYN214-1.p RPT63 synthetic problem 112 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_5(c)$ cnf(prove_this, negated_conjecture)

SYN215-1.p RPT63 synthetic problem 113 (quasi-uniform distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_5(d)$ cnf(prove_this, negated_conjecture)

SYN216-1.p RPT63 synthetic problem 1 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_2(a, a)$ cnf(prove_this, negated_conjecture)

SYN217-1.p RPT63 synthetic problem 2 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_2(b, b)$ cnf(prove_this, negated_conjecture)

SYN218-1.p RPT63 synthetic problem 3 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_2(c, x)$ cnf(prove_this, negated_conjecture)

SYN219-1.p RPT63 synthetic problem 4 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_2(e, b)$ cnf(prove_this, negated_conjecture)

SYN220-1.p RPT63 synthetic problem 5 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(x, b)$ cnf(prove_this, negated_conjecture)

SYN221-1.p RPT63 synthetic problem 6 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(x, c)$ cnf(prove_this, negated_conjecture)

SYN222-1.p RPT63 synthetic problem 7 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(x, d)$ cnf(prove_this, negated_conjecture)

SYN223-1.p RPT63 synthetic problem 8 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(x, e)$ cnf(prove_this, negated_conjecture)

SYN224-1.p RPT63 synthetic problem 9 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(a, x)$ cnf(prove_this, negated_conjecture)

SYN225-1.p RPT63 synthetic problem 10 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(b, a)$ cnf(prove_this, negated_conjecture)

SYN226-1.p RPT63 synthetic problem 11 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(b, b)$ cnf(prove_this, negated_conjecture)

SYN227-1.p RPT63 synthetic problem 12 (skewed distribution)

include('Axioms/SYN001-0.ax')
$\neg\, l_3(b, c)$ cnf(prove_this, negated_conjecture)

SYN228-1.p RPT63 synthetic problem 13 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(b, e)$ cnf(prove_this, negated_conjecture)

SYN229-1.p RPT63 synthetic problem 14 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(c, x)$ cnf(prove_this, negated_conjecture)

SYN230-1.p RPT63 synthetic problem 15 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(c, c)$ cnf(prove_this, negated_conjecture)

SYN231-1.p RPT63 synthetic problem 16 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(d, x)$ cnf(prove_this, negated_conjecture)

SYN232-1.p RPT63 synthetic problem 17 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(d, d)$ cnf(prove_this, negated_conjecture)

SYN233-1.p RPT63 synthetic problem 18 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(e, x)$ cnf(prove_this, negated_conjecture)

SYN234-1.p RPT63 synthetic problem 19 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(e, a)$ cnf(prove_this, negated_conjecture)

SYN235-1.p RPT63 synthetic problem 20 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(e, b)$ cnf(prove_this, negated_conjecture)

SYN236-1.p RPT63 synthetic problem 21 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, l_3(e, e)$ cnf(prove_this, negated_conjecture)

SYN237-1.p RPT63 synthetic problem 22 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(x, x, e)$ cnf(prove_this, negated_conjecture)

SYN238-1.p RPT63 synthetic problem 23 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(x, b, y)$ cnf(prove_this, negated_conjecture)

SYN239-1.p RPT63 synthetic problem 24 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(x, c, x)$ cnf(prove_this, negated_conjecture)

SYN240-1.p RPT63 synthetic problem 25 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(x, e, e)$ cnf(prove_this, negated_conjecture)

SYN241-1.p RPT63 synthetic problem 26 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(a, a, x)$ cnf(prove_this, negated_conjecture)

SYN242-1.p RPT63 synthetic problem 27 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(a, a, a)$ cnf(prove_this, negated_conjecture)

SYN243-1.p RPT63 synthetic problem 28 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(a, d, d)$ cnf(prove_this, negated_conjecture)

SYN244-1.p RPT63 synthetic problem 29 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(c, x, x)$ cnf(prove_this, negated_conjecture)

SYN245-1.p RPT63 synthetic problem 30 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(c, x, c)$ cnf(prove_this, negated_conjecture)

SYN246-1.p RPT63 synthetic problem 31 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(c, b, c)$ cnf(prove_this, negated_conjecture)

SYN247-1.p RPT63 synthetic problem 32 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(d, x, y)$ cnf(prove_this, negated_conjecture)

SYN248-1.p RPT63 synthetic problem 33 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(d, c, c)$ cnf(prove_this, negated_conjecture)

SYN249-1.p RPT63 synthetic problem 34 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(d, e, e)$ cnf(prove_this, negated_conjecture)

SYN250-1.p RPT63 synthetic problem 35 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(e, a, a)$ cnf(prove_this, negated_conjecture)

SYN251-1.p RPT63 synthetic problem 36 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_1(e, b, b)$ cnf(prove_this, negated_conjecture)

SYN252-1.p RPT63 synthetic problem 37 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_4(x, d)$ cnf(prove_this, negated_conjecture)

SYN253-1.p RPT63 synthetic problem 38 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_4(e, x)$ cnf(prove_this, negated_conjecture)

SYN254-1.p RPT63 synthetic problem 39 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, m_4(e, b)$ cnf(prove_this, negated_conjecture)

SYN255-1.p RPT63 synthetic problem 40 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_2(a)$ cnf(prove_this, negated_conjecture)

SYN256-1.p RPT63 synthetic problem 41 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, n_2(c)$ cnf(prove_this, negated_conjecture)

SYN257-1.p RPT63 synthetic problem 42 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_0(c, b)$ cnf(prove_this, negated_conjecture)

SYN258-1.p RPT63 synthetic problem 43 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(x, y, d)$ cnf(prove_this, negated_conjecture)

SYN259-1.p RPT63 synthetic problem 44 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(x, d, x)$ cnf(prove_this, negated_conjecture)

SYN260-1.p RPT63 synthetic problem 45 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(x, d, d)$ cnf(prove_this, negated_conjecture)

SYN261-1.p RPT63 synthetic problem 46 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(b, x, b)$ cnf(prove_this, negated_conjecture)

SYN262-1.p RPT63 synthetic problem 47 (skewed distribution)
include('Axioms/SYN001-0.ax')

$\neg\, p_1(b, c, b)$ cnf(prove_this, negated_conjecture)

SYN263-1.p RPT63 synthetic problem 48 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(d, d, a)$ cnf(prove_this, negated_conjecture)

SYN264-1.p RPT63 synthetic problem 49 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_1(e, c, e)$ cnf(prove_this, negated_conjecture)

SYN265-1.p RPT63 synthetic problem 50 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_3(x, x, a)$ cnf(prove_this, negated_conjecture)

SYN266-1.p RPT63 synthetic problem 51 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_3(b, e, e)$ cnf(prove_this, negated_conjecture)

SYN267-1.p RPT63 synthetic problem 52 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(x, y, c)$ cnf(prove_this, negated_conjecture)

SYN268-1.p RPT63 synthetic problem 53 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(a, x, y)$ cnf(prove_this, negated_conjecture)

SYN269-1.p RPT63 synthetic problem 54 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(b, a, a)$ cnf(prove_this, negated_conjecture)

SYN270-1.p RPT63 synthetic problem 55 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(b, b, c)$ cnf(prove_this, negated_conjecture)

SYN271-1.p RPT63 synthetic problem 56 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(d, x, a)$ cnf(prove_this, negated_conjecture)

SYN272-1.p RPT63 synthetic problem 57 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(d, e, x)$ cnf(prove_this, negated_conjecture)

SYN273-1.p RPT63 synthetic problem 58 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, p_4(e, c, e)$ cnf(prove_this, negated_conjecture)

SYN274-1.p RPT63 synthetic problem 59 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_0(x, d)$ cnf(prove_this, negated_conjecture)

SYN275-1.p RPT63 synthetic problem 60 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_0(d, x)$ cnf(prove_this, negated_conjecture)

SYN276-1.p RPT63 synthetic problem 61 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_0(d, b)$ cnf(prove_this, negated_conjecture)

SYN277-1.p RPT63 synthetic problem 62 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(x, x, d)$ cnf(prove_this, negated_conjecture)

SYN278-1.p RPT63 synthetic problem 63 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(x, y, e)$ cnf(prove_this, negated_conjecture)

SYN279-1.p RPT63 synthetic problem 64 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(x, a, c)$ cnf(prove_this, negated_conjecture)

SYN280-1.p RPT63 synthetic problem 65 (skewed distribution)

include('Axioms/SYN001-0.ax')
$\neg\, q_1(x, b, y)$ cnf(prove_this, negated_conjecture)

SYN281-1.p RPT63 synthetic problem 66 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(x, c, c)$ cnf(prove_this, negated_conjecture)

SYN282-1.p RPT63 synthetic problem 67 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(x, d, y)$ cnf(prove_this, negated_conjecture)

SYN283-1.p RPT63 synthetic problem 68 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(a, b, a)$ cnf(prove_this, negated_conjecture)

SYN284-1.p RPT63 synthetic problem 69 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(a, c, a)$ cnf(prove_this, negated_conjecture)

SYN285-1.p RPT63 synthetic problem 70 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(a, d, d)$ cnf(prove_this, negated_conjecture)

SYN286-1.p RPT63 synthetic problem 71 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(a, e, x)$ cnf(prove_this, negated_conjecture)

SYN287-1.p RPT63 synthetic problem 72 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(b, x, y)$ cnf(prove_this, negated_conjecture)

SYN288-1.p RPT63 synthetic problem 73 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(b, b, b)$ cnf(prove_this, negated_conjecture)

SYN289-1.p RPT63 synthetic problem 74 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(b, d, b)$ cnf(prove_this, negated_conjecture)

SYN290-1.p RPT63 synthetic problem 75 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(c, x, y)$ cnf(prove_this, negated_conjecture)

SYN291-1.p RPT63 synthetic problem 76 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(d, x, y)$ cnf(prove_this, negated_conjecture)

SYN292-1.p RPT63 synthetic problem 77 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(d, b, b)$ cnf(prove_this, negated_conjecture)

SYN293-1.p RPT63 synthetic problem 78 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(d, d, a)$ cnf(prove_this, negated_conjecture)

SYN294-1.p RPT63 synthetic problem 79 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(d, d, c)$ cnf(prove_this, negated_conjecture)

SYN295-1.p RPT63 synthetic problem 80 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(d, d, d)$ cnf(prove_this, negated_conjecture)

SYN296-1.p RPT63 synthetic problem 81 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(e, b, e)$ cnf(prove_this, negated_conjecture)

SYN297-1.p RPT63 synthetic problem 82 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, q_1(e, e, e)$ cnf(prove_this, negated_conjecture)

SYN298-1.p RPT63 synthetic problem 83 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(b, x)$ cnf(prove_this, negated_conjecture)

SYN299-1.p RPT63 synthetic problem 84 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(b, a)$ cnf(prove_this, negated_conjecture)

SYN300-1.p RPT63 synthetic problem 85 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_3(b, d)$ cnf(prove_this, negated_conjecture)

SYN301-1.p RPT63 synthetic problem 86 (skewed distribution)
include('Axioms/SYN001-0.ax')
$\neg\, s_4(a)$ cnf(prove_this, negated_conjecture)

SYN303-1.p Problem for testing satisfiability
$p(x, x)$ cnf(clause$_1$, negated_conjecture)
$p(x, y) \;\Rightarrow\; p(y, x)$ cnf(clause$_2$, negated_conjecture)
$p(f(x), f(y)) \;\Rightarrow\; p(x, y)$ cnf(clause$_3$, negated_conjecture)
$p(x, y) \;\Rightarrow\; p(f(x), f(y))$ cnf(clause$_4$, negated_conjecture)
$\neg\, p(a, f(x))$ cnf(clause$_5$, negated_conjecture)

SYN304-1.p Problem for testing satisfiability
$p(x, f(x)) \;\Rightarrow\; r(f(x), g(x), x)$ cnf(clause$_1$, negated_conjecture)
$p(a, x)$ cnf(clause$_2$, negated_conjecture)
$r(f(a), g(a), a)$ cnf(clause$_3$, negated_conjecture)
$s(f(x), x, x)$ or $l(x)$ cnf(clause$_4$, negated_conjecture)
$\neg\, s(f(x), x, a)$ cnf(clause$_5$, negated_conjecture)
$\neg\, s(f(x), x, b)$ cnf(clause$_6$, negated_conjecture)
$l(a)$ cnf(clause$_7$, negated_conjecture)
$l(b)$ cnf(clause$_8$, negated_conjecture)

SYN305-1.p Problem for testing satisfiability
$f(g_1(x)) = x$ cnf(clause$_1$, negated_conjecture)
$f(g_2(x)) = x$ cnf(clause$_2$, negated_conjecture)
$g_1(x) \neq g_2(x)$ cnf(clause$_3$, negated_conjecture)

SYN306-1.p Problem for testing satisfiability
$p(x)$ or $q(g(x, x))$ cnf(clause$_1$, negated_conjecture)
$q(y) \;\Rightarrow\; r(x, y)$ cnf(clause$_2$, negated_conjecture)
$r(a, a) \;\Rightarrow\; \neg\, r(f(b), a)$ cnf(clause$_3$, negated_conjecture)
$r(f(x), y)$ cnf(clause$_4$, negated_conjecture)
$p(f(x)) \;\Rightarrow\; p(x)$ cnf(clause$_5$, negated_conjecture)
$\neg\, p(a)$ cnf(clause$_6$, negated_conjecture)

SYN307-1.p Problem for testing satisfiability
$(p(x, y, u)$ and $p(y, z, u)) \;\Rightarrow\; p(x, z, u)$ cnf(clause$_1$, negated_conjecture)
$p(x, x, a)$ cnf(clause$_2$, negated_conjecture)
$p(x, z, u) \;\Rightarrow\; (p(x, y, u)$ or $p(y, z, u))$ cnf(clause$_3$, negated_conjecture)
$\neg\, p(x, x, b)$ cnf(clause$_4$, negated_conjecture)

SYN308-1.p Problem for testing satisfiability
$p(f(f(a)), \mathrm{gf}(c, \mathrm{gf}(y, x)))$ or $p(u, f(u))$ cnf(clause$_1$, negated_conjecture)
$(p(f(h(x, y, z)), z)$ and $g(u)) \;\Rightarrow\; (g(b)$ or $g(v))$ cnf(clause$_2$, negated_conjecture)
$e(\mathrm{gf}(h(z, x, y), f(b)))$ cnf(clause$_3$, negated_conjecture)
$r(\mathrm{gf}(v, \mathrm{gf}(v, u)), \mathrm{gf}(u, v))$ or $r(f(b), \mathrm{gf}(f(f(a)), \mathrm{gf}(u, v)))$ cnf(clause$_4$, negated_conjecture)

SYN309-1.p Problem for testing satisfiability
$s(h(x, y, z), a, h(x, y, z)) \;\Rightarrow\; p(f(x), a, g(x))$ cnf(clause$_1$, negated_conjecture)
$r(f(a), a, b)$ or $s(h(a, y, z), b, h(a, y, z))$ cnf(clause$_2$, negated_conjecture)
$p(k(x, y), k(x, y), b) \;\Rightarrow\; (s(f(x), x, x)$ or $p(f(x), g(x), g(x)))$ cnf(clause$_3$, negated_conjecture)
$s(f(x), x, x)$ or $p(f(y), y, f(y))$ cnf(clause$_4$, negated_conjecture)
$p(x, x, x)$ cnf(clause$_5$, negated_conjecture)
$p(a, b, c)$ cnf(clause$_6$, negated_conjecture)

SYN310-1.p Problem for testing satisfiability
$p(x_2, x_1, x) \Rightarrow p(x, x_1, x_2)$ cnf(clause$_1$, negated_conjecture)
$p(x_1, x, x_2) \Rightarrow p(x, x_1, x_2)$ cnf(clause$_2$, negated_conjecture)
$p(x, x_1, g(x_2)) \Rightarrow p(x, x_1, x_2)$ cnf(clause$_3$, negated_conjecture)
$p(f(x), x_1, x_2) \Rightarrow p(x, x_1, x_2)$ cnf(clause$_4$, negated_conjecture)
$\neg\, p(a, b, c)$ cnf(clause$_5$, negated_conjecture)
$p(f(g(a)), f(g(b)), f(g(c)))$ cnf(clause$_6$, negated_conjecture)

SYN311-1.p Problem for testing satisfiability
$p(x, x_1, x_2, x_3) \Rightarrow p(x_3, x, x_1, x_2)$ cnf(clause$_1$, negated_conjecture)
$p(x, x_1, x_2, x_3) \Rightarrow p(x_3, x_2, x_1, x)$ cnf(clause$_2$, negated_conjecture)
$p(x, x_1, x_2, x_3) \Rightarrow p(x, x_1, x_2, g(x_3))$ cnf(clause$_3$, negated_conjecture)
$p(x, x_1, x_2, x_3) \Rightarrow p(f(x), x_1, x_2, x_3)$ cnf(clause$_4$, negated_conjecture)
$p(a, b, c, d)$ cnf(clause$_5$, negated_conjecture)
$\neg\, p(f(g(d)), f(g(c)), f(g(b)), f(g(a)))$ cnf(clause$_6$, negated_conjecture)

SYN312-1.p Problem for testing satisfiability
$(p(x, x_1, x_2)$ and $p(x_1, x_3, x_2)) \Rightarrow p(x, x_3, x_2)$ cnf(clause$_1$, negated_conjecture)
$p(x, x_1, x_2) \Rightarrow p(x_2, x_1, x)$ cnf(clause$_2$, negated_conjecture)
$p(x, x_1, x_2) \Rightarrow p(x_1, x, x_2)$ cnf(clause$_3$, negated_conjecture)
$p(x, x_1, x_2) \Rightarrow p(x, x_1, f(x_2))$ cnf(clause$_4$, negated_conjecture)
$p(x, x_1, x_2) \Rightarrow p(g(x), x_1, x_2)$ cnf(clause$_5$, negated_conjecture)
$p(a, f(b), c)$ cnf(clause$_6$, negated_conjecture)
$p(f(b), d, c)$ cnf(clause$_7$, negated_conjecture)
$\neg\, p(f(g(a)), f(g(d)), f(g(c)))$ cnf(clause$_8$, negated_conjecture)

SYN313-1.001.002.p Problem for testing satisfiability
$p(x_0, f_0(x_0), x_1) \Rightarrow \neg\, p(x_0, f_1(x_1), x_2)$ cnf(clause$_1$, negated_conjecture)
$p(h_0, y_0, j_0(y_2))$ or $p(h_1(y_0), y_1, j_1(y_2))$ or $p(h_2(y_1), y_2, j_2(y_2))$ cnf(clause$_2$, negated_conjecture)

SYN314-1.002.001.p Problem for testing satisfiability
$p(x_0, f_0(x_0), x_1, g_0(x_3))$ or $p(x_0, f_1(x_1), x_2, g_1(x_3))$ or $p(x_0, f_2(x_2), x_3, g_2(x_3))$ cnf(clause$_1$, negated_conjecture)
$p(h_0, y_0, j_0(y_1), y_2) \Rightarrow \neg\, p(h_1(y_0), y_1, j_1(y_2), y_3)$ cnf(clause$_2$, negated_conjecture)

SYN315+1.p Church problem 46.2 (1)
$\exists x$: $\forall y$: $((\text{big\_f}(x) \iff p) \Rightarrow (\text{big\_f}(y) \iff p))$ fof(church_46_2$_1$, conjecture)

SYN315-1.p Church problem 46.2 (1)
$f(x) \Rightarrow p(a)$ cnf(clause$_1$, negated_conjecture)
$p(a) \Rightarrow f(x)$ cnf(clause$_2$, negated_conjecture)
$f(y(x)) \Rightarrow \neg\, p(a)$ cnf(clause$_3$, negated_conjecture)
$p(a)$ or $f(y(x))$ cnf(clause$_4$, negated_conjecture)

SYN316+1.p Church problem 46.2 (2)
$\exists x$: $\forall y$: $(\text{big\_f}(x) \iff \text{big\_f}(y))$ fof(church_46_2$_2$, conjecture)

SYN316-1.p Church problem 46.2 (2)
$f(x) \Rightarrow \neg\, f(y(x))$ cnf(clause$_1$, negated_conjecture)
$f(x)$ or $f(y(x))$ cnf(clause$_2$, negated_conjecture)

SYN317+1.p Church problem 46.2 (3)
$\exists x$: $(\text{big\_f}(x) \Rightarrow \text{big\_g}(x)) \iff \exists x, y$: $(\text{big\_f}(x) \Rightarrow \text{big\_g}(y))$ fof(church_46_2$_3$, conjecture)

SYN317-1.p Church problem 46.2 (3)
$f(z)$ cnf(clause$_1$, negated_conjecture)
$\neg\, g(z)$ cnf(clause$_2$, negated_conjecture)
$f(c) \Rightarrow (g(c)$ or $f(a)$ or $g(b))$ cnf(clause$_3$, negated_conjecture)

SYN318+1.p Church problem 46.2 (4)
$\exists y$: $(\forall x$: $(\text{big\_f}(x) \Rightarrow (\text{big\_f}(y) \Rightarrow \text{big\_g}(x))) \Rightarrow (p \Rightarrow \forall x$: $(\text{big\_f}(x) \Rightarrow \text{big\_g}(y))))$ fof(church_46_2$_4$, conjecture)

SYN318-1.p Church problem 46.2 (4)
$(f(x)$ and $f(b)) \Rightarrow g(x)$ cnf(clause$_1$, negated_conjecture)
$p(a)$ cnf(clause$_2$, negated_conjecture)
$f(x)$ cnf(clause$_3$, negated_conjecture)
$\neg\, g(b)$ cnf(clause$_4$, negated_conjecture)

SYN319+1.p Church problem 46.2 (5)
$\exists x, y\colon \forall z_1, z_2\colon (((\text{big\_f}(y) \Rightarrow \text{big\_g}(z_1)) \Rightarrow (\text{big\_g}(x) \text{ and } \neg\, \text{big\_f}(z_1))) \Rightarrow (((\text{big\_f}(x) \text{ or } \text{big\_g}(x)) \Rightarrow \text{big\_h}(x)) \Rightarrow (\text{big\_h}(z_2) \text{ and } (\text{big\_h}(y) \Rightarrow ((\text{big\_f}(z_2) \text{ or } \text{big\_g}(z_2)) \Rightarrow \text{big\_h}(z_2))))))$ fof(church_46_2$_5$, conjecture)

SYN319-1.p Church problem 46.2 (5)
$f(y) \text{ or } g(x)$ cnf(clause$_1$, negated_conjecture)
$f(z_1(x, y)) \Rightarrow f(y)$ cnf(clause$_2$, negated_conjecture)
$g(z_1(x, y)) \Rightarrow g(x)$ cnf(clause$_3$, negated_conjecture)
$g(z_1(x, y)) \Rightarrow \neg\, f(z_1(x, y))$ cnf(clause$_4$, negated_conjecture)
$f(x) \Rightarrow h(x)$ cnf(clause$_5$, negated_conjecture)
$g(x) \Rightarrow h(x)$ cnf(clause$_6$, negated_conjecture)
$\neg\, h(z_2(x, y))$ cnf(clause$_7$, negated_conjecture)

SYN320+1.p Church problem 46.3 (1)
$\exists z, x\colon \forall y_1, y_2\colon ((\neg\, \text{big\_f}(x, z) \Rightarrow \text{big\_f}(z, y_1)) \Rightarrow (\text{big\_f}(y_2, z) \Rightarrow \text{big\_f}(z, y_2)))$ fof(church_46_3$_1$, conjecture)

SYN320-1.p Church problem 46.3 (1)
$f(x, a) \text{ or } f(a, y_1(x))$ cnf(clause$_1$, negated_conjecture)
$f(y_2(x), a)$ cnf(clause$_2$, negated_conjecture)
$\neg\, f(a, y_2(x))$ cnf(clause$_3$, negated_conjecture)

SYN321+1.p Church problem 46.3 (2)
$\exists x, y\colon ((\exists z\colon \text{big\_f}(x, z) \Rightarrow \forall z\colon \text{big\_g}(x, z)) \Rightarrow (\forall z\colon (\text{big\_g}(z, z) \Rightarrow \text{big\_f}(z, y)) \Rightarrow (\text{big\_f}(x, y) \Leftrightarrow \forall z\colon \text{big\_g}(x, z))))$ fof(c

SYN321-1.p Church problem 46.3 (2)
$f(a, z) \Rightarrow g(a, u)$ cnf(clause$_1$, negated_conjecture)
$g(u, u) \Rightarrow f(u, b)$ cnf(clause$_2$, negated_conjecture)
$f(a, b) \text{ or } g(a, u)$ cnf(clause$_3$, negated_conjecture)
$f(a, b) \Rightarrow \neg\, g(a, d)$ cnf(clause$_4$, negated_conjecture)

SYN322+1.p Church problem 46.4 (1)
$\exists y\colon (\forall x\colon (\text{big\_f}(x, y) \Rightarrow \text{big\_f}(y, x)) \Rightarrow \neg\, \forall x\colon (\text{big\_f}(x, y) \Rightarrow \neg\, \text{big\_f}(y, x)))$ fof(church_46_4$_1$, conjecture)

SYN322-1.p Church problem 46.4 (1)
$f(x, a) \Rightarrow f(a, x)$ cnf(clause$_1$, negated_conjecture)
$f(x, a) \Rightarrow \neg\, f(a, x)$ cnf(clause$_2$, negated_conjecture)

SYN323+1.p Church problem 46.4 (2)
$\exists y\colon (\forall x\colon ((\text{big\_f}(x, y) \Rightarrow \text{big\_f}(y, x)) \Rightarrow \text{big\_g}(x, y)) \Rightarrow \neg\, \forall x\colon ((\text{big\_f}(x, y) \Rightarrow \text{big\_f}(y, x)) \Rightarrow \neg\, \text{big\_g}(x, y)))$ fof(church_4

SYN323-1.p Church problem 46.4 (2)
$f(x, a) \text{ or } g(x, a)$ cnf(clause$_1$, negated_conjecture)
$f(a, x) \Rightarrow g(x, a)$ cnf(clause$_2$, negated_conjecture)
$g(x, a) \Rightarrow f(x, a)$ cnf(clause$_3$, negated_conjecture)
$f(a, x) \Rightarrow \neg\, g(x, a)$ cnf(clause$_4$, negated_conjecture)

SYN324+1.p Church problem 46.9 (1)
$\exists x\colon \forall y\colon ((\text{big\_f}(x, y) \Leftrightarrow \text{big\_f}(x, x)) \Rightarrow (\text{big\_f}(x, y) \Leftrightarrow \text{big\_f}(y, y)))$ fof(church_46_9$_1$, conjecture)

SYN324-1.p Church problem 46.9 (1)
$f(x, x) \Rightarrow f(x, y(x))$ cnf(clause$_1$, negated_conjecture)
$f(x, y(x)) \Rightarrow f(x, x)$ cnf(clause$_2$, negated_conjecture)
$f(x, y(x)) \text{ or } f(y(x), y(x))$ cnf(clause$_3$, negated_conjecture)
$f(x, y(x)) \Rightarrow \neg\, f(y(x), y(x))$ cnf(clause$_4$, negated_conjecture)

SYN325+1.p Church problem 46.9 (2)
$\exists x\colon \forall y\colon (((\text{big\_f}(x, x) \Rightarrow \text{big\_f}(y, y)) \Rightarrow (\text{big\_f}(x, y) \text{ and } \text{big\_g}(x))) \Rightarrow \text{big\_g}(y))$ fof(church_46_9$_2$, conjecture)

SYN325-1.p Church problem 46.9 (2)
$f(x, x) \text{ or } f(x, y(x))$ cnf(clause$_1$, negated_conjecture)
$f(x, x) \text{ or } g(x)$ cnf(clause$_2$, negated_conjecture)
$f(y(x), y(x)) \Rightarrow f(x, y(x))$ cnf(clause$_3$, negated_conjecture)
$f(y(x), y(x)) \Rightarrow g(x)$ cnf(clause$_4$, negated_conjecture)
$\neg\, g(y(x))$ cnf(clause$_5$, negated_conjecture)

SYN326+1.p Church problem 46.12 (1)
$\exists x\colon \forall y, z\colon (((\text{big\_f}(y, z) \Rightarrow (\text{big\_g}(y) \Rightarrow \text{big\_h}(x))) \Rightarrow \text{big\_f}(x, x)) \Rightarrow (((\text{big\_f}(z, x) \Rightarrow \text{big\_g}(x)) \Rightarrow \text{big\_h}(z)) \Rightarrow (\text{big\_f}(x, y) \Rightarrow \text{big\_f}(z, z))))$ fof(church_46_12$_1$, conjecture)

SYN326-1.p Church problem 46.12 (1)
$f(y(x), z(x))$ or $f(x, x)$ cnf(clause$_1$, negated_conjecture)
$g(y(x))$ or $f(x, x)$ cnf(clause$_2$, negated_conjecture)
$h(x) \Rightarrow f(x, x)$ cnf(clause$_3$, negated_conjecture)
$f(z(x), x)$ or $h(z(x))$ cnf(clause$_4$, negated_conjecture)
$g(x) \Rightarrow h(z(x))$ cnf(clause$_5$, negated_conjecture)
$f(x, y(x))$ cnf(clause$_6$, negated_conjecture)
$\neg f(z(x), z(x))$ cnf(clause$_7$, negated_conjecture)

SYN327+1.p Church problem 46.12 (2)
$\forall x$: $\exists y$: $\forall z$: (big_f$(y, x) \Rightarrow$ ((big_f$(x, z) \Rightarrow$ big_f$(x, y))$ and (big_f$(x, y) \Rightarrow$ ($\neg$ big_f$(x, z) \Rightarrow$ (big_f(y, x) and big_f$(z, y))))))$

SYN327-1.p Church problem 46.12 (2)
$f(y, a)$ or $f(a, y)$ cnf(clause$_1$, negated_conjecture)
$f(a, z(y)) \Rightarrow f(y, a)$ cnf(clause$_2$, negated_conjecture)
$f(a, z(y))$ or $f(a, y)$ cnf(clause$_3$, negated_conjecture)
($f(y, a)$ and $f(z(y), y)) \Rightarrow f(a, z(y))$ cnf(clause$_4$, negated_conjecture)
$f(a, y) \Rightarrow \neg f(a, z(y))$ cnf(clause$_5$, negated_conjecture)
($f(a, y)$ and $f(y, a)) \Rightarrow \neg f(z(y), y)$ cnf(clause$_6$, negated_conjecture)

SYN328+1.p Church problem 46.12 (3)
$\exists x$: $\forall y, z$: (((big_f$(y) \Rightarrow$ big_g$(y)) \iff$ big_f$(x)) \Rightarrow$ (((big_f$(y) \Rightarrow$ big_h$(y)) \iff$ big_g$(x)) \Rightarrow$ ((((big_f$(y) \Rightarrow$ big_g$(y)) \Rightarrow$ big_h$(y)) \iff$ big_h$(x)) \Rightarrow$ (big_f(z) and big_g(z) and big_h$(z)))))$ fof(church_46_12$_3$, conjecture)

SYN328-1.p Church problem 46.12 (3)
($f(y(x))$ and $f(x)) \Rightarrow g(y(x))$ cnf(clause$_1$, negated_conjecture)
$f(y(x))$ or $f(x)$ cnf(clause$_2$, negated_conjecture)
$g(y(x)) \Rightarrow f(x)$ cnf(clause$_3$, negated_conjecture)
($f(y(x))$ and $g(x)) \Rightarrow h(y(x))$ cnf(clause$_4$, negated_conjecture)
$f(y(x))$ or $g(x)$ cnf(clause$_5$, negated_conjecture)
$h(y(x)) \Rightarrow g(x)$ cnf(clause$_6$, negated_conjecture)
$h(x) \Rightarrow (f(y(x))$ or $h(y(x)))$ cnf(clause$_7$, negated_conjecture)
($g(y(x))$ and $h(x)) \Rightarrow h(y(x))$ cnf(clause$_8$, negated_conjecture)
$f(y(x)) \Rightarrow (g(y(x))$ or $h(x))$ cnf(clause$_9$, negated_conjecture)
$h(y(x)) \Rightarrow h(x)$ cnf(clause$_{10}$, negated_conjecture)
($f(z(x))$ and $g(z(x))) \Rightarrow \neg h(z(x))$ cnf(clause$_{11}$, negated_conjecture)

SYN329+1.p Church problem 46.14 (1)
$\exists x, y$: $\forall z$: (big_f$(x, x) \Rightarrow$ (big_f$(y, y) \Rightarrow$ (big_f$(x, z) \Rightarrow$ big_f$(z, y))))$ fof(church_46_14$_1$, conjecture)

SYN329-1.p Church problem 46.14 (1)
$f(x, x)$ cnf(clause$_1$, negated_conjecture)
$f(y, y)$ cnf(clause$_2$, negated_conjecture)
$f(x, z(x, y))$ cnf(clause$_3$, negated_conjecture)
$\neg f(z(x, y), y)$ cnf(clause$_4$, negated_conjecture)

SYN330+1.p Church problem 46.14 (2)
$\exists x, y$: $\forall z$: ((big_f$(x, z) \iff$ big_f$(z, y)) \Rightarrow$ ((big_f$(z, y) \iff$ big_f$(z, z)) \Rightarrow$ ((big_f$(x, y) \iff$ big_f$(y, x)) \Rightarrow$ (big_f$(x, y) \iff$ big_f$(x, z)))))$ fof(church_46_14$_2$, conjecture)

SYN330-1.p Church problem 46.14 (2)
$f(z(x, y), y) \Rightarrow f(x, z(x, y))$ cnf(clause$_1$, negated_conjecture)
$f(x, z(x, y)) \Rightarrow f(z(x, y), y)$ cnf(clause$_2$, negated_conjecture)
$f(z(x, y), z(x, y)) \Rightarrow f(z(x, y), y)$ cnf(clause$_3$, negated_conjecture)
$f(z(x, y), y) \Rightarrow f(z(x, y), z(x, y))$ cnf(clause$_4$, negated_conjecture)
$f(y, x) \Rightarrow f(x, y)$ cnf(clause$_5$, negated_conjecture)
$f(y, x) \Rightarrow f(x, y)$ cnf(clause$_6$, negated_conjecture)
$f(x, y)$ or $f(x, z(x, y))$ cnf(clause$_7$, negated_conjecture)
$f(x, y) \Rightarrow \neg f(x, z(x, y))$ cnf(clause$_8$, negated_conjecture)

SYN331+1.p Church problem 46.14 (3)
$\exists x, y$: $\forall z$: (big_f$(x, z) \Rightarrow$ (big_f$(y, z) \Rightarrow$ ((big_f$(x, y) \iff$ big_f$(z, z)) \Rightarrow$ ((big_f(y, x) or big_f$(z, z)) \Rightarrow$ (big_f(z, x) or big_f$(z, y))))))$ fof(church_46_14$_3$, conjecture)

SYN331-1.p Church problem 46.14 (3)

$f(x, z(x, y))$ cnf(clause$_1$, negated_conjecture)
$f(y, z(x, y))$ cnf(clause$_2$, negated_conjecture)
$f(z(x, y), z(x, y)) \Rightarrow f(x, y)$ cnf(clause$_3$, negated_conjecture)
$f(x, y) \Rightarrow f(z(x, y), z(x, y))$ cnf(clause$_4$, negated_conjecture)
$f(y, x)$ or $f(z(x, y), z(x, y))$ cnf(clause$_5$, negated_conjecture)
$\neg f(z(x, y), x)$ cnf(clause$_6$, negated_conjecture)
$\neg f(z(x, y), y)$ cnf(clause$_7$, negated_conjecture)

SYN332+1.p Church problem 46.14 (4)
$\exists x, y$: $\forall z$: ((big_f(x, y) and big_f(y, x)) $<>$ big_f$(x, z) \Rightarrow$ ((big_f$(x, z) \iff$ big_f$(z, x)) \Rightarrow$ ((big_f$(x, z) \iff$ big_f$(y, z)) \Rightarrow$ (((big_f$(y, x) \Rightarrow$ big_f$(x, y)) \iff$ big_f$(z, z)) \Rightarrow$ ((big_f$(x, y) \iff$ big_f$(y, x)) \iff$ big_f$(z, y))))))$ fof(church_46_14$_4$, conjecture)

SYN332-1.p Church problem 46.14 (4)
$f(x, y)$ or $f(x, z(x, y))$ cnf(clause$_1$, negated_conjecture)
$f(y, x)$ or $f(x, z(x, y))$ cnf(clause$_2$, negated_conjecture)
($f(x, y)$ and $f(y, x)) \Rightarrow \neg f(x, z(x, y))$ cnf(clause$_3$, negated_conjecture)
$f(z(x, y), x) \Rightarrow f(x, z(x, y))$ cnf(clause$_4$, negated_conjecture)
$f(x, z(x, y)) \Rightarrow f(z(x, y), x)$ cnf(clause$_5$, negated_conjecture)
$f(y, z(x, y)) \Rightarrow f(x, z(x, y))$ cnf(clause$_6$, negated_conjecture)
$f(x, z(x, y)) \Rightarrow f(y, z(x, y))$ cnf(clause$_7$, negated_conjecture)
($f(y, x)$ and $f(z(x, y), z(x, y))) \Rightarrow f(x, y)$ cnf(clause$_8$, negated_conjecture)
$f(y, x)$ or $f(z(x, y), z(x, y))$ cnf(clause$_9$, negated_conjecture)
$f(x, y) \Rightarrow f(z(x, y), z(x, y))$ cnf(clause$_{10}$, negated_conjecture)
$f(y, x) \Rightarrow (f(x, y)$ or $f(z(x, y), y))$ cnf(clause$_{11}$, negated_conjecture)
$f(x, y) \Rightarrow (f(y, x)$ or $f(z(x, y), y))$ cnf(clause$_{12}$, negated_conjecture)
$f(z(x, y), y) \Rightarrow (f(x, y)$ or $f(y, x))$ cnf(clause$_{13}$, negated_conjecture)
($f(x, y)$ and $f(y, x)) \Rightarrow \neg f(z(x, y), y)$ cnf(clause$_{14}$, negated_conjecture)

SYN333+1.p Church problem 46.14 (5)
$\exists x, y$: $\forall z$: (big_f$(x, y) \Rightarrow$ (big_f(y, z) and big_f(z, z) and ((big_f(x, y) and big_g$(x, y)) \Rightarrow$ (big_g(x, z) and big_g$(z, z)))))$ f

SYN333-1.p Church problem 46.14 (5)
$f(x, y)$ cnf(clause$_1$, negated_conjecture)
($f(y, z(x, y))$ and $f(z(x, y), z(x, y))) \Rightarrow g(x, y)$ cnf(clause$_2$, negated_conjecture)
($f(y, z(x, y))$ and $f(z(x, y), z(x, y))$ and $g(x, z(x, y))) \Rightarrow \neg g(z(x, y), z(x, y))$ cnf(clause$_3$, negated_conjecture)

SYN334+1.p Church problem 46.14 (6)
$\exists x, y$: $\forall z$: ((big_f$(x, y) \Rightarrow$ (big_f$(x, z) \iff$ big_g$(y, z))) \Rightarrow$ ((big_f$(x, y) \iff$ (big_f$(z, z) \Rightarrow$ big_g$(z, z))) \Rightarrow$ (big_g$(x, y) \iff$ big_g$(z, z))))$ fof(church_46_14$_6$, conjecture)

SYN334-1.p Church problem 46.14 (6)
($f(x, y)$ and $g(y, z(x, y))) \Rightarrow f(x, z(x, y))$ cnf(clause$_1$, negated_conjecture)
($f(x, y)$ and $f(x, z(x, y))) \Rightarrow g(y, z(x, y))$ cnf(clause$_2$, negated_conjecture)
($f(z(x, y), z(x, y))$ and $f(x, y)) \Rightarrow g(z(x, y), z(x, y))$ cnf(clause$_3$, negated_conjecture)
$f(z(x, y), z(x, y))$ or $f(x, y)$ cnf(clause$_4$, negated_conjecture)
$g(z(x, y), z(x, y)) \Rightarrow f(x, y)$ cnf(clause$_5$, negated_conjecture)
$g(x, y)$ or $g(z(x, y), z(x, y))$ cnf(clause$_6$, negated_conjecture)
$g(x, y) \Rightarrow \neg g(z(x, y), z(x, y))$ cnf(clause$_7$, negated_conjecture)

SYN335+1.p Church problem 46.14 (7)
$\exists x, y$: $\forall z$: (big_f$(x, z) \Rightarrow$ (((big_f$(z, z) \Rightarrow$ big_g$(z, z)) \iff$ big_f$(x, y)) \Rightarrow$ (((big_g$(z, z) \Rightarrow$ big_f$(z, z)) \iff$ big_g$(x, y)) \Rightarrow$ (((big_g$(x, y) \Rightarrow$ big_f$(y, x)) \iff$ big_g$(y, z)) \Rightarrow$ (big_f$(z, y) \iff$ big_f$(y, x))))))$ fof(church_46_14$_7$, con

SYN335-1.p Church problem 46.14 (7)
$f(x, z(x, y))$ cnf(clause$_1$, negated_conjecture)
($f(z(x, y), z(x, y))$ and $f(x, y)) \Rightarrow g(z(x, y), z(x, y))$ cnf(clause$_2$, negated_conjecture)
$f(z(x, y), z(x, y))$ or $f(x, y)$ cnf(clause$_3$, negated_conjecture)
$g(z(x, y), z(x, y)) \Rightarrow f(x, y)$ cnf(clause$_4$, negated_conjecture)
($g(z(x, y), z(x, y))$ and $g(x, y)) \Rightarrow f(z(x, y), z(x, y))$ cnf(clause$_5$, negated_conjecture)
$g(z(x, y), z(x, y))$ or $g(x, y)$ cnf(clause$_6$, negated_conjecture)
$f(z(x, y), z(x, y)) \Rightarrow g(x, y)$ cnf(clause$_7$, negated_conjecture)
($g(x, y)$ and $g(y, z(x, y))) \Rightarrow f(y, x)$ cnf(clause$_8$, negated_conjecture)
$g(x, y)$ or $g(y, z(x, y))$ cnf(clause$_9$, negated_conjecture)

$f(y,x) \Rightarrow g(y,z(x,y))$ cnf(clause$_{10}$, negated_conjecture)
$f(z(x,y),y)$ or $f(y,x)$ cnf(clause$_{11}$, negated_conjecture)
$f(z(x,y),y) \Rightarrow \neg f(y,x)$ cnf(clause$_{12}$, negated_conjecture)

SYN336+1.p Church problem 46.15 (1)
$\forall x\colon \exists y_1, y_2\colon \forall z\colon (\text{big\_f}(x,z) \Rightarrow (\text{big\_f}(y_1,z) \Rightarrow (\text{big\_f}(y_2,z) \Rightarrow (\text{big\_f}(y_1,x) \Rightarrow \text{big\_f}(z,y_2)))))$ fof(church_46_15$_1$, conjectu

SYN336-1.p Church problem 46.15 (1)
$f(a,z(y_1,y_2))$ cnf(clause$_1$, negated_conjecture)
$f(y_1,z(y_1,y_2))$ cnf(clause$_2$, negated_conjecture)
$f(y_2,z(y_1,y_2))$ cnf(clause$_3$, negated_conjecture)
$f(y_1,a)$ cnf(clause$_4$, negated_conjecture)
$\neg f(z(y_1,y_2),y_2)$ cnf(clause$_5$, negated_conjecture)

SYN337+1.p Church problem 46.15 (2)
$\forall x_1, x_2\colon \exists y\colon \forall z\colon (\text{big\_f}(x_1,y) \Rightarrow (\text{big\_f}(z,x_1) \Rightarrow (\text{big\_f}(z,y) \Rightarrow (\text{big\_f}(x_2,y) \text{ or } \text{big\_f}(x_2,z)))))$ fof(church_46_15$_2$, conjectu

SYN337-1.p Church problem 46.15 (2)
$f(a,y)$ cnf(clause$_1$, negated_conjecture)
$f(z(y),a)$ cnf(clause$_2$, negated_conjecture)
$f(z(y),y)$ cnf(clause$_3$, negated_conjecture)
$\neg f(b,y)$ cnf(clause$_4$, negated_conjecture)
$\neg f(b,z(y))$ cnf(clause$_5$, negated_conjecture)

SYN338+1.p Church problem 46.15 (3)
$\exists x\colon \forall y\colon \exists z\colon (\text{big\_f}(x,y) \Rightarrow (\text{big\_f}(z,x) \Rightarrow \text{big\_f}(y,y)))$ fof(church_46_15$_3$, conjecture)

SYN338-1.p Church problem 46.15 (3)
$f(x,y(x))$ cnf(clause$_1$, negated_conjecture)
$f(z,x)$ cnf(clause$_2$, negated_conjecture)
$\neg f(y(x),y(x))$ cnf(clause$_3$, negated_conjecture)

SYN339+1.p Church problem 46.15 (4)
$\exists x\colon \forall y\colon \exists z\colon (\text{big\_f}(x,y,z) \Rightarrow \text{big\_f}(y,z,z))$ fof(church_46_15$_4$, conjecture)

SYN339-1.p Church problem 46.15 (4)
$f(x,y(x),z)$ cnf(clause$_1$, negated_conjecture)
$\neg f(y(x),z,z)$ cnf(clause$_2$, negated_conjecture)

SYN340+1.p Church problem 46.15 (5)
$\exists x\colon \forall y\colon \exists z_1, z_2\colon (\text{big\_f}(x,y,z_1,z_2,z_1) \Rightarrow \text{big\_f}(z_1,x,y,z_1,z_2))$ fof(church_46_15$_5$, conjecture)

SYN340-1.p Church problem 46.15 (5)
$f(x,y(x),z_1,z_2,z_1)$ cnf(clause$_1$, negated_conjecture)
$\neg f(z_1,x,y(x),z_1,z_2)$ cnf(clause$_2$, negated_conjecture)

SYN341+1.p Church problem 46.15 (6)
$\exists x_1\colon \forall x_2\colon \exists x_3\colon \forall x_4\colon (\text{big\_f}(x_1,x_2,x_3) \Rightarrow \text{big\_f}(x_2,x_3,x_4))$ fof(church_46_15$_6$, conjecture)

SYN341-1.p Church problem 46.15 (6)
$f(y_1,y_2(y_1),y_3)$ cnf(clause$_1$, negated_conjecture)
$\neg f(y_2(y_1),y_3,y_4(y_1,y_3))$ cnf(clause$_2$, negated_conjecture)

SYN342+1.p Church problem 46.15 (7)
$\forall x_1\colon \exists x_2\colon \forall x_3\colon \exists x_4\colon (\text{big\_f}(x_1,x_2,x_3) \Rightarrow \text{big\_f}(x_4,x_4,x_1))$ fof(church_46_15$_7$, conjecture)

SYN342-1.p Church problem 46.15 (7)
$f(a,y_2,y_3(y_2))$ cnf(clause$_1$, negated_conjecture)
$\neg f(y_4,y_4,a)$ cnf(clause$_2$, negated_conjecture)

SYN343+1.p Church problem 46.16 (2)
$\exists x,y_1,y_2\colon \forall z\colon (((\text{big\_f}(x,y_1) \Rightarrow \text{big\_f}(z,x)) \Rightarrow \text{big\_f}(x,x)) \Rightarrow (\text{big\_f}(x,x) \text{ and } \text{big\_f}(y_1,y_2)))$ fof(church_46_16$_2$, conjectur

SYN343-1.p Church problem 46.16 (2)
$f(a,y_1)$ or $f(a,a)$ cnf(clause$_1$, negated_conjecture)
$f(z(y_1,y_2),a) \Rightarrow f(a,a)$ cnf(clause$_2$, negated_conjecture)
$f(a,a) \Rightarrow \neg f(y_1,y_2)$ cnf(clause$_3$, negated_conjecture)

SYN344+1.p Church problem 46.16 (3)

$\forall x\colon \exists y_1, y_2\colon \forall z\colon (((\text{big\_f}(x,z) \Rightarrow (\text{big\_f}(y_1,z) \Rightarrow \text{big\_f}(y_2,x))) \Rightarrow \text{big\_f}(x,x)) \Rightarrow (\text{big\_f}(x,x) \text{ and } (\text{big\_f}(y_1,y_2) \Rightarrow \text{big\_f}(z,z))))$ fof(church_46_16$_3$, conjecture)

SYN344-1.p Church problem 46.16 (3)
$f(a, z(y_1,y_2))$ or $f(a,a)$ cnf(clause$_1$, negated_conjecture)
$f(y_1, z(y_1,y_2))$ or $f(a,a)$ cnf(clause$_2$, negated_conjecture)
$f(y_2,a) \Rightarrow f(a,a)$ cnf(clause$_3$, negated_conjecture)
$f(a,a) \Rightarrow f(y_1,y_2)$ cnf(clause$_4$, negated_conjecture)
$f(a,a) \Rightarrow \neg f(z(y_1,y_2), z(y_1,y_2))$ cnf(clause$_5$, negated_conjecture)

SYN345+1.p Church problem 46.16 (4)
$\forall x_1, x_2\colon \exists y_1, y_2\colon \forall z\colon (((\text{big\_f}(x_1,x_2,y_1) \Rightarrow \text{big\_f}(y_2,y_1,z)) \Rightarrow (\text{big\_f}(x_1,x_1,x_2) \Rightarrow \text{big\_f}(x_1,x_2,x_2))) \Rightarrow (((\text{big\_f}(x_2,y_1,y_2) \Rightarrow \text{big\_f}(y_1,z,z)) \Rightarrow (\text{big\_f}(x_1,x_2,x_2) \Rightarrow \text{big\_f}(x_1,x_1,x_2))) \Rightarrow (\text{big\_f}(y_1,y_2,z) \Rightarrow (\text{big\_f}(x_2,x_2,y_1) \text{ and } \text{big\_f}(x_1,x_2,x_2))))))$ fof(church_46_16$_4$, conjecture)

SYN345-1.p Church problem 46.16 (4)
$f(a,a,b) \Rightarrow (f(a,b,y_1) \text{ or } f(a,b,b))$ cnf(clause$_1$, negated_conjecture)
$(f(y_2,y_1,z(y_1,y_2)) \text{ and } f(a,a,b)) \Rightarrow f(a,b,b)$ cnf(clause$_2$, negated_conjecture)
$f(a,b,b) \Rightarrow (f(b,y_1,y_2) \text{ or } f(a,a,b))$ cnf(clause$_3$, negated_conjecture)
$(f(y_1,z(y_1,y_2),z(y_1,y_2)) \text{ and } f(a,b,b)) \Rightarrow f(a,a,b)$ cnf(clause$_4$, negated_conjecture)
$f(y_1,y_2,z(y_1,y_2)) \text{ or } f(a,a,b) \text{ or } f(a,b,b)$ cnf(clause$_5$, negated_conjecture)
$(f(a,a,b) \text{ and } f(a,b,b)) \Rightarrow f(y_1,y_2,z(y_1,y_2))$ cnf(clause$_6$, negated_conjecture)
$f(b,b,y_1) \Rightarrow (f(a,a,b) \text{ or } f(a,b,b))$ cnf(clause$_7$, negated_conjecture)
$(f(b,b,y_1) \text{ and } f(a,a,b)) \Rightarrow \neg f(a,b,b)$ cnf(clause$_8$, negated_conjecture)

SYN346+1.p Church problem 46.17 (2)
$\forall x_1, x_2\colon \exists y_1, y_2\colon \forall z_1, z_2\colon (\text{big\_f}(x_2,z_1) \Rightarrow (\text{big\_f}(y_1,z_2) \Rightarrow ((\text{big\_f}(y_1,z_1) \text{ and } \text{big\_f}(y_2,z_1)) \text{ or } (\text{big\_f}(x_2,z_2) \text{ and } \text{big\_f}(y_2,z_2))))$

SYN346-1.p Church problem 46.17 (2)
$f(b, z_1(y_1,y_2))$ cnf(clause$_1$, negated_conjecture)
$f(y_1, z_2(y_1,y_2))$ cnf(clause$_2$, negated_conjecture)
$f(y_1, z_1(y_1,y_2)) \Rightarrow \neg f(y_2, z_1(y_1,y_2))$ cnf(clause$_3$, negated_conjecture)
$f(b, z_2(y_1,y_2)) \Rightarrow \neg f(y_2, z_2(y_1,y_2))$ cnf(clause$_4$, negated_conjecture)

SYN347+1.p Church problem 46.17 (3)
$\forall z_1, z_2\colon \exists x_1, x_2\colon \forall y\colon (((\text{big\_f}(x_1,y) \iff \text{big\_f}(x_2,y)) \iff \text{big\_f}(z_1,z_2)) \text{ or } (\text{big\_f}(z_1,y) \iff \text{big\_f}(z_2,y)))$ fof(church_46_

SYN347-1.p Church problem 46.17 (3)
$f(x_2, y(x_1,x_2)) \Rightarrow (f(x_1, y(x_1,x_2)) \text{ or } f(a,b))$ cnf(clause$_1$, negated_conjecture)
$f(x_1, y(x_1,x_2)) \Rightarrow (f(x_2, y(x_1,x_2)) \text{ or } f(a,b))$ cnf(clause$_2$, negated_conjecture)
$(f(x_1, y(x_1,x_2)) \text{ and } f(x_2, y(x_1,x_2))) \Rightarrow \neg f(a,b)$ cnf(clause$_3$, negated_conjecture)
$f(a,b) \Rightarrow (f(x_1, y(x_1,x_2)) \text{ or } f(x_2, y(x_1,x_2)))$ cnf(clause$_4$, negated_conjecture)
$f(a, y(x_1,x_2)) \text{ or } f(b, y(x_1,x_2))$ cnf(clause$_5$, negated_conjecture)
$f(a, y(x_1,x_2)) \Rightarrow \neg f(b, y(x_1,x_2))$ cnf(clause$_6$, negated_conjecture)

SYN348+1.p Church problem 46.17 (4)
$\exists x_1\colon \forall x_2\colon \exists x_3\colon \forall x_4\colon ((((\text{big\_f}(x_1,x_4) \iff \text{big\_f}(x_4,x_3)) \iff \text{big\_f}(x_3,x_4)) \iff \text{big\_f}(x_4,x_1)) \text{ and } (((\text{big\_f}(x_2,x_4) \iff \text{big\_f}(x_4,x_3)) \iff \text{big\_f}(x_3,x_4)) \iff \text{big\_f}(x_4,x_2)))$ fof(church_46_17$_4$, conjecture)

SYN348-1.p Church problem 46.17 (4)
$(f(x,g(x,y)) \text{ and } f(y,g(x,y)) \text{ and } f(w(x),g(x,y))) \Rightarrow (f(g(x,y),y) \text{ or } f(g(x,y),x) \text{ or } f(g(x,y),w(x)))$ cnf(clause$_1$, neg
$(f(x,g(x,y)) \text{ and } f(y,g(x,y)) \text{ and } f(g(x,y),w(x))) \Rightarrow (f(g(x,y),y) \text{ or } f(g(x,y),x) \text{ or } f(w(x),g(x,y)))$ cnf(clause$_2$, neg
$(f(g(x,y),y) \text{ and } f(y,g(x,y))) \Rightarrow (f(x,g(x,y)) \text{ or } f(g(x,y),x) \text{ or } f(w(x),g(x,y)) \text{ or } f(g(x,y),w(x)))$ cnf(clause$_3$, negat
$(f(g(x,y),y) \text{ and } f(y,g(x,y)) \text{ and } f(w(x),g(x,y)) \text{ and } f(g(x,y),w(x))) \Rightarrow (f(x,g(x,y)) \text{ or } f(g(x,y),x))$ cnf(clause$_4$, ne
$f(x,g(x,y)) \text{ or } f(g(x,y),y) \text{ or } f(y,g(x,y)) \text{ or } f(g(x,y),x) \text{ or } f(w(x),g(x,y)) \text{ or } f(g(x,y),w(x))$ cnf(clause$_5$, negated_con
$(f(w(x),g(x,y)) \text{ and } f(g(x,y),w(x))) \Rightarrow (f(x,g(x,y)) \text{ or } f(g(x,y),y) \text{ or } f(y,g(x,y)) \text{ or } f(g(x,y),x))$ cnf(clause$_6$, negat
$(f(x,g(x,y)) \text{ and } f(g(x,y),y) \text{ and } f(w(x),g(x,y))) \Rightarrow (f(y,g(x,y)) \text{ or } f(g(x,y),x) \text{ or } f(g(x,y),w(x)))$ cnf(clause$_7$, neg
$(f(x,g(x,y)) \text{ and } f(g(x,y),y) \text{ and } f(g(x,y),w(x))) \Rightarrow (f(y,g(x,y)) \text{ or } f(g(x,y),x) \text{ or } f(w(x),g(x,y)))$ cnf(clause$_8$, neg
$(f(x,g(x,y)) \text{ and } f(g(x,y),x)) \Rightarrow (f(g(x,y),y) \text{ or } f(y,g(x,y)) \text{ or } f(w(x),g(x,y)) \text{ or } f(g(x,y),w(x)))$ cnf(clause$_9$, negat
$(f(x,g(x,y)) \text{ and } f(g(x,y),x) \text{ and } f(w(x),g(x,y)) \text{ and } f(g(x,y),w(x))) \Rightarrow (f(g(x,y),y) \text{ or } f(y,g(x,y)))$ cnf(clause$_{10}$, n
$(f(g(x,y),y) \text{ and } f(g(x,y),x) \text{ and } f(w(x),g(x,y))) \Rightarrow (f(x,g(x,y)) \text{ or } f(y,g(x,y)) \text{ or } f(g(x,y),w(x)))$ cnf(clause$_{11}$, neg
$(f(g(x,y),y) \text{ and } f(g(x,y),x) \text{ and } f(g(x,y),w(x))) \Rightarrow (f(x,g(x,y)) \text{ or } f(y,g(x,y)) \text{ or } f(w(x),g(x,y)))$ cnf(clause$_{12}$, neg
$(f(y,g(x,y)) \text{ and } f(g(x,y),x) \text{ and } f(w(x),g(x,y))) \Rightarrow (f(x,g(x,y)) \text{ or } f(g(x,y),y) \text{ or } f(g(x,y),w(x)))$ cnf(clause$_{13}$, neg
$(f(y,g(x,y)) \text{ and } f(g(x,y),x) \text{ and } f(g(x,y),w(x))) \Rightarrow (f(x,g(x,y)) \text{ or } f(g(x,y),y) \text{ or } f(w(x),g(x,y)))$ cnf(clause$_{14}$, neg
$(f(x,g(x,y)) \text{ and } f(g(x,y),y) \text{ and } f(y,g(x,y)) \text{ and } f(g(x,y),x)) \Rightarrow (f(w(x),g(x,y)) \text{ or } f(g(x,y),w(x)))$ cnf(clause$_{15}$, n

$(f(x, g(x, y))$ and $f(g(x, y), y)$ and $f(y, g(x, y))$ and $f(g(x, y), x)$ and $f(w(x), g(x, y))) \Rightarrow \neg f(g(x, y), w(x))$ cnf(clause$_{16}$

SYN349+1.p Church problem 46.17 (5)
$\exists x_1 \colon \forall x_2 \colon \exists x_3 \colon \forall x_4 \colon ((\text{big\_f}(x_1, x_4) \iff \text{big\_f}(x_2, x_4)) \Rightarrow (((\text{big\_f}(x_1, x_4) \iff \text{big\_f}(x_4, x_3)) \iff \text{big\_f}(x_3, x_4)) \iff \text{big\_f}(x_4, x_2)))$ fof(church_46_17$_5$, conjecture)

SYN349-1.p Church problem 46.17 (5)
$f(w(x), g(x, y)) \Rightarrow f(x, g(x, y))$ cnf(clause$_1$, negated_conjecture)
$f(x, g(x, y)) \Rightarrow f(w(x), g(x, y))$ cnf(clause$_2$, negated_conjecture)
$(f(x, g(x, y))$ and $f(y, g(x, y))) \Rightarrow (f(g(x, y), y)$ or $f(g(x, y), w(x)))$ cnf(clause$_3$, negated_conjecture)
$(f(g(x, y), y)$ and $f(y, g(x, y))) \Rightarrow (f(x, g(x, y))$ or $f(g(x, y), w(x)))$ cnf(clause$_4$, negated_conjecture)
$f(x, g(x, y))$ or $f(g(x, y), y)$ or $f(y, g(x, y))$ or $f(g(x, y), w(x))$ cnf(clause$_5$, negated_conjecture)
$(f(x, g(x, y))$ and $f(g(x, y), y)) \Rightarrow (f(y, g(x, y))$ or $f(g(x, y), w(x)))$ cnf(clause$_6$, negated_conjecture)
$(f(x, g(x, y))$ and $f(g(x, y), w(x))) \Rightarrow (f(g(x, y), y)$ or $f(y, g(x, y)))$ cnf(clause$_7$, negated_conjecture)
$(f(g(x, y), y)$ and $f(g(x, y), w(x))) \Rightarrow (f(x, g(x, y))$ or $f(y, g(x, y)))$ cnf(clause$_8$, negated_conjecture)
$(f(y, g(x, y))$ and $f(g(x, y), w(x))) \Rightarrow (f(x, g(x, y))$ or $f(g(x, y), y))$ cnf(clause$_9$, negated_conjecture)
$(f(x, g(x, y))$ and $f(g(x, y), y)$ and $f(y, g(x, y))) \Rightarrow \neg f(g(x, y), w(x))$ cnf(clause$_{10}$, negated_conjecture)

SYN350+1.p Church problem 46.18 (2)
$\forall x \colon \exists y_1, y_2 \colon \forall z \colon ((\text{big\_f}(x, z) \iff \text{big\_f}(z, x)) \Rightarrow (\text{big\_f}(x, z) \iff (\text{big\_f}(y_2, z)$ and $(\text{big\_f}(y_1, z) \Rightarrow \text{big\_f}(y_1, y_2)))))$ fof(cl

SYN350-1.p Church problem 46.18 (2)
$f(a, z(x, y)) \Rightarrow f(z(x, y), a)$ cnf(clause$_1$, negated_conjecture)
$f(z(x, y), a) \Rightarrow f(a, z(x, y))$ cnf(clause$_2$, negated_conjecture)
$f(a, z(x, y))$ or $f(y, z(x, y))$ or $f(x, z(x, y))$ cnf(clause$_3$, negated_conjecture)
$(f(a, z(x, y))$ and $f(y, z(x, y))) \Rightarrow f(x, z(x, y))$ cnf(clause$_4$, negated_conjecture)
$f(x, y) \Rightarrow (f(a, z(x, y))$ or $f(y, z(x, y)))$ cnf(clause$_5$, negated_conjecture)
$(f(a, z(x, y))$ and $f(y, z(x, y))) \Rightarrow \neg f(x, y)$ cnf(clause$_6$, negated_conjecture)

SYN351+1.p Church problem 46.18 (3)
$\forall x_1, x_2 \colon \exists y_1, y_2 \colon \forall z \colon (\text{big\_f}(x_1, y_2, x_1, z) \Rightarrow ((\text{big\_f}(x_1, y_1, x_1, y_2) \iff \text{big\_f}(y_1, x_2, y_1, y_2)) \Rightarrow (\text{big\_f}(x_1, y_1, x_1, y_2) \Rightarrow ((\text{big\_f}(x_1, y_2, y_1, y_2) \Rightarrow \text{big\_f}(x_1, z, y_1, z))$ and $(\text{big\_f}(x_1, z, y_1, z) \Rightarrow (\text{big\_f}(x_1, y_1, x_1, y_2) \iff \text{big\_f}(x_1, y_2, y_1, y_2)))))))$ fo

SYN351-1.p Church problem 46.18 (3)
$f(a, y, a, z(x, y))$ cnf(clause$_1$, negated_conjecture)
$f(x, b, x, y) \Rightarrow f(a, x, a, y)$ cnf(clause$_2$, negated_conjecture)
$f(a, x, a, y) \Rightarrow f(x, b, x, y)$ cnf(clause$_3$, negated_conjecture)
$f(a, x, a, y)$ or $f(a, z(x, y), x, z(x, y))$ cnf(clause$_4$, negated_conjecture)
$f(a, x, a, y)$ or $f(a, y, x, y)$ cnf(clause$_5$, negated_conjecture)
$f(a, y, x, y)$ or $f(a, z(x, y), x, z(x, y))$ cnf(clause$_6$, negated_conjecture)
$(f(a, z(x, y), x, z(x, y))$ and $f(a, x, a, y)) \Rightarrow \neg f(a, y, x, y)$ cnf(clause$_7$, negated_conjecture)

SYN352+1.p Church problem 46.18 (4)
$\forall x_1, x_2 \colon \exists y_1, y_2 \colon \forall z \colon (\text{big\_f}(x_1, x_2) \Rightarrow ((\text{big\_f}(y_1, y_2) \Rightarrow (\text{big\_f}(x_2, z)$ or $\text{big\_f}(y_2, z))) \Rightarrow (((\text{big\_f}(y_1, y_2) \Rightarrow (\text{big\_f}(x_2, z) \iff \text{big\_f}(y_1, z))) \Rightarrow \text{big\_f}(z, z)) \Rightarrow (\text{big\_f}(y_1, y_2)$ and $(\text{big\_f}(y_1, z) \iff \text{big\_f}(y_2, z)))))))$ fof(church_46_18$_4$,

SYN352-1.p Church problem 46.18 (4)
$f(a, b)$ cnf(clause$_1$, negated_conjecture)
$f(x, y) \Rightarrow (f(b, z(x, y))$ or $f(y, z(x, y)))$ cnf(clause$_2$, negated_conjecture)
$f(x, y)$ or $f(z(x, y), z(x, y))$ cnf(clause$_3$, negated_conjecture)
$f(b, z(x, y))$ or $f(x, z(x, y))$ or $f(z(x, y), z(x, y))$ cnf(clause$_4$, negated_conjecture)
$(f(b, z(x, y))$ and $f(x, z(x, y))) \Rightarrow f(z(x, y), z(x, y))$ cnf(clause$_5$, negated_conjecture)
$(f(x, y)$ and $f(x, z(x, y))) \Rightarrow \neg f(y, z(x, y))$ cnf(clause$_6$, negated_conjecture)
$f(x, y) \Rightarrow (f(x, z(x, y))$ or $f(y, z(x, y)))$ cnf(clause$_7$, negated_conjecture)

SYN353+1.p Church problem 46.18 (5)
$\forall x \colon \exists y_1, y_2, y_3 \colon \forall z \colon ((\text{big\_f}(y_1, y_2, y_3) \Rightarrow (\text{big\_f}(x, x, z) \Rightarrow (\text{big\_f}(y_2, y_3, y_1)$ or $\text{big\_f}(y_3, y_1, y_2)))) \Rightarrow (((\text{big\_f}(y_3, y_1, y_2) \Rightarrow (\text{big\_f}(y_1, y_2, y_3)$ and $\text{big\_f}(y_2, y_3, y_1))) \iff \text{big\_f}(y_2, y_1, z)) \Rightarrow (((\text{big\_f}(y_2, y_3, y_1) \Rightarrow (\text{big\_f}(y_1, y_2, y_3)$ and $\text{big\_f}(y_3, y_1, y_2)))$ $\text{big\_f}(y_1, z, y_2)) \Rightarrow ((((\text{big\_f}(y_3, y_1, y_2) \Rightarrow \neg \text{big\_f}(y_2, y_3, y_1)) \Rightarrow \text{big\_f}(y_1, y_2, y_3)) \iff \text{big\_f}(z, y_2, y_1)) \Rightarrow ((\text{big\_f}(y_1, y_2, y_3)$ and $\text{big\_f}(y_2, y_3, y_1)$ and $\text{big\_f}(y_3, y_1, y_2)) \iff \text{big\_f}(z, z, z))))))$ fof(church_46_18$_5$, conjecture)

SYN353-1.p Church problem 46.18 (5)
$(f(y_1, y_2, y_3)$ and $f(a, a, z(y_1, y_2, y_3))) \Rightarrow (f(y_2, y_3, y_1)$ or $f(y_3, y_1, y_2))$ cnf(clause$_1$, negated_conjecture)
$(f(y_3, y_1, y_2)$ and $f(y_2, y_1, z(y_1, y_2, y_3))) \Rightarrow f(y_1, y_2, y_3)$ cnf(clause$_2$, negated_conjecture)
$(f(y_3, y_1, y_2)$ and $f(y_2, y_1, z(y_1, y_2, y_3))) \Rightarrow f(y_2, y_3, y_1)$ cnf(clause$_3$, negated_conjecture)

$f(y_3, y_1, y_2)$ or $f(y_2, y_1, z(y_1, y_2, y_3))$ cnf(clause$_4$, negated_conjecture)
$(f(y_1, y_2, y_3)$ and $f(y_2, y_3, y_1)) \Rightarrow f(y_2, y_1, z(y_1, y_2, y_3))$ cnf(clause$_5$, negated_conjecture)
$(f(y_2, y_3, y_1)$ and $f(y_1, z(y_1, y_2, y_3), y_2)) \Rightarrow f(y_1, y_2, y_3)$ cnf(clause$_6$, negated_conjecture)
$(f(y_2, y_3, y_1)$ and $f(y_1, z(y_1, y_2, y_3), y_2)) \Rightarrow f(y_3, y_1, y_2)$ cnf(clause$_7$, negated_conjecture)
$f(y_2, y_3, y_1)$ or $f(y_1, z(y_1, y_2, y_3), y_2)$ cnf(clause$_8$, negated_conjecture)
$(f(y_1, y_2, y_3)$ and $f(y_3, y_1, y_2)) \Rightarrow f(y_1, z(y_1, y_2, y_3), y_2)$ cnf(clause$_9$, negated_conjecture)
$f(z(y_1, y_2, y_3), y_2, y_1) \Rightarrow (f(y_3, y_1, y_2)$ or $f(y_1, y_2, y_3))$ cnf(clause$_{10}$, negated_conjecture)
$f(z(y_1, y_2, y_3), y_2, y_1) \Rightarrow (f(y_2, y_3, y_1)$ or $f(y_1, y_2, y_3))$ cnf(clause$_{11}$, negated_conjecture)
$(f(y_3, y_1, y_2)$ and $f(y_2, y_3, y_1)) \Rightarrow f(z(y_1, y_2, y_3), y_2, y_1)$ cnf(clause$_{12}$, negated_conjecture)
$f(y_1, y_2, y_3) \Rightarrow f(z(y_1, y_2, y_3), y_2, y_1)$ cnf(clause$_{13}$, negated_conjecture)
$f(y_1, y_2, y_3)$ or $f(z(y_1, y_2, y_3), z(y_1, y_2, y_3), z(y_1, y_2, y_3))$ cnf(clause$_{14}$, negated_conjecture)
$f(y_2, y_3, y_1)$ or $f(z(y_1, y_2, y_3), z(y_1, y_2, y_3), z(y_1, y_2, y_3))$ cnf(clause$_{15}$, negated_conjecture)
$f(y_3, y_1, y_2)$ or $f(z(y_1, y_2, y_3), z(y_1, y_2, y_3), z(y_1, y_2, y_3))$ cnf(clause$_{16}$, negated_conjecture)
$(f(y_1, y_2, y_3)$ and $f(y_2, y_3, y_1)$ and $f(y_3, y_1, y_2)) \Rightarrow \neg f(z(y_1, y_2, y_3), z(y_1, y_2, y_3), z(y_1, y_2, y_3))$ cnf(clause$_{17}$, negated_conje

SYN354+1.p Church problem 46.20 (1)
$\forall x_1, x_2$: $\exists y_1, y_2$: $\forall z$: (big_f$(x_1, x_2) \Rightarrow$ (big_g$(x_1, x_2) \Rightarrow$ (((big_g$(x_2, z) \iff$ big_g$(y_2, z)) \Rightarrow$ (big_f$(y_1, y_2) \Rightarrow$
big_f$(x_2, y_2))) \Rightarrow$ ((big_g$(x_2, z) \iff$ big_g$(y_1, z)) \Rightarrow$ (big_f(x_1, y_1) and big_f(x_2, y_1) and big_f$(y_1, y_2))))))$ fof(church_46_

SYN354-1.p Church problem 46.20 (1)
$f(a, b)$ cnf(clause$_1$, negated_conjecture)
$g(a, b)$ cnf(clause$_2$, negated_conjecture)
$f(y_1, y_2) \Rightarrow (g(b, z(y_1, y_2))$ or $g(y_2, z(y_1, y_2))$ or $f(b, y_2))$ cnf(clause$_3$, negated_conjecture)
$(g(b, z(y_1, y_2))$ and $g(y_2, z(y_1, y_2))$ and $f(y_1, y_2)) \Rightarrow f(b, y_2)$ cnf(clause$_4$, negated_conjecture)
$g(y_1, z(y_1, y_2)) \Rightarrow g(b, z(y_1, y_2))$ cnf(clause$_5$, negated_conjecture)
$g(b, z(y_1, y_2)) \Rightarrow g(y_1, z(y_1, y_2))$ cnf(clause$_6$, negated_conjecture)
$(f(a, y_1)$ and $f(b, y_1)) \Rightarrow \neg f(y_1, y_2)$ cnf(clause$_7$, negated_conjecture)

SYN355+1.p Peter Andrews Problem X2106
$(\forall x$: (big_r$(x) \Rightarrow$ big_p$(x))$ and $\forall x$: $(\neg$ big_q$(x) \Rightarrow$ big_r$(x))) \Rightarrow \forall x$: (big_p$(x)$ or big_q$(x))$ fof(x_{2106}, conjecture)

SYN355∧5.p TPS problem X2106
cQ: \$i → \$o thf(cQ, type)
cP: \$i → \$o thf(cP, type)
cR: \$i → \$o thf(cR, type)
(∀xx: \$i: ((cR@xx) ⇒ (cP@xx)) and ∀xx: \$i: (¬ cQ@xx ⇒ (cR@xx))) ⇒ ∀xx: \$i: (cP@xx or cQ@xx) thf(cX$_{2106}$, conjec

SYN356+1.p Peter Andrews Problem X2107
(big_r(a, b) and $\forall x, y$: (big_r$(x, y) \Rightarrow$ (big_r(y, x) and big_q$(x, y)))$ and $\forall u, v$: (big_q$(u, v) \Rightarrow$ big_q$(u, u))) \Rightarrow$
(big_q(a, a) and big_q$(b, b))$ fof(x_{2107}, conjecture)

SYN356∧5.p TPS problem from BASIC-FO-THMS
cB: \$i thf(cB, type)
cQ: \$i → \$i → \$o thf(cQ, type)
cA: \$i thf(cA, type)
cR: \$i → \$i → \$o thf(cR, type)
(cR@cA@cB and ∀x: \$i, y: \$i: ((cR@x@y) ⇒ (cR@y@x and cQ@x@y)) and ∀u: \$i, v: \$i: ((cQ@u@v) ⇒ (cQ@u@u))) ⇒
(cQ@cA@cA and cQ@cB@cB) thf(cLX$_{2107}$, conjecture)

SYN357+1.p Peter Andrews Problem X2108
$\forall x$: $\exists y$: (big_p$(x) \Rightarrow$ big_p$(y))$ fof(x_{2108}, conjecture)

SYN357∧5.p TPS problem from BASIC-FO-THMS
cP: \$i → \$o thf(cP, type)
∀x: \$i: ∃y: \$i: ((cP@x) ⇒ (cP@y)) thf(cLX$_{2108}$, conjecture)

SYN357∧7.p Peter Andrews Problem X2108
include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')
big_p: mu → \$i → \$o thf(big_p_type, type)
mvalid@(mbox_s$_4$@(mforall_ind@λx: mu: (mexists_ind@λy: mu: (mbox_s$_4$@(mimplies@(mbox_s$_4$@(big_p@x))@(mbox_s$_4$@(big

SYN358+1.p Peter Andrews Problem X2109
$\exists x$: (p and big_q$(x)) \iff (p$ and $\exists x$: big_q$(x))$ fof(x_{2109}, conjecture)

SYN358∧5.p TPS problem X2109
cQ: $i → $o thf(cQ, type)
p: $o thf($p$, type)
∃xx: $i: ($p$ and cQ@xx) ⟺ (p and ∃xx: $i: (cQ@xx)) thf(cX$_{2109}$, conjecture)

SYN359+1.p Peter Andrews Problem X2110
(∃x: big_r(x) and ∀y: (big_r(y) ⇒ ∃z: big_q(y, z)) and ∀x, y: (big_q(x, y) ⇒ big_q(x, x))) ⇒ ∃x, y: (big_q(x, y) and big_r(y)

SYN360+1.p Peter Andrews Problem X2111
(∀x: (∃y: big_p(x, y) ⇒ ∀y: big_q(x, y)) and ∀z: ∃y: big_p(z, y)) ⇒ ∀y, x: big_q(x, y) fof(x_{2111}, conjecture)

SYN360∧5.p TPS problem X2111A
Variant of X2111 for testing infix mechanism.
cQ: $i → $i → $o thf(cQ, type)
c_less_: $i → $i → $o thf(c_less_, type)
(∀xx: $i: (∃xy: $i: (c_less_@xx@xy) ⇒ ∀xy: $i: (cQ@xx@xy)) and ∀xz: $i: ∃xy: $i: (c_less_@xz@xy)) ⇒ ∀xy: $i, xx: $i: (cQ@x

SYN361+1.p Peter Andrews Problem X2112
(∃v: ∀x: big_p(x, v) and ∀x: (big_s(x) ⇒ ∃y: big_q(y, x)) and ∀x, y: (big_p(x, y) ⇒ ¬ big_q(x, y))) ⇒ ∃u: ¬ big_s(u) fof(

SYN361∧5.p TPS problem X2112
cS: $i → $o thf(cS, type)
cQ: $i → $i → $o thf(cQ, type)
cP: $i → $i → $o thf(cP, type)
(∃xv: $i: ∀xx: $i: (cP@xx@xv) and ∀xx: $i: ((cS@xx) ⇒ ∃xy: $i: (cQ@xy@xx)) and ∀xx: $i, xy: $i: ((cP@xx@xy) ⇒
¬ cQ@xx@xy)) ⇒ ∃xu: $i: ¬ cS@xu thf(cX$_{2112}$, conjecture)

SYN362+1.p Peter Andrews Problem X2113
(∀y: ∃w: big_r(y, w) and ∃z: ∀x: (big_p(x) ⇒ ¬ big_r(z, x))) ⇒ ∃x: ¬ big_p(x) fof(x_{2113}, conjecture)

SYN363+1.p Peter Andrews Problem X2114
(∀x: big_r(x, b) and ∀y: (∃z: big_r(y, z) ⇒ big_r(a, y))) ⇒ ∃u: ∀v: big_r(u, v) fof(x_{2114}, conjecture)

SYN364+1.p Peter Andrews Problem X2115
(∀x: (∃y: big_p(x, y) ⇒ ∀z: big_p(z, z)) and ∀u: ∃v: (big_p(u, v) or (big_m(u) and big_q($f(u, v)$))) and ∀w: (big_q(w) ⇒
¬ big_m($g(w)$))) ⇒ ∀u: ∃v: (big_p($g(u), v$) and big_p(u, u)) fof(x_{2115}, conjecture)

SYN364∧5.p TPS problem X2115
cP: $i → $i → $o thf(cP, type)
g: $i → $i thf($g$, type)
cM: $i → $o thf(cM, type)
cQ: $i → $o thf(cQ, type)
f: $i → $i → $i thf($f$, type)
(∀xx: $i: (∃xy: $i: (cP@xx@xy) ⇒ ∀xz: $i: (cP@xz@xz)) and ∀xu: $i: ∃xv: $i: (cP@xu@xv or (cM@xu and cQ@(f@xu@xv)))
¬ cM@(g@xw))) ⇒ ∀xu: $i: ∃xv: $i: (cP@($g$@xu)@xv and cP@xu@xu) thf(cX$_{2115}$, conjecture)

SYN365+1.p Peter Andrews Problem X2116
(∀x: ∃y: (big_p(x) ⇒ (big_r($x, g(h(y))$) and big_p(y))) and ∀w: (big_p(w) ⇒ (big_p($g(w)$) and big_p($h(w)$)))) ⇒
∀x: (big_p(x) ⇒ ∃y: (big_r(x, y) and big_p(y))) fof(x_{2116}, conjecture)

SYN365∧5.p TPS problem X2116
cP: $i → $o thf(cP, type)
cR: $i → $i → $o thf(cR, type)
h: $i → $i thf($h$, type)
g: $i → $i thf($g$, type)
(∀xx: $i: ∃xy: $i: ((cP@xx) ⇒ (cR@xx@($g$@($h$@xy)) and cP@xy)) and ∀xw: $i: ((cP@xw) ⇒ (cP@($g$@xw) and cP@($h$@xw)
∀xx: $i: ((cP@xx) ⇒ ∃xy: $i: (cR@xx@xy and cP@xy)) thf(cX$_{2116}$, conjecture)

SYN366+1.p Peter Andrews Problem X2117
(∀u, v: (big_r(u, u) ⟺ big_r(u, v)) and ∀w, z: (big_r(w, w) ⟺ big_r(z, w))) ⇒ (∃x: big_r(x, x) ⇒ ∀y: big_r(y, y)) fof

SYN367+1.p Peter Andrews Problem X2118
∀x: ((p and big_q(x)) or (¬ p and big_r(x))) ⇒ (∀x: big_q(x) or ∀x: big_r(x)) fof(x_{2118}, conjecture)

SYN367∧7.p Peter Andrews Problem X2118
include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')

p: $\$i \to \$o$ thf(p_type, type)
big_r: $\mu \to \$i \to \$o$ thf(big_r_type, type)
big_q: $\mu \to \$i \to \$o$ thf(big_q_type, type)
mvalid@(mbox_s4@(mimplies@(mbox_s4@(mforall_ind@λx: mu: (mor@(mand@(mbox_s4@p)@(mbox_s4@(big_q@x)))@(mand

SYN368+1.p Peter Andrews Problem X2119
$\exists y$: $\forall x$: (big_p(y) $\Rightarrow$ big_p(x)) fof(x_{2119}, conjecture)

SYN369+1.p Peter Andrews Problem X2120
$\forall u, v, w$: (big_p(u, v) or big_p(v, w)) $\Rightarrow$ $\exists x$: $\forall y$: big_p(x, y) fof(x_{2120}, conjecture)

SYN370+1.p Peter Andrews Problem X2121
$\exists v$: $\forall y$: $\exists z$: ((big_p($a, y, h(y)$) or big_p($v, y, f(y)$)) $\Rightarrow$ big_p(v, y, z)) fof(x_{2121}, conjecture)

SYN371+1.p Peter Andrews Problem X2122
($\exists x$: big_r(x, x) $\Rightarrow$ $\forall y$: big_r(y, y)) $\Rightarrow$ $\exists u$: $\forall v$: (big_r(u, u) $\Rightarrow$ big_r(v, v)) fof(x_{2122}, conjecture)

SYN372+1.p Peter Andrews Problem X2123
$\forall x$: ($\exists y$: (big_p(y) $\Rightarrow$ big_q(x)) $\Rightarrow$ $\exists y$: (big_p(y) $\Rightarrow$ big_q(y))) fof(x_{2123}, conjecture)

SYN373+1.p Peter Andrews Problem X2124
$\exists x$: (big_p(x) $\Rightarrow$ big_q(x)) $\iff$ ($\forall x$: big_p(x) $\Rightarrow$ $\exists x$: big_q(x)) fof(x_{2124}, conjecture)

SYN374+1.p Peter Andrews Problem X2125
$\exists x$: $\forall y$: (big_p(x) $\iff$ big_p(y)) $\iff$ ($\exists x$: big_p(x) $\iff$ $\forall y$: big_p(y)) fof(x_{2125}, conjecture)

SYN374∧5.p TPS problem X2125
cP: $\$i \to \$o$ thf(cP, type)
$\exists$xx: \$i: $\forall$xy: \$i: ((cP@xx) $\iff$ (cP@xy)) $\iff$ ($\exists$xx: \$i: (cP@xx) $\iff$ $\forall$xy: \$i: (cP@xy)) thf(cX_{2125}, conjecture)

SYN375+1.p Peter Andrews Problem X2126
$\forall x$: (big_p(x) $\iff$ $\exists y$: big_p(y)) $\iff$ ($\forall x$: big_p(x) $\iff$ $\exists y$: big_p(y)) fof(x_{2126}, conjecture)

SYN375∧5.p TPS problem from BASIC-FO-THMS
cP: $\$i \to \$o$ thf(cP, type)
(($\forall$xx: \$i: (cP@xx) $\Rightarrow$ $\exists$xy: \$i: (cP@xy)) and ($\exists$xy: \$i: (cP@xy) $\Rightarrow$ $\forall$xx: \$i: (cP@xx))) $\Rightarrow$ ($\exists$xy: \$i: (cP@xy) $\iff$ $\forall$xx: \$i: (cP@xx)) thf(cX2126_BUG, conjecture)

SYN376+1.p Peter Andrews Problem X2127
$\exists x$: $\forall y$: (big_p(y) $\iff$ big_p(x)) $\Rightarrow$ ($\forall x$: big_p(x) or $\forall x$: $\neg$ big_p(x)) fof(x_{2127}, conjecture)

SYN377+1.p Peter Andrews Problem X2128
$\forall x$: (big_p(x) $\iff$ $\forall y$: big_p(y)) $\iff$ ($\exists x$: big_p(x) $\iff$ $\forall y$: big_p(y)) fof(x_{2128}, conjecture)

SYN377∧5.p TPS problem X2128
cP: $\$i \to \$o$ thf(cP, type)
$\forall$xx: \$i: ((cP@xx) $\iff$ $\forall$xy: \$i: (cP@xy)) $\iff$ ($\exists$xx: \$i: (cP@xx) $\iff$ $\forall$xy: \$i: (cP@xy)) thf(cX_{2128}, conjecture)

SYN377∧7.p Peter Andrews Problem X2128
include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')
big_p: $\mu \to \$i \to \$o$ thf(big_p_type, type)
mvalid@(mand@(mbox_s4@(mimplies@(mbox_s4@(mforall_ind@λx: mu: (mand@(mbox_s4@(mimplies@(mbox_s4@(big_p@x))

SYN378+1.p Peter Andrews Problem X2130
$\forall x$: big_p(x) $\Rightarrow$ ($\neg$ $\exists y$: big_q(y) or $\exists z$: (big_p(z) $\Rightarrow$ big_q(z))) fof(x_{2130}, conjecture)

SYN379+1.p Peter Andrews Problem X2131
$\forall x$: big_p(x) $\Rightarrow$ $\exists y$: ($\forall x, z$: big_q(x, y, z) $\Rightarrow$ $\neg$ $\forall z$: (big_p(z) and $\neg$ big_q(y, y, z))) fof(x_{2131}, conjecture)

SYN380+1.p Peter Andrews Problem X2132
$\forall w$: $\neg$ big_r(w, w) $\Rightarrow$ $\exists x, y$: ($\neg$ big_r(x, y) and (big_q(y, x) $\Rightarrow$ $\forall z$: big_q(z, z))) fof(x_{2132}, conjecture)

SYN381+1.p Peter Andrews Problem X2133
($\forall x$: ($\exists y$: big_q(x, y) $\Rightarrow$ big_p(x)) and $\forall v$: $\exists u$: big_q(u, v) and $\forall w, z$: (big_q(w, z) $\Rightarrow$ (big_q(z, w) or big_q(z, z)))) $\Rightarrow$ $\forall z$: big_p(z) fof(x_{2133}, conjecture)

SYN381∧5.p TPS problem X2133
cP: $\$i \to \$o$ thf(cP, type)
cQ: $\$i \to \$i \to \$o$ thf(cQ, type)

(∀xx: $i: (∃xy: $i: (cQ@xx@xy) ⇒ (cP@xx)) and ∀xv: $i: ∃xu: $i: (cQ@xu@xv) and ∀xw: $i, xz: $i: ((cQ@xw@xz) ⇒ (cQ@xz@xw or cQ@xz@xz))) ⇒ ∀xz: $i: (cP@xz) thf(cX$_{2133}$, conjecture)

SYN382+1.p Peter Andrews Problem X2134
∀z: ∃x: (∀y: big_p(x, y) or big_q(x, z)) ⇒ ∀y: ∃x: (big_p(x, y) or big_q(x, y)) fof(x_{2134}, conjecture)

SYN382∧5.p TPS problem X2134
cQ: $i → $i → $o thf(cQ, type)
cP: $i → $i → $o thf(cP, type)
∀xz: $i: ∃xx: $i: (∀xy: $i: (cP@xx@xy) or cQ@xx@xz) ⇒ ∀xy: $i: ∃xx: $i: (cP@xx@xy or cQ@xx@xy) thf(cX$_{2134}$, conjectu

SYN383+1.p Peter Andrews Problem X2135
∃x: ∀y: ((big_p(x) and big_q(y)) ⇒ (big_q(x) or big_p(y))) fof(x_{2135}, conjecture)

SYN384+1.p Peter Andrews Problem X2136
∀z: ∃x, y: ∀u: (big_p(x, y, z) ⇒ big_p(u, x, x)) fof(x_{2136}, conjecture)

SYN385+1.p Peter Andrews Problem X2137
∃x: ∀y: (big_p(x) ⇒ (big_q(x) or big_p(y))) fof(x_{2137}, conjecture)

SYN386+1.p Peter Andrews Problem X2138
(∀x: ∃y: big_f(x, y) and ∃x: ∀e: ∃n: ∀w: (big_s(n, w) ⇒ big_d(w, x, e)) and ∀e: ∃d: ∀a, b: (big_d(a, b, d) ⇒ ∀y, z: ((big_f(a, y) and big_f(b, z)) ⇒ big_d(y, z, e)))) ⇒ ∃y: ∀e: ∃m: ∀w: (big_s(m, w) ⇒ ∀z: (big_f(w, z) ⇒ big_d(z, y, e))) fof(x_{2138}, conjecture)

SYN386∧5.p TPS problem X2138
cD: $i → $i → $i → $o thf(cD, type)
cF: $i → $i → $o thf(cF, type)
cS: $i → $i → $o thf(cS, type)
(∀xx: $i: ∃xy: $i: (cF@xx@xy) and ∃xx: $i: ∀xe: $i: ∃xn: $i: ∀xw: $i: ((cS@xn@xw) ⇒ (cD@xw@xx@xe)) and ∀xe: $i: ∃xd: $i:
∀xy: $i, xz: $i: ((cF@xa@xy and cF@xb@xz) ⇒ (cD@xy@xz@xe)))) ⇒ ∃xy: $i: ∀xe: $i: ∃xm: $i: ∀xw: $i: ((cS@xm@xw) ⇒
∀xz: $i: ((cF@xw@xz) ⇒ (cD@xz@xy@xe))) thf(cX$_{2138}$, conjecture)

SYN387+1.p The Law of Excluded Middle
The Law of Excluded Middle: can be quite difficult for 'natural' systems.
p or ¬ p fof(pel$_6$, conjecture)

SYN387∧4.p The Law of Excluded Middle
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
ivalid@(ior@(iatom@p)@(inot@(iatom@p))) thf(pel$_6$, conjecture)

SYN387∧7.p The Law of Excluded Middle
include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')
p: $i → $o thf(p_type, type)
mvalid@(mor@(mbox_s$_4$@p)@(mbox_s$_4$@(mnot@(mbox_s$_4$@p)))) thf(pel$_6$, conjecture)

SYN388+1.p Expanded Law of Excluded Middle
Expanded Law of Excluded Middle. The strategies of the original Logic Theorist cannot prove this.
p or ¬ ¬ ¬ p fof(pel$_7$, conjecture)

SYN388∧4.p Expanded Law of Excluded Middle
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
ivalid@(ior@(iatom@p)@(inot@(inot@(inot@(iatom@p))))) thf(pel$_7$, conjecture)

SYN389+1.p Pierce's Law
Pierce's Law. Unprovable by Logic Theorist, and tricky for 'natural' systems.
(((p ⇒ q) ⇒ p) ⇒ p fof(pel$_8$, conjecture)

SYN389∧4.p Pierce's Law
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
q: $i → $o thf(q_type, type)
ivalid@(iimplies@(iimplies@(iimplies@(iatom@p)@(iatom@q))@(iatom@p))@(iatom@p)) thf(pel$_8$, conjecture)

SYN390+1.p Pelletier 11

A simple problem designed to see whether 'natural' systems can do it efficiently (or whether they incorrectly try to prove the → each way).
$p \iff p$ fof(pel_{11}, conjecture)

SYN390^4.p Pelletier 11
include('Axioms/LCL010^0.ax')
p: $i → $o thf(p_type, type)
ivalid@(iequiv@(iatom@p)@(iatom@p)) thf(pel_{11}, conjecture)

SYN391+1.p Pelletier 9
$((p_1 \text{ or } p_2) \text{ and } (\neg p_1 \text{ or } p_2)) \Rightarrow \neg\neg p_1 \text{ or } \neg p_2$ fof(pel_9, conjecture)

SYN391^4.p Pelletier 9
include('Axioms/LCL010^0.ax')
p_1: $i → $o thf(p1_type, type)
p_2: $i → $o thf(p2_type, type)
ivalid@(iimplies@(iand@(ior@(iatom@p_1)@(iatom@p_2))@(iand@(ior@(inot@(iatom@p_1))@(iatom@p_2))@(ior@(iatom@p_1)@(i

SYN392+1.p Pelletier 14
$(p_1 \iff p_2) \iff ((p_2 \text{ or } \neg p_1) \text{ and } (\neg p_2 \text{ or } p_1))$ fof(pel_{14}, conjecture)

SYN392^4.p Pelletier 14
include('Axioms/LCL010^0.ax')
p_1: $i → $o thf(p1_type, type)
p_2: $i → $o thf(p2_type, type)
ivalid@(iequiv@(iequiv@(iatom@p_1)@(iatom@p_2))@(iand@(ior@(iatom@p_2)@(inot@(iatom@p_1)))@(ior@(inot@(iatom@p_2))@

SYN393+1.003.p Pelletier 12
$((p_1 \iff p_2) \iff p_3) \iff (p_1 \iff (p_2 \iff p_3))$ fof(pel_{12}, conjecture)

SYN393^4.002.p ILTP Problem SYJ206+1.002
include('Axioms/LCL010^0.ax')
a_1: $i → $o thf(a1_type, type)
a_2: $i → $o thf(a2_type, type)
ivalid@(iequiv@(iequiv@(iatom@a_1)@(iatom@a_2))@(iequiv@(iatom@a_2)@(iatom@a_1))) thf(con, conjecture)

SYN393^4.003.p Pelletier 12
include('Axioms/LCL010^0.ax')
p_1: $i → $o thf(p1_type, type)
p_2: $i → $o thf(p2_type, type)
p_3: $i → $o thf(p3_type, type)
ivalid@(iequiv@(iequiv@(iequiv@(iatom@p_1)@(iatom@p_2))@(iatom@p_3))@(iequiv@(iatom@p_1)@(iequiv@(iatom@p_2)@(iatom

SYN393^4.004.p ILTP Problem SYJ206+1.004
include('Axioms/LCL010^0.ax')
a_1: $i → $o thf(a1_type, type)
a_2: $i → $o thf(a2_type, type)
a_3: $i → $o thf(a3_type, type)
a_4: $i → $o thf(a4_type, type)
ivalid@(iequiv@(iequiv@(iequiv@(iequiv@(iatom@a_1)@(iatom@a_2))@(iatom@a_3))@(iatom@a_4))@(iequiv@(iatom@a_4)@(iequ

SYN394+1.p Kalish and Montague Problem 201
Laws of distribution.
$\forall x\colon (f(x) \Rightarrow g(x)) \Rightarrow (\forall y\colon f(y) \Rightarrow \forall z\colon g(z))$ fof(kalish_{201}, conjecture)

SYN395+1.p Kalish and Montague Problem 202
Laws of distribution.
$\forall x\colon (f(x) \Rightarrow g(x)) \Rightarrow (\exists y\colon f(y) \Rightarrow \exists z\colon g(z))$ fof(kalish_{202}, conjecture)

SYN396+1.p Kalish and Montague Problem 203
Laws of quantifier negation.
$\neg\forall x\colon f(x) \iff \exists y\colon \neg f(y)$ fof(kalish_{203}, conjecture)

SYN397+1.p Kalish and Montague Problem 204
Laws of quantifier negation.
$\neg\exists x\colon f(x) \iff \forall y\colon \neg f(y)$ fof(kalish_{204}, conjecture)

SYN397^7.p Kalish and Montague Problem 204

include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')
f: mu → $i → $o thf(f_type, type)
mvalid@(mand@(mbox_s4@(mimplies@(mbox_s4@(mnot@(mexists_ind@λx: mu: (mbox_s4@($f@x)))))@(mbox_s4@(mforall_in

SYN398+1.p Kalish and Montague Problem 215
Laws of confinement.
$\forall x\colon (p \text{ and } f(x)) \iff (p \text{ and } \forall y\colon f(y))$ fof(kalish$_{215}$, conjecture)

SYN399+1.p Kalish and Montague Problem 223
Laws of confinement.
$\forall x\colon (f(x) \iff p) \Rightarrow (\forall y\colon f(y) \iff p)$ fof(kalish$_{223}$, conjecture)

SYN400+1.p Kalish and Montague Problem 227
Laws of vacuous quantification.
$\forall x\colon p \iff p$ fof(kalish$_{227}$, conjecture)

SYN401+1.p Kalish and Montague Problem 229
Laws of vacuous quantification.
$\forall x\colon (\forall y\colon f(y) \Rightarrow f(x))$ fof(kalish$_{229}$, conjecture)

SYN402+1.p Kalish and Montague Problem 230
Laws of vacuous quantification.
$\forall x\colon (f(x) \Rightarrow \exists y\colon f(y))$ fof(kalish$_{230}$, conjecture)

SYN403+1.p Kalish and Montague Problem 234
Laws of alphabetic variance.
$\forall x\colon (((f(x) \Rightarrow g(x)) \text{ and } (g(x) \Rightarrow h(x))) \Rightarrow (f(x) \Rightarrow h(x)))$ fof(kalish$_{234}$, conjecture)

SYN404+1.p Kalish and Montague Problem 238
Laws of alphabetic variance.
$\forall x\colon f(x) \Rightarrow \exists y\colon f(y)$ fof(kalish$_{238}$, conjecture)

SYN405+1.p Kalish and Montague Problem 239
Laws of alphabetic variance.
$(\forall x\colon f(x) \text{ and } \exists y\colon g(y)) \Rightarrow \exists z\colon (f(z) \text{ and } g(z))$ fof(kalish$_{239}$, conjecture)

SYN406+1.p Kalish and Montague Problem 240
Laws of alphabetic variance.
$(\forall x\colon (f(x) \Rightarrow g(x)) \text{ and } \exists y\colon (f(y) \text{ and } h(y))) \Rightarrow \exists z\colon (g(z) \text{ and } h(z))$ fof(kalish$_{240}$, conjecture)

SYN407+1.p Kalish and Montague Problem 241
Laws of alphabetic variance.
$\forall x\colon (f(x) \Rightarrow (g(x) \text{ or } h(x))) \Rightarrow (\forall y\colon (f(y) \Rightarrow g(y)) \text{ or } \exists z\colon (f(z) \text{ and } h(z)))$ fof(kalish$_{241}$, conjecture)

SYN407∧7.p Kalish and Montague Problem 241
include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')
h: mu → $i → $o thf(h_type, type)
g: mu → $i → $o thf(g_type, type)
f: mu → $i → $o thf(f_type, type)
mvalid@(mbox_s4@(mimplies@(mbox_s4@(mforall_ind@λx: mu: (mbox_s4@(mimplies@(mbox_s4@($f@x))@(mor@(mbox_s4@(

SYN408+1.p Kalish and Montague Problem 244
Laws of alphabetic variance.
$\neg\, \exists x\colon f(x) \Rightarrow \forall y\colon (f(y) \Rightarrow g(y))$ fof(kalish$_{244}$, conjecture)

SYN409+1.p Kalish and Montague Problem 246
Laws of alphabetic variance.
$\forall x\colon f(x) \iff \forall y, z\colon (f(y) \text{ and } f(z))$ fof(kalish$_{246}$, conjecture)

SYN410+1.p Kalish and Montague Problem 249
$\forall x, y\colon f(x, y) \Rightarrow \exists u, v\colon f(u, v)$ fof(kalish$_{249}$, conjecture)

SYN411+1.p Kalish and Montague Problem 250
$\forall x, y, z\colon f(x, y, z) \iff \neg\, \exists u, v, w\colon \neg\, f(u, v, w)$ fof(kalish$_{250}$, conjecture)

SYN412+1.p Kalish and Montague Problem 255
$\neg\,\exists x\colon \forall y\colon (f(x,y) \iff \neg\, f(x,x))$ fof(kalish$_{255}$, conjecture)

SYN413+1.p Kalish and Montague Problem 256
$\forall z\colon \exists y\colon \forall x\colon (f(x,y) \iff (f(x,z) \text{ and } \neg\, f(x,x))) \Rightarrow \neg\,\exists v\colon \forall u\colon f(u,v)$ fof(kalish$_{256}$, conjecture)

SYN414+1.p Kalish and Montague Problem 265
$\forall x\colon (\exists y\colon (h(x,y) \text{ and } f(y)) \Rightarrow \exists z\colon (h(x,z) \text{ and } g(z))) \iff \forall u,v,w\colon ((h(u,v) \text{ and } f(v)) \Rightarrow (h(u,w) \text{ and } g(w)))$ fof(kalis

SYN415+1.p Kalish and Montague Problem 317
$(\exists x\colon f(x) \text{ and } \forall y,z\colon ((f(y) \text{ and } f(z)) \Rightarrow y = z)) \iff \exists u\colon (f(u) \text{ and } \forall v\colon (f(v) \Rightarrow u = v))$ fof(kalish$_{317}$, conjecture)

SYN416+1.p Pelletier Problem 16
16:A surprising theorem of propositional logic.
$(p \Rightarrow q)$ or $(q \Rightarrow p)$ fof(pel$_{16}$, conjecture)

SYN416^4.p Pelletier Problem 16
include('Axioms/LCL010^0.ax')
p: \$i → \$o thf(p_type, type)
q: \$i → \$o thf(q_type, type)
ivalid@(ior@(iimplies@(iatom@p)@(iatom@q))@(iimplies@(iatom@q)@(iatom@p))) thf(pel$_{16}$, conjecture)

SYN416^7.p Pelletier Problem 16
include('Axioms/LCL015^0.ax')
include('Axioms/LCL013^5.ax')
include('Axioms/LCL015^1.ax')
q: \$i → \$o thf(q_type, type)
p: \$i → \$o thf(p_type, type)
mvalid@(mor@(mbox_s4@(mimplies@(mbox_s4@p)@(mbox_s4@q)))@(mbox_s4@(mimplies@(mbox_s4@q)@(mbox_s4@p))))

SYN417+1.p Harrison's cute problem
$\exists x\colon (x = f(g(x)) \text{ and } \forall y\colon (y = f(g(y)) \Rightarrow x = y)) \iff \exists x\colon (x = g(f(x)) \text{ and } \forall y\colon (y = g(f(y)) \Rightarrow x = y))$ fof(cute, conjecture)

SYN548+1.p dia box (box (p or box q)≤>box p or box q)
$\forall x\colon \text{reachable}(x,x)$ fof(reflexivity_of_reachable, axiom)
$\forall x,y,z\colon ((\text{reachable}(x,y) \text{ and } \text{reachable}(y,z)) \Rightarrow \text{reachable}(x,z))$ fof(transitivity_of_reachable, axiom)
$\exists x\colon (\text{reachable}(\text{initial\_world},x) \text{ and } \forall y\colon (\text{reachable}(x,y) \Rightarrow (\forall z\colon (\text{reachable}(y,z) \Rightarrow (p(z) \text{ or } \forall v\colon (\text{reachable}(z,v) \Rightarrow q(v))))) \iff (\forall w\colon (\text{reachable}(y,w) \Rightarrow p(w)) \text{ or } \forall w\colon (\text{reachable}(y,w) \Rightarrow q(w))))))$ fof(prove_this, conjecture)

SYN549+1.p dia box(dia(p or dia q) <=> (dia p or dia q))
$\forall x\colon \text{reachable}(x,x)$ fof(reflexivity_of_reachable, axiom)
$\forall x,y,z\colon ((\text{reachable}(x,y) \text{ and } \text{reachable}(y,z)) \Rightarrow \text{reachable}(x,z))$ fof(transitivity_of_reachable, axiom)
$\exists x\colon (\text{reachable}(\text{initial\_world},x) \text{ and } \forall y\colon (\text{reachable}(x,y) \Rightarrow (\exists z\colon (\text{reachable}(y,z) \text{ and } (p(z) \text{ or } \exists v\colon (\text{reachable}(z,v) \text{ and } q(v))))) (\exists w\colon (\text{reachable}(y,w) \text{ and } p(w)) \text{ or } \exists w\colon (\text{reachable}(y,w) \text{ and } q(w))))))$ fof(prove_this, conjecture)

SYN550+1.p dia box p <=> dia box dia box p
$\forall x\colon \text{reachable}(x,x)$ fof(reflexivity_of_reachable, axiom)
$\forall x,y,z\colon ((\text{reachable}(x,y) \text{ and } \text{reachable}(y,z)) \Rightarrow \text{reachable}(x,z))$ fof(transitivity_of_reachable, axiom)
$\exists x\colon (\text{reachable}(\text{initial\_world},x) \text{ and } \forall y\colon (\text{reachable}(x,y) \Rightarrow p(y))) \iff \exists x\colon (\text{reachable}(\text{initial\_world},x) \text{ and } \forall y\colon (\text{reachable}(x$
$\exists z\colon (\text{reachable}(y,z) \text{ and } \forall w\colon (\text{reachable}(z,w) \Rightarrow p(w)))))$ fof(prove_this, conjecture)

SYN551+1.p Cute Little Problem
$(\exists x\colon x = f(g(x)) \text{ and } \forall y,z\colon ((y = f(g(y)) \text{ and } z = f(g(z))) \Rightarrow y = z)) \iff (\exists x\colon x = g(f(x)) \text{ and } \forall y,z\colon ((y = g(f(y)) \text{ and } z = g(f(z))) \Rightarrow y = z))$ fof(prove_this_cute_thing, conjecture)

SYN551+2.p Cute Little Problem
$\exists x\colon \forall y\colon (y = f(g(y)) \iff x = y) \iff \exists x\colon \forall y\colon (y = g(f(y)) \iff x = y)$ fof(prove_this_cute_thing, conjecture)

SYN551+3.p Cute Little Problem
$\exists x\colon (x = f(g(x)) \text{ and } \forall y\colon (y = f(g(y)) \Rightarrow y = x)) \iff \exists x\colon (x = g(f(x)) \text{ and } \forall y\colon (y = g(f(y)) \Rightarrow y = x))$ fof(prove_this_cute_thing, conjecture)

SYN552-1.p The E Killer
$g(x_1) = g(x_2)$ cnf(c_1, axiom)
$f(g(b),b) \neq f(g(a),a)$ cnf(c_2, axiom)

SYN553-1.p Harrison problem 1630
$p_2(x_0,x_0)$ cnf(p2$_1$, negated_conjecture)

$p_2(c_3, c_4)$ cnf(p2$_2$, negated_conjecture)
$\neg\, p_2(c_4, f_5(f_6(c_7)))$ cnf(not_p2$_3$, negated_conjecture)
$\neg\, p_2(c_3, f_5(f_6(c_7)))$ cnf(not_p2$_4$, negated_conjecture)
$p_2(f_8(x_{11}, x_{12}), f_8(x_{12}, x_{11}))$ cnf(p2$_5$, negated_conjecture)
$(p_2(x_1, x_3)$ and $p_2(x_3, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_6$, negated_conjecture)
$p_2(f_8(x_8, f_8(x_9, x_{10})), f_8(f_8(x_8, x_9), x_{10}))$ cnf(p2$_7$, negated_conjecture)
$(p_2(x_4, x_6)$ and $p_2(x_5, x_7)) \Rightarrow p_2(f_8(x_4, x_5), f_8(x_6, x_7))$ cnf(p2$_8$, negated_conjecture)
$\neg\, p_2(f_8(f_8(f_9(c_4), c_4), f_9(c_3)), f_8(f_9(c_4), f_8(f_9(c_3), c_4)))$ cnf(not_p2$_9$, negated_conjecture)

SYN554-1.p Harrison problem 1667
$p_2(x_2, x_2)$ cnf(p2$_1$, negated_conjecture)
$\neg\, p_4(x_{15}, x_{15})$ cnf(not_p4$_2$, negated_conjecture)
$\neg\, p_2(c_6, c_7)$ cnf(not_p2$_3$, negated_conjecture)
$p_2(f_3(c_5, c_6), f_3(c_5, c_7))$ cnf(p2$_4$, negated_conjecture)
$p_2(x_0, x_1)$ or $p_4(x_0, x_1)$ or $p_4(x_1, x_0)$ cnf(p2$_5$, negated_conjecture)
$(p_2(x_2, x_4)$ and $p_2(x_2, x_3)) \Rightarrow p_2(x_3, x_4)$ cnf(p2$_6$, negated_conjecture)
$p_4(x_{13}, x_{14}) \Rightarrow p_4(f_3(c_5, x_{13}), f_3(c_5, x_{14}))$ cnf(p4$_7$, negated_conjecture)
$(p_2(x_{12}, x_{10})$ and $p_4(x_{11}, x_{12})$ and $p_2(x_{11}, x_9)) \Rightarrow p_4(x_9, x_{10})$ cnf(p4$_8$, negated_conjecture)
$(p_2(x_5, x_7)$ and $p_2(x_6, x_8)) \Rightarrow p_2(f_3(x_5, x_6), f_3(x_7, x_8))$ cnf(p2$_9$, negated_conjecture)

SYN555-1.p Harrison problem 2162
$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$p_4(x_{12}, x_{12})$ cnf(p4$_2$, negated_conjecture)
$p_3(x_3, x_3)$ cnf(p3$_3$, negated_conjecture)
$p_4(f_5(c_7, c_{10}, c_9), c_9)$ cnf(p4$_4$, negated_conjecture)
$\neg\, p_4(f_5(c_7, c_{10}, c_8), c_8)$ cnf(not_p4$_5$, negated_conjecture)
$p_4(f_5(c_7, x_{24}, c_8), f_5(c_7, x_{24}, c_9))$ cnf(p4$_6$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_7$, negated_conjecture)
$(p_4(x_{12}, x_{13})$ and $p_4(x_{12}, x_{14})) \Rightarrow p_4(x_{13}, x_{14})$ cnf(p4$_8$, negated_conjecture)
$(p_3(x_3, x_4)$ and $p_3(x_3, x_5)) \Rightarrow p_3(x_4, x_5)$ cnf(p3$_9$, negated_conjecture)
$(p_4(x_8, x_{11})$ and $p_4(x_7, x_{10})$ and $p_3(x_6, x_9)) \Rightarrow p_3(f_6(x_6, x_7, x_8), f_6(x_9, x_{10}, x_{11}))$ cnf(p3$_{10}$, negated_conjecture)
$(p_3(x_{16}, x_{19})$ and $p_4(x_{17}, x_{20})$ and $p_2(x_{15}, x_{18})) \Rightarrow p_4(f_5(x_{15}, x_{16}, x_{17}), f_5(x_{18}, x_{19}, x_{20}))$ cnf(p4$_{11}$, negated_conjecture)
$(p_4(f_5(c_7, x_{21}, x_{23}), x_{23})$ and $p_4(f_5(c_7, f_6(x_{21}, x_{23}, x_{22}), x_{23}), f_5(c_7, f_6(x_{21}, x_{23}, x_{22}), x_{22}))) \Rightarrow p_4(f_5(c_7, x_{21}, x_{22}), x_{22})$ cnf(

SYN556-1.p Harrison problem 2167
$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$p_3(x_{15}, x_{15})$ cnf(p3$_2$, negated_conjecture)
$p_2(c_{10}, c_{13})$ cnf(p2$_3$, negated_conjecture)
$p_2(x_9, x_{10}) \Rightarrow p_2(f_7(x_9), f_7(x_{10}))$ cnf(p2$_4$, negated_conjecture)
$p_2(x_7, x_8) \Rightarrow p_2(f_6(x_7), f_6(x_8))$ cnf(p2$_5$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_6$, negated_conjecture)
$(p_3(x_{15}, x_{16})$ and $p_3(x_{15}, x_{17})) \Rightarrow p_3(x_{16}, x_{17})$ cnf(p3$_7$, negated_conjecture)
$p_3(c_9, f_4(c_{13}, f_5(f_8(c_{11}, c_{13}), f_6(f_7(c_{12}))), c_{11}))$ cnf(p3$_8$, negated_conjecture)
$\neg\, p_3(c_9, f_4(c_{10}, f_5(f_8(c_{11}, c_{10}), f_6(f_7(c_{12}))), c_{11}))$ cnf(not_p3$_9$, negated_conjecture)
$(p_2(x_3, x_5)$ and $p_2(x_4, x_6)) \Rightarrow p_2(f_5(x_3, x_4), f_5(x_5, x_6))$ cnf(p2$_{10}$, negated_conjecture)
$(p_2(x_{12}, x_{14})$ and $p_3(x_{11}, x_{13})) \Rightarrow p_2(f_8(x_{11}, x_{12}), f_8(x_{13}, x_{14}))$ cnf(p2$_{11}$, negated_conjecture)
$(p_2(x_{19}, x_{22})$ and $p_3(x_{20}, x_{23})$ and $p_2(x_{18}, x_{21})) \Rightarrow p_3(f_4(x_{18}, x_{19}, x_{20}), f_4(x_{21}, x_{22}, x_{23}))$ cnf(p3$_{12}$, negated_conjecture)

SYN557-1.p Harrison problem 2313
$p_2(x_3, x_3)$ cnf(p2$_1$, negated_conjecture)
$p_4(x_{19}, x_{19})$ cnf(p4$_2$, negated_conjecture)
$\neg\, p_2(c_6, f_3(c_8, f_5(c_9)))$ cnf(not_p2$_3$, negated_conjecture)
$p_2(f_3(x_{10}, x_{11}), f_3(x_{11}, x_{10}))$ cnf(p2$_4$, negated_conjecture)
$p_4(x_{15}, x_{16}) \Rightarrow p_2(f_5(x_{15}), f_5(x_{16}))$ cnf(p2$_5$, negated_conjecture)
$(p_2(x_3, x_4)$ and $p_2(x_3, x_5)) \Rightarrow p_2(x_4, x_5)$ cnf(p2$_6$, negated_conjecture)
$(p_4(x_{19}, x_{17})$ and $p_4(x_{19}, x_{18})) \Rightarrow p_4(x_{17}, x_{18})$ cnf(p4$_7$, negated_conjecture)
$p_2(f_3(x_0, x_2), f_3(x_1, x_2)) \Rightarrow p_2(x_0, x_1)$ cnf(p2$_8$, negated_conjecture)
$p_2(x_0, x_1) \Rightarrow p_2(f_3(x_0, x_2), f_3(x_1, x_2))$ cnf(p2$_9$, negated_conjecture)
$p_2(f_3(x_{12}, f_3(x_{13}, x_{14})), f_3(x_{13}, f_3(x_{12}, x_{14})))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(f_3(f_3(x_{12}, x_{13}), x_{14}), f_3(x_{12}, f_3(x_{13}, x_{14})))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(f_3(c_6, f_5(c_7)), f_3(c_8, f_3(f_5(c_7), f_5(c_9))))$ cnf(p2$_{12}$, negated_conjecture)

$(p_2(x_6, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_2(f_3(x_6, x_7), f_3(x_8, x_9))$ cnf(p2$_{13}$, negated_conjecture)

SYN558-1.p Harrison problem 2379
$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$p_4(x_8, x_8)$ cnf(p4$_2$, negated_conjecture)
$p_6(c_7, f_3(x_{21}))$ cnf(p6$_3$, negated_conjecture)
$p_5(c_7, c_{10}, c_9)$ cnf(p5$_4$, negated_conjecture)
$p_5(c_7, c_{10}, c_8)$ cnf(p5$_5$, negated_conjecture)
$p_5(c_7, x_{21}, f_3(x_{21}))$ cnf(p5$_6$, negated_conjecture)
$p_2(x_6, x_7) \Rightarrow p_2(f_3(x_6), f_3(x_7))$ cnf(p2$_7$, negated_conjecture)
$p_5(c_7, c_8, x_{26}) \Rightarrow \neg p_5(c_7, c_9, x_{26})$ cnf(not_p5$_8$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_9$, negated_conjecture)
$(p_4(x_8, x_9)$ and $p_4(x_8, x_{10})) \Rightarrow p_4(x_9, x_{10})$ cnf(p4$_{10}$, negated_conjecture)
$(p_5(x_{11}, x_{12}, x_{14})$ and $p_5(x_{11}, x_{14}, x_{13})) \Rightarrow p_5(x_{11}, x_{12}, x_{13})$ cnf(p5$_{11}$, negated_conjecture)
$(p_4(x_{25}, x_{22})$ and $p_6(x_{25}, x_{24})$ and $p_2(x_{24}, x_{23})) \Rightarrow p_6(x_{22}, x_{23})$ cnf(p6$_{12}$, negated_conjecture)
$(p_6(c_7, x_4)$ and $p_6(c_7, x_3)$ and $p_5(c_7, x_5, x_4)$ and $p_5(c_7, x_5, x_3)) \Rightarrow p_2(x_3, x_4)$ cnf(p2$_{13}$, negated_conjecture)
$(p_2(x_{18}, x_{16})$ and $p_2(x_{19}, x_{17})$ and $p_4(x_{20}, x_{15})$ and $p_5(x_{20}, x_{18}, x_{19})) \Rightarrow p_5(x_{15}, x_{16}, x_{17})$ cnf(p5$_{14}$, negated_conjecture)

SYN559-1.p Harrison problem 2418
$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$p_8(c_{13}, c_9)$ cnf(p8$_2$, negated_conjecture)
$p_7(c_{10}, c_{13})$ cnf(p7$_3$, negated_conjecture)
$p_2(f_6(c_9, c_{13}), c_{14})$ cnf(p2$_4$, negated_conjecture)
$p_2(f_5(c_{14}, c_{10}), c_{15})$ cnf(p2$_5$, negated_conjecture)
$p_2(f_3(f_4(c_{11}), c_{12}), c_{15})$ cnf(p2$_6$, negated_conjecture)
$p_2(x_7, x_8) \Rightarrow p_2(f_4(x_7), f_4(x_8))$ cnf(p2$_7$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_8$, negated_conjecture)
$(p_2(x_{24}, x_{22})$ and $p_8(x_{23}, x_{24})$ and $p_2(x_{23}, x_{21})) \Rightarrow p_8(x_{21}, x_{22})$ cnf(p8$_9$, negated_conjecture)
$(p_2(x_{20}, x_{18})$ and $p_7(x_{19}, x_{20})$ and $p_2(x_{19}, x_{17})) \Rightarrow p_7(x_{17}, x_{18})$ cnf(p7$_{10}$, negated_conjecture)
$(p_2(x_3, x_5)$ and $p_2(x_4, x_6)) \Rightarrow p_2(f_3(x_3, x_4), f_3(x_5, x_6))$ cnf(p2$_{11}$, negated_conjecture)
$(p_2(x_{13}, x_{15})$ and $p_2(x_{14}, x_{16})) \Rightarrow p_2(f_6(x_{13}, x_{14}), f_6(x_{15}, x_{16}))$ cnf(p2$_{12}$, negated_conjecture)
$(p_2(x_9, x_{11})$ and $p_2(x_{10}, x_{12})) \Rightarrow p_2(f_5(x_9, x_{10}), f_5(x_{11}, x_{12}))$ cnf(p2$_{13}$, negated_conjecture)
$(p_8(x_{26}, c_9)$ and $p_7(c_{10}, x_{26})$ and $p_2(f_6(c_9, x_{26}), x_{25})) \Rightarrow \neg p_2(f_5(x_{25}, c_{10}), f_3(f_4(c_{11}), c_{12}))$ cnf(not_p8$_{14}$, negated_conjectu

SYN560-1.p Harrison problem 2529
$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$\neg p_2(c_9, f_3(c_{10}))$ cnf(not_p2$_2$, negated_conjecture)
$p_2(c_{11}, f_4(f_5(c_{12}, c_{13})))$ cnf(p2$_3$, negated_conjecture)
$p_2(f_4(x_9), f_5(x_9, f_3(f_7(c_{10}))))$ cnf(p2$_4$, negated_conjecture)
$p_2(x_{18}, x_{19}) \Rightarrow p_2(f_7(x_{18}), f_7(x_{19}))$ cnf(p2$_5$, negated_conjecture)
$p_2(x_5, x_6) \Rightarrow p_2(f_3(x_5), f_3(x_6))$ cnf(p2$_6$, negated_conjecture)
$p_2(x_7, x_8) \Rightarrow p_2(f_4(x_7), f_4(x_8))$ cnf(p2$_7$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_8$, negated_conjecture)
$(p_8(x_{24}, x_{26})$ and $p_8(x_{26}, x_{25})) \Rightarrow p_8(x_{24}, x_{25})$ cnf(p8$_9$, negated_conjecture)
$p_8(f_6(c_9, f_4(c_{12})), f_6(c_9, f_4(f_5(c_{12}, c_{14}))))$ cnf(p8$_{10}$, negated_conjecture)
$\neg p_8(f_6(c_9, f_4(c_{12})), f_6(c_9, f_4(f_4(f_5(c_{12}, c_{14})))))$ cnf(not_p8$_{11}$, negated_conjecture)
$(p_2(x_{23}, x_{21})$ and $p_8(x_{22}, x_{23})$ and $p_2(x_{22}, x_{20})) \Rightarrow p_8(x_{20}, x_{21})$ cnf(p8$_{12}$, negated_conjecture)
$(p_2(x_{10}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(f_5(x_{10}, x_{11}), f_5(x_{12}, x_{13}))$ cnf(p2$_{13}$, negated_conjecture)
$(p_2(x_{15}, x_{17})$ and $p_2(x_{14}, x_{16})) \Rightarrow p_2(f_6(x_{14}, x_{15}), f_6(x_{16}, x_{17}))$ cnf(p2$_{14}$, negated_conjecture)
$p_2(x_3, f_3(c_{10}))$ or $p_8(f_6(x_3, x_4), f_6(x_3, f_5(x_4, f_3(f_7(c_{10})))))$ cnf(p2$_{15}$, negated_conjecture)

SYN561-1.p Harrison problem 2539
$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$p_9(c_{14}, c_{10})$ cnf(p9$_2$, negated_conjecture)
$p_8(c_{11}, c_{14})$ cnf(p8$_3$, negated_conjecture)
$p_2(f_7(c_{10}, c_{14}), c_{15})$ cnf(p2$_4$, negated_conjecture)
$p_2(f_6(c_{15}, c_{11}), c_{16})$ cnf(p2$_5$, negated_conjecture)
$p_2(f_3(f_4(f_5(c_{12})), c_{13}), c_{16})$ cnf(p2$_6$, negated_conjecture)
$p_2(x_9, x_{10}) \Rightarrow p_2(f_5(x_9), f_5(x_{10}))$ cnf(p2$_7$, negated_conjecture)
$p_2(x_7, x_8) \Rightarrow p_2(f_4(x_7), f_4(x_8))$ cnf(p2$_8$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_9$, negated_conjecture)

$(p_2(x_{26}, x_{24})$ and $p_9(x_{25}, x_{26})$ and $p_2(x_{25}, x_{23})) \Rightarrow p_9(x_{23}, x_{24})$ cnf(p9$_{10}$, negated_conjecture)
$(p_2(x_{22}, x_{20})$ and $p_8(x_{21}, x_{22})$ and $p_2(x_{21}, x_{19})) \Rightarrow p_8(x_{19}, x_{20})$ cnf(p8$_{11}$, negated_conjecture)
$(p_2(x_3, x_5)$ and $p_2(x_4, x_6)) \Rightarrow p_2(f_3(x_3, x_4), f_3(x_5, x_6))$ cnf(p2$_{12}$, negated_conjecture)
$(p_2(x_{15}, x_{17})$ and $p_2(x_{16}, x_{18})) \Rightarrow p_2(f_7(x_{15}, x_{16}), f_7(x_{17}, x_{18}))$ cnf(p2$_{13}$, negated_conjecture)
$(p_2(x_{12}, x_{14})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(f_6(x_{11}, x_{12}), f_6(x_{13}, x_{14}))$ cnf(p2$_{14}$, negated_conjecture)
$(p_9(x_{28}, c_{10})$ and $p_8(c_{11}, x_{28})$ and $p_2(f_7(c_{10}, x_{28}), x_{27})) \Rightarrow \neg p_2(f_6(x_{27}, c_{11}), f_3(f_4(f_5(c_{12})), c_{13}))$ cnf(not_p9$_{15}$, negated_co

SYN562-1.p Harrison problem 2559
$p_2(x_4, x_4)$ cnf(p2$_1$, negated_conjecture)
$p_6(x_{19}, x_{19})$ cnf(p6$_2$, negated_conjecture)
$\neg p_{10}(x_{22}, x_{22})$ cnf(not_p10$_3$, negated_conjecture)
$p_2(f_9(c_{11}), f_3(c_{12}))$ cnf(p2$_4$, negated_conjecture)
$p_2(f_8(c_{11}), f_3(c_{12}))$ cnf(p2$_5$, negated_conjecture)
$p_2(x_7, x_8) \Rightarrow p_2(f_3(x_7), f_3(x_8))$ cnf(p2$_6$, negated_conjecture)
$p_6(x_{17}, x_{18}) \Rightarrow p_2(f_9(x_{17}), f_9(x_{18}))$ cnf(p2$_7$, negated_conjecture)
$p_6(x_{15}, x_{16}) \Rightarrow p_2(f_8(x_{15}), f_8(x_{16}))$ cnf(p2$_8$, negated_conjecture)
$p_6(x_{13}, x_{14}) \Rightarrow p_2(f_7(x_{13}), f_7(x_{14}))$ cnf(p2$_9$, negated_conjecture)
$p_2(x_{11}, x_{12}) \Rightarrow p_2(f_5(x_{11}), f_5(x_{12}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_9, x_{10}) \Rightarrow p_2(f_4(x_9), f_4(x_{10}))$ cnf(p2$_{11}$, negated_conjecture)
$(p_2(x_4, x_5)$ and $p_2(x_4, x_6)) \Rightarrow p_2(x_5, x_6)$ cnf(p2$_{12}$, negated_conjecture)
$(p_6(x_{19}, x_{20})$ and $p_6(x_{19}, x_{21})) \Rightarrow p_6(x_{20}, x_{21})$ cnf(p6$_{13}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{10}(x_2, x_3)) \Rightarrow p_{10}(x_0, x_1)$ cnf(p10$_{14}$, negated_conjecture)
$p_2(f_7(c_{11}), f_3(f_4(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(c_{12}))))))))))))))))$ cnf(p2$_{15}$, negated_conjecture)
$p_{10}(f_7(c_{11}), f_3(f_4(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(f_5(c_{12}))))))))))))))))$ cnf(p10$_{16}$, negated_conjecture)

SYN563-1.p Harrison problem 2755
$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$p_6(x_{22}, x_{22})$ cnf(p6$_2$, negated_conjecture)
$\neg p_6(f_4(c_7), c_8)$ cnf(not_p6$_3$, negated_conjecture)
$p_2(f_4(c_7), f_4(c_8))$ cnf(p2$_4$, negated_conjecture)
$\neg p_6(f_4(c_7), f_3(f_4(c_8)))$ cnf(not_p6$_5$, negated_conjecture)
$p_5(x_{20}, x_{21}) \Rightarrow p_6(x_{20}, x_{21})$ cnf(p6$_6$, negated_conjecture)
$p_5(f_3(f_3(x_{16})), f_3(f_4(x_{16})))$ cnf(p5$_7$, negated_conjecture)
$p_6(f_4(x_{10}), x_{11}) \Rightarrow p_5(x_{10}, x_{11})$ cnf(p5$_8$, negated_conjecture)
$p_6(c_7, x_{27}) \Rightarrow p_6(c_7, f_3(x_{27}))$ cnf(p6$_9$, negated_conjecture)
$p_5(x_{10}, x_{11}) \Rightarrow p_6(f_4(x_{10}), x_{11})$ cnf(p6$_{10}$, negated_conjecture)
$p_2(x_3, x_4) \Rightarrow p_2(f_3(x_3), f_3(x_4))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_5, x_6) \Rightarrow p_2(f_4(x_5), f_4(x_6))$ cnf(p2$_{12}$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_{13}$, negated_conjecture)
$(p_6(x_{17}, x_{19})$ and $p_6(x_{19}, x_{18})) \Rightarrow p_6(x_{17}, x_{18})$ cnf(p6$_{14}$, negated_conjecture)
$(p_5(x_9, x_8)$ and $p_6(x_7, x_9)) \Rightarrow p_5(x_7, x_8)$ cnf(p5$_{15}$, negated_conjecture)
$(p_2(x_{26}, x_{23})$ and $p_6(x_{26}, x_{25})$ and $p_2(x_{25}, x_{24})) \Rightarrow p_6(x_{23}, x_{24})$ cnf(p6$_{16}$, negated_conjecture)
$(p_2(x_{15}, x_{13})$ and $p_5(x_{14}, x_{15})$ and $p_2(x_{14}, x_{12})) \Rightarrow p_5(x_{12}, x_{13})$ cnf(p5$_{17}$, negated_conjecture)

SYN564-1.p Harrison problem 2888
$p_2(x_9, x_9)$ cnf(p2$_1$, negated_conjecture)
$p_4(x_{23}, x_{23})$ cnf(p4$_2$, negated_conjecture)
$p_2(f_5(f_7(x_{18})), f_5(x_{18}))$ cnf(p2$_3$, negated_conjecture)
$p_4(f_8(x_{38}, x_{39}), f_6(x_{38}, f_7(x_{39})))$ cnf(p4$_4$, negated_conjecture)
$p_4(f_7(f_8(x_{32}, x_{33})), f_8(x_{33}, x_{32}))$ cnf(p4$_5$, negated_conjecture)
$p_4(x_{16}, x_{17}) \Rightarrow p_2(f_5(x_{16}), f_5(x_{17}))$ cnf(p2$_6$, negated_conjecture)
$p_4(x_{30}, x_{31}) \Rightarrow p_4(f_7(x_{30}), f_7(x_{31}))$ cnf(p4$_7$, negated_conjecture)
$(p_2(x_9, x_{10})$ and $p_2(x_9, x_{11})) \Rightarrow p_2(x_{10}, x_{11})$ cnf(p2$_8$, negated_conjecture)
$(p_4(x_{23}, x_{24})$ and $p_4(x_{23}, x_{25})) \Rightarrow p_4(x_{24}, x_{25})$ cnf(p4$_9$, negated_conjecture)
$p_{10}(f_5(x_7), f_3(f_5(f_6(x_7, x_8)), f_5(x_8)))$ cnf(p10$_{10}$, negated_conjecture)
$\neg p_{10}(f_9(f_5(c_{11}), f_5(c_{12})), f_5(f_8(c_{11}, c_{12})))$ cnf(not_p10$_{11}$, negated_conjecture)
$p_{10}(f_9(x_4, x_6), x_5) \Rightarrow p_{10}(x_4, f_3(x_5, x_6))$ cnf(p10$_{12}$, negated_conjecture)
$p_{10}(x_4, f_3(x_5, x_6)) \Rightarrow p_{10}(f_9(x_4, x_6), x_5)$ cnf(p10$_{13}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{10}(x_2, x_3)) \Rightarrow p_{10}(x_0, x_1)$ cnf(p10$_{14}$, negated_conjecture)
$(p_4(x_{34}, x_{36})$ and $p_4(x_{35}, x_{37})) \Rightarrow p_4(f_8(x_{34}, x_{35}), f_8(x_{36}, x_{37}))$ cnf(p4$_{15}$, negated_conjecture)
$(p_2(x_{12}, x_{14})$ and $p_2(x_{13}, x_{15})) \Rightarrow p_2(f_3(x_{12}, x_{13}), f_3(x_{14}, x_{15}))$ cnf(p2$_{16}$, negated_conjecture)

$(p_2(x_{19}, x_{21})$ and $p_2(x_{20}, x_{22})) \Rightarrow p_2(f_9(x_{19}, x_{20}), f_9(x_{21}, x_{22}))$ cnf(p2$_{17}$, negated_conjecture)
$(p_4(x_{26}, x_{28})$ and $p_4(x_{27}, x_{29})) \Rightarrow p_4(f_6(x_{26}, x_{27}), f_6(x_{28}, x_{29}))$ cnf(p4$_{18}$, negated_conjecture)

SYN565-1.p Harrison problem 2889
$p_2(x_9, x_9)$ cnf(p2$_1$, negated_conjecture)
$p_4(x_{23}, x_{23})$ cnf(p4$_2$, negated_conjecture)
$p_2(f_5(f_7(x_{18})), f_5(x_{18}))$ cnf(p2$_3$, negated_conjecture)
$p_4(f_8(x_{38}, x_{39}), f_6(x_{38}, f_7(x_{39})))$ cnf(p4$_4$, negated_conjecture)
$p_4(f_7(f_8(x_{32}, x_{33})), f_8(x_{33}, x_{32}))$ cnf(p4$_5$, negated_conjecture)
$p_4(x_{16}, x_{17}) \Rightarrow p_2(f_5(x_{16}), f_5(x_{17}))$ cnf(p2$_6$, negated_conjecture)
$p_4(x_{30}, x_{31}) \Rightarrow p_4(f_7(x_{30}), f_7(x_{31}))$ cnf(p4$_7$, negated_conjecture)
$(p_2(x_9, x_{10})$ and $p_2(x_9, x_{11})) \Rightarrow p_2(x_{10}, x_{11})$ cnf(p2$_8$, negated_conjecture)
$(p_4(x_{23}, x_{24})$ and $p_4(x_{23}, x_{25})) \Rightarrow p_4(x_{24}, x_{25})$ cnf(p4$_9$, negated_conjecture)
$p_{10}(f_5(x_7), f_3(f_5(f_6(x_7, x_8)), f_5(x_8)))$ cnf(p10$_{10}$, negated_conjecture)
$\neg p_{10}(f_9(f_5(c_{11}), f_5(c_{12})), f_5(f_8(c_{12}, c_{11})))$ cnf(not_p10$_{11}$, negated_conjecture)
$p_{10}(f_9(x_4, x_6), x_5) \Rightarrow p_{10}(x_4, f_3(x_5, x_6))$ cnf(p10$_{12}$, negated_conjecture)
$p_{10}(x_4, f_3(x_5, x_6)) \Rightarrow p_{10}(f_9(x_4, x_6), x_5)$ cnf(p10$_{13}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{10}(x_2, x_3)) \Rightarrow p_{10}(x_0, x_1)$ cnf(p10$_{14}$, negated_conjecture)
$(p_4(x_{34}, x_{36})$ and $p_4(x_{35}, x_{37})) \Rightarrow p_4(f_8(x_{34}, x_{35}), f_8(x_{36}, x_{37}))$ cnf(p4$_{15}$, negated_conjecture)
$(p_2(x_{12}, x_{14})$ and $p_2(x_{13}, x_{15})) \Rightarrow p_2(f_3(x_{12}, x_{13}), f_3(x_{14}, x_{15}))$ cnf(p2$_{16}$, negated_conjecture)
$(p_2(x_{19}, x_{21})$ and $p_2(x_{20}, x_{22})) \Rightarrow p_2(f_9(x_{19}, x_{20}), f_9(x_{21}, x_{22}))$ cnf(p2$_{17}$, negated_conjecture)
$(p_4(x_{26}, x_{28})$ and $p_4(x_{27}, x_{29})) \Rightarrow p_4(f_6(x_{26}, x_{27}), f_6(x_{28}, x_{29}))$ cnf(p4$_{18}$, negated_conjecture)

SYN566-1.p Harrison problem 2967
$p_9(x_{25}, x_{25})$ cnf(p9$_1$, negated_conjecture)
$p_2(x_4, x_4)$ cnf(p2$_2$, negated_conjecture)
$p_3(x_{11}, x_{11})$ cnf(p3$_3$, negated_conjecture)
$p_7(x_{16}, x_{16})$ cnf(p7$_4$, negated_conjecture)
$p_{10}(c_{15}, c_{11})$ cnf(p10$_5$, negated_conjecture)
$p_8(c_{12}, c_{13})$ cnf(p8$_6$, negated_conjecture)
$p_2(c_{14}, f_6(c_{15}))$ cnf(p2$_7$, negated_conjecture)
$p_3(c_{13}, f_4(c_{14}))$ cnf(p3$_8$, negated_conjecture)
$p_2(x_{14}, x_{15}) \Rightarrow p_3(f_4(x_{14}), f_4(x_{15}))$ cnf(p3$_9$, negated_conjecture)
$p_2(x_7, x_8) \Rightarrow p_2(f_5(x_7), f_5(x_8))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_9, x_{10}) \Rightarrow p_2(f_6(x_9), f_6(x_{10}))$ cnf(p2$_{11}$, negated_conjecture)
$(p_9(x_{25}, x_{26})$ and $p_9(x_{25}, x_{27})) \Rightarrow p_9(x_{26}, x_{27})$ cnf(p9$_{12}$, negated_conjecture)
$(p_2(x_4, x_5)$ and $p_2(x_4, x_6)) \Rightarrow p_2(x_5, x_6)$ cnf(p2$_{13}$, negated_conjecture)
$(p_3(x_{11}, x_{12})$ and $p_3(x_{11}, x_{13})) \Rightarrow p_3(x_{12}, x_{13})$ cnf(p3$_{14}$, negated_conjecture)
$(p_7(x_{16}, x_{17})$ and $p_7(x_{16}, x_{18})) \Rightarrow p_7(x_{17}, x_{18})$ cnf(p7$_{15}$, negated_conjecture)
$p_8(x_{19}, f_4(f_6(x_{20}))) \Rightarrow p_8(x_{19}, f_4(f_5(x_{20})))$ cnf(p8$_{16}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_9(x_3, x_1)$ and $p_{10}(x_2, x_3)) \Rightarrow p_{10}(x_0, x_1)$ cnf(p10$_{17}$, negated_conjecture)
$(p_7(x_{24}, x_{21})$ and $p_8(x_{24}, x_{23})$ and $p_3(x_{23}, x_{22})) \Rightarrow p_8(x_{21}, x_{22})$ cnf(p8$_{18}$, negated_conjecture)
$(p_{10}(x_{28}, c_{11})$ and $p_8(c_{12}, x_{30})$ and $p_3(x_{30}, f_4(x_{29}))) \Rightarrow \neg p_2(x_{29}, f_5(x_{28}))$ cnf(not_p10$_{19}$, negated_conjecture)

SYN567-1.p Harrison problem 3022
$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$p_5(x_{12}, x_{12})$ cnf(p5$_2$, negated_conjecture)
$p_5(f_8(f_6(x_{17})), x_{17})$ cnf(p5$_3$, negated_conjecture)
$\neg p_2(f_6(c_9), f_3(f_4(c_{10})))$ cnf(not_p2$_4$, negated_conjecture)
$\neg p_2(f_6(c_9), f_3(f_7(f_4(c_{10}))))$ cnf(not_p2$_5$, negated_conjecture)
$\neg p_2(f_6(c_9), f_3(f_7(f_7(f_4(c_{10})))))$ cnf(not_p2$_6$, negated_conjecture)
$p_2(x_4, x_5) \Rightarrow p_2(f_3(x_4), f_3(x_5))$ cnf(p2$_7$, negated_conjecture)
$p_2(x_{15}, x_{16}) \Rightarrow p_5(f_8(x_{15}), f_8(x_{16}))$ cnf(p5$_8$, negated_conjecture)
$p_2(x_{10}, x_{11}) \Rightarrow p_2(f_7(x_{10}), f_7(x_{11}))$ cnf(p2$_9$, negated_conjecture)
$p_5(x_8, x_9) \Rightarrow p_2(f_6(x_8), f_6(x_9))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_6, x_7) \Rightarrow p_2(f_4(x_6), f_4(x_7))$ cnf(p2$_{11}$, negated_conjecture)
$\neg p_2(f_6(c_9), f_3(f_7(f_7(f_7(f_4(c_{10}))))))$ cnf(not_p2$_{12}$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_{13}$, negated_conjecture)
$(p_5(x_{12}, x_{13})$ and $p_5(x_{12}, x_{14})) \Rightarrow p_5(x_{13}, x_{14})$ cnf(p5$_{14}$, negated_conjecture)
$p_2(x_3, f_3(f_4(c_{10}))) \Rightarrow p_2(f_6(f_8(x_3)), x_3)$ cnf(p2$_{15}$, negated_conjecture)
$p_2(x_3, f_3(f_7(f_4(c_{10})))) \Rightarrow p_2(f_6(f_8(x_3)), x_3)$ cnf(p2$_{16}$, negated_conjecture)

$p_2(x_3, f_3(f_7(f_7(f_4(c_{10})))))\ \Rightarrow\ p_2(f_6(f_8(x_3)), x_3)$ cnf(p2$_{17}$, negated_conjecture)
$p_2(x_3, f_3(f_7(f_7(f_7(f_4(c_{10}))))))\ \Rightarrow\ p_2(f_6(f_8(x_3)), x_3)$ cnf(p2$_{18}$, negated_conjecture)
$p_2(f_6(f_8(x_3)), x_3)\ \Rightarrow\ (p_2(x_3, f_3(f_4(c_{10}))))$ or $p_2(x_3, f_3(f_7(f_4(c_{10}))))$ or $p_2(x_3, f_3(f_7(f_7(f_4(c_{10})))))$ or $p_2(x_3, f_3(f_7(f_7(f_7(f_4(c_{10}$

SYN568-1.p Harrison problem 3076
$p_2(x_{17}, x_{17})$ cnf(p2$_1$, negated_conjecture)
$p_3(x_{28}, x_{28})$ cnf(p3$_2$, negated_conjecture)
$\neg\, p_{11}(f_9(c_{13}), f_9(c_{14}))$ cnf(not_p11$_3$, negated_conjecture)
$p_{11}(f_5(f_6(c_{12})), f_9(x_{16}))$ cnf(p11$_4$, negated_conjecture)
$p_{10}(x_4, x_5)$ or $p_{11}(x_5, x_4)$ cnf(p10$_5$, negated_conjecture)
$p_{10}(x_4, x_5)\ \Rightarrow\ \neg\, p_{11}(x_5, x_4)$ cnf(not_p10$_6$, negated_conjecture)
$\neg\, p_3(f_6(f_7(f_8(c_{12}))), f_6(c_{12}))$ cnf(not_p3$_7$, negated_conjecture)
$p_3(x_{35}, x_{36})\ \Rightarrow\ p_3(f_8(x_{35}), f_8(x_{36}))$ cnf(p3$_8$, negated_conjecture)
$p_3(x_{24}, x_{25})\ \Rightarrow\ p_2(f_5(x_{24}), f_5(x_{25}))$ cnf(p2$_9$, negated_conjecture)
$p_2(x_{26}, x_{27})\ \Rightarrow\ p_2(f_9(x_{26}), f_9(x_{27}))$ cnf(p2$_{10}$, negated_conjecture)
$p_3(x_{31}, x_{32})\ \Rightarrow\ p_3(f_6(x_{31}), f_6(x_{32}))$ cnf(p3$_{11}$, negated_conjecture)
$p_3(x_{33}, x_{34})\ \Rightarrow\ p_3(f_7(x_{33}), f_7(x_{34}))$ cnf(p3$_{12}$, negated_conjecture)
$(p_2(x_{17}, x_{18})$ and $p_2(x_{17}, x_{19}))\ \Rightarrow\ p_2(x_{18}, x_{19})$ cnf(p2$_{13}$, negated_conjecture)
$(p_3(x_{28}, x_{29})$ and $p_3(x_{28}, x_{30}))\ \Rightarrow\ p_3(x_{29}, x_{30})$ cnf(p3$_{14}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{10}(x_2, x_3))\ \Rightarrow\ p_{10}(x_0, x_1)$ cnf(p10$_{15}$, negated_conjecture)
$(p_2(x_{11}, x_9)$ and $p_2(x_{12}, x_{10})$ and $p_{11}(x_{11}, x_{12}))\ \Rightarrow\ p_{11}(x_9, x_{10})$ cnf(p11$_{16}$, negated_conjecture)
$(p_2(x_{20}, x_{22})$ and $p_3(x_{21}, x_{23}))\ \Rightarrow\ p_2(f_4(x_{20}, x_{21}), f_4(x_{22}, x_{23}))$ cnf(p2$_{17}$, negated_conjecture)
$p_{11}(f_4(f_9(c_{13}), f_6(f_7(f_8(c_{12})))), f_4(f_9(c_{14}), f_6(f_7(f_8(c_{12})))))$ cnf(p11$_{18}$, negated_conjecture)
$(p_{11}(x_{13}, x_{15})$ and $p_{11}(f_5(f_6(c_{12})), x_{13}))\ \Rightarrow\ p_{11}(f_4(x_{13}, x_{14}), f_4(x_{15}, x_{14}))$ cnf(p11$_{19}$, negated_conjecture)
$(p_{10}(x_6, x_8)$ and $p_{11}(f_5(f_6(c_{12})), x_6))\ \Rightarrow\ (p_3(x_7, f_6(c_{12}))$ or $p_{10}(f_4(x_6, x_7), f_4(x_8, x_7)))$ cnf(p3$_{20}$, negated_conjecture)

SYN569-1.p Harrison problem 3088
$p_2(x_6, x_6)$ cnf(p2$_1$, negated_conjecture)
$p_6(x_{27}, x_{27})$ cnf(p6$_2$, negated_conjecture)
$p_8(c_{14}, c_{12})$ cnf(p8$_3$, negated_conjecture)
$p_8(c_{11}, c_{12})$ cnf(p8$_4$, negated_conjecture)
$p_8(c_{11}, c_{14})$ cnf(p8$_5$, negated_conjecture)
$p_9(c_{13}, c_{15}, c_{14})$ cnf(p9$_6$, negated_conjecture)
$p_8(x_4, x_5)\ \Rightarrow\ p_{10}(x_4, x_5)$ cnf(p10$_7$, negated_conjecture)
$p_2(x_{13}, x_{14})\ \Rightarrow\ p_2(f_3(x_{13}), f_3(x_{14}))$ cnf(p2$_8$, negated_conjecture)
$(p_6(x_{27}, x_{28})$ and $p_6(x_{27}, x_{29}))\ \Rightarrow\ p_6(x_{28}, x_{29})$ cnf(p6$_9$, negated_conjecture)
$(p_2(x_6, x_7)$ and $p_2(x_6, x_8))\ \Rightarrow\ p_2(x_7, x_8)$ cnf(p2$_{10}$, negated_conjecture)
$(p_9(x_{11}, x_9, x_{12})$ and $p_9(x_{11}, x_{10}, x_{12}))\ \Rightarrow\ p_2(x_9, x_{10})$ cnf(p2$_{11}$, negated_conjecture)
$(p_{10}(x_{40}, c_{12})$ and $p_{10}(c_{11}, x_{40}))\ \Rightarrow\ p_9(c_{13}, f_3(x_{40}), x_{40})$ cnf(p9$_{12}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{10}(x_2, x_3))\ \Rightarrow\ p_{10}(x_0, x_1)$ cnf(p10$_{13}$, negated_conjecture)
$(p_2(x_{33}, x_{31})$ and $p_8(x_{32}, x_{33})$ and $p_2(x_{32}, x_{30}))\ \Rightarrow\ p_8(x_{30}, x_{31})$ cnf(p8$_{14}$, negated_conjecture)
$p_2(f_5(f_7(c_{13}, c_{12}), f_7(c_{13}, c_{11})), f_4(f_5(c_{12}, c_{11}), c_{15}))$ cnf(p2$_{15}$, negated_conjecture)
$(p_2(x_{15}, x_{17})$ and $p_2(x_{16}, x_{18}))\ \Rightarrow\ p_2(f_4(x_{15}, x_{16}), f_4(x_{17}, x_{18}))$ cnf(p2$_{16}$, negated_conjecture)
$(p_2(x_{24}, x_{26})$ and $p_6(x_{23}, x_{25}))\ \Rightarrow\ p_2(f_7(x_{23}, x_{24}), f_7(x_{25}, x_{26}))$ cnf(p2$_{17}$, negated_conjecture)
$(p_2(x_{19}, x_{21})$ and $p_2(x_{20}, x_{22}))\ \Rightarrow\ p_2(f_5(x_{19}, x_{20}), f_5(x_{21}, x_{22}))$ cnf(p2$_{18}$, negated_conjecture)
$(p_2(x_{37}, x_{35})$ and $p_2(x_{38}, x_{36})$ and $p_6(x_{39}, x_{34})$ and $p_9(x_{39}, x_{37}, x_{38}))\ \Rightarrow\ p_9(x_{34}, x_{35}, x_{36})$ cnf(p9$_{19}$, negated_conjecture)
$(p_8(x_{41}, c_{12})$ and $p_8(c_{11}, x_{41}))\ \Rightarrow\ \neg\, p_2(f_5(f_7(c_{13}, c_{12}), f_7(c_{13}, c_{11})), f_4(f_5(c_{12}, c_{11}), f_3(x_{41})))$ cnf(not_p8$_{20}$, negated_conjectu

SYN570-1.p Harrison problem 3089
$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_7(x_{21}, x_{21})$ cnf(p7$_2$, negated_conjecture)
$p_6(x_{18}, x_{18})$ cnf(p6$_3$, negated_conjecture)
$p_3(x_{12}, x_{12})$ cnf(p3$_4$, negated_conjecture)
$p_2(x_7, x_7)$ cnf(p2$_5$, negated_conjecture)
$p_{11}(c_{12}, c_{14})$ cnf(p11$_6$, negated_conjecture)
$p_9(c_{15}, f_8(c_{13}))$ cnf(p9$_7$, negated_conjecture)
$p_2(c_{12}, f_5(c_{15}))$ cnf(p2$_8$, negated_conjecture)
$p_3(f_4(f_5(x_{17})), x_{17})$ cnf(p3$_9$, negated_conjecture)
$\neg\, p_9(f_4(c_{12}), f_8(c_{13}))$ cnf(not_p9$_{10}$, negated_conjecture)
$p_6(x_{24}, x_{25})\ \Rightarrow\ p_7(f_8(x_{24}), f_8(x_{25}))$ cnf(p7$_{11}$, negated_conjecture)
$p_3(x_{10}, x_{11})\ \Rightarrow\ p_2(f_5(x_{10}), f_5(x_{11}))$ cnf(p2$_{12}$, negated_conjecture)

$p_2(x_{15}, x_{16}) \Rightarrow p_3(f_4(x_{15}), f_4(x_{16}))$ cnf(p3$_{13}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{14}$, negated_conjecture)
$(p_7(x_{21}, x_{22})$ and $p_7(x_{21}, x_{23})) \Rightarrow p_7(x_{22}, x_{23})$ cnf(p7$_{15}$, negated_conjecture)
$(p_6(x_{18}, x_{19})$ and $p_6(x_{18}, x_{20})) \Rightarrow p_6(x_{19}, x_{20})$ cnf(p6$_{16}$, negated_conjecture)
$(p_3(x_{12}, x_{13})$ and $p_3(x_{12}, x_{14})) \Rightarrow p_3(x_{13}, x_{14})$ cnf(p3$_{17}$, negated_conjecture)
$(p_2(x_7, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_2(x_8, x_9)$ cnf(p2$_{18}$, negated_conjecture)
$(p_7(x_{29}, x_{27})$ and $p_9(x_{28}, x_{29})$ and $p_3(x_{28}, x_{26})) \Rightarrow p_9(x_{26}, x_{27})$ cnf(p9$_{19}$, negated_conjecture)
$(p_{11}(x_6, x_5)$ and $p_2(x_6, x_3)$ and $p_{10}(x_5, x_4)) \Rightarrow p_{11}(x_3, x_4)$ cnf(p11$_{20}$, negated_conjecture)

SYN571-1.p Harrison problem 3108
$p_4(x_{26}, x_{26})$ cnf(p4$_1$, negated_conjecture)
$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)
$p_{11}(f_5(x_{10}), c_{14})$ cnf(p11$_3$, negated_conjecture)
$\neg p_{11}(c_{13}, f_5(x_{40}))$ cnf(not_p11$_4$, negated_conjecture)
$p_{11}(x_4, x_5)$ or $p_{11}(x_5, x_4)$ cnf(p11$_5$, negated_conjecture)
$\neg p_{11}(x_{39}, f_3(x_{39}, f_5(f_6(f_7(c_{12})))))$ cnf(not_p11$_6$, negated_conjecture)
$p_{11}(f_5(f_{10}(x_9)), x_9) \Rightarrow p_{11}(c_{14}, x_9)$ cnf(p11$_7$, negated_conjecture)
$p_4(x_{33}, x_{34}) \Rightarrow p_4(f_7(x_{33}), f_7(x_{34}))$ cnf(p4$_8$, negated_conjecture)
$p_4(x_{18}, x_{19}) \Rightarrow p_2(f_5(x_{18}), f_5(x_{19}))$ cnf(p2$_9$, negated_conjecture)
$p_2(x_{29}, x_{30}) \Rightarrow p_4(f_{10}(x_{29}), f_{10}(x_{30}))$ cnf(p4$_{10}$, negated_conjecture)
$p_4(x_{31}, x_{32}) \Rightarrow p_4(f_6(x_{31}), f_6(x_{32}))$ cnf(p4$_{11}$, negated_conjecture)
$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(x_{12}, x_{13})$ cnf(p2$_{12}$, negated_conjecture)
$(p_4(x_{26}, x_{27})$ and $p_4(x_{26}, x_{28})) \Rightarrow p_4(x_{27}, x_{28})$ cnf(p4$_{13}$, negated_conjecture)
$p_2(f_9(f_5(x_{24}), f_5(x_{25})), f_5(f_8(x_{24}, x_{25})))$ cnf(p2$_{14}$, negated_conjecture)
$p_{11}(f_9(x_6, x_8), x_7) \Rightarrow p_{11}(x_6, f_3(x_7, x_8))$ cnf(p11$_{15}$, negated_conjecture)
$p_{11}(x_6, f_3(x_7, x_8)) \Rightarrow p_{11}(f_9(x_6, x_8), x_7)$ cnf(p11$_{16}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{11}(x_2, x_3)) \Rightarrow p_{11}(x_0, x_1)$ cnf(p11$_{17}$, negated_conjecture)
$(p_4(x_{35}, x_{37})$ and $p_4(x_{36}, x_{38})) \Rightarrow p_4(f_8(x_{35}, x_{36}), f_8(x_{37}, x_{38}))$ cnf(p4$_{18}$, negated_conjecture)
$(p_2(x_{14}, x_{16})$ and $p_2(x_{15}, x_{17})) \Rightarrow p_2(f_3(x_{14}, x_{15}), f_3(x_{16}, x_{17}))$ cnf(p2$_{19}$, negated_conjecture)
$(p_2(x_{20}, x_{22})$ and $p_2(x_{21}, x_{23})) \Rightarrow p_2(f_9(x_{20}, x_{21}), f_9(x_{22}, x_{23}))$ cnf(p2$_{20}$, negated_conjecture)

SYN572-1.p Harrison problem 3112
$p_2(x_6, x_6)$ cnf(p2$_1$, negated_conjecture)
$p_6(x_{34}, x_{34})$ cnf(p6$_2$, negated_conjecture)
$p_4(x_{22}, x_{22})$ cnf(p4$_3$, negated_conjecture)
$p_4(f_{10}(f_9(x_{27})), f_{10}(x_{27}))$ cnf(p4$_4$, negated_conjecture)
$p_2(f_3(x_{13}, f_5(f_7(f_8(c_{13})))), x_{13})$ cnf(p2$_5$, negated_conjecture)
$p_6(x_{37}, x_{38}) \Rightarrow p_6(f_8(x_{37}), f_8(x_{38}))$ cnf(p6$_6$, negated_conjecture)
$p_4(x_{18}, x_{19}) \Rightarrow p_2(f_5(x_{18}), f_5(x_{19}))$ cnf(p2$_7$, negated_conjecture)
$p_2(x_{20}, x_{21}) \Rightarrow p_2(f_9(x_{20}), f_9(x_{21}))$ cnf(p2$_8$, negated_conjecture)
$p_2(x_{25}, x_{26}) \Rightarrow p_4(f_{10}(x_{25}), f_{10}(x_{26}))$ cnf(p4$_9$, negated_conjecture)
$p_6(x_{32}, x_{33}) \Rightarrow p_4(f_7(x_{32}), f_7(x_{33}))$ cnf(p4$_{10}$, negated_conjecture)
$p_2(f_3(x_{14}, f_9(x_{14})), f_5(f_7(f_8(c_{13}))))$ cnf(p2$_{11}$, negated_conjecture)
$(p_2(x_6, x_7)$ and $p_2(x_6, x_8)) \Rightarrow p_2(x_7, x_8)$ cnf(p2$_{12}$, negated_conjecture)
$(p_6(x_{34}, x_{35})$ and $p_6(x_{34}, x_{36})) \Rightarrow p_6(x_{35}, x_{36})$ cnf(p6$_{13}$, negated_conjecture)
$(p_4(x_{22}, x_{23})$ and $p_4(x_{22}, x_{24})) \Rightarrow p_4(x_{23}, x_{24})$ cnf(p4$_{14}$, negated_conjecture)
$p_{12}(f_{10}(f_3(x_4, x_5)), f_{11}(f_{10}(x_4), f_{10}(x_5)))$ cnf(p12$_{15}$, negated_conjecture)
$\neg p_{12}(f_{10}(c_{14}), f_{11}(f_{10}(f_3(c_{14}, c_{15})), f_{10}(c_{15})))$ cnf(not_p12$_{16}$, negated_conjecture)
$p_2(f_3(x_{15}, f_3(x_{16}, x_{17})), f_3(f_3(x_{15}, x_{16}), x_{17}))$ cnf(p2$_{17}$, negated_conjecture)
$(p_4(x_2, x_0)$ and $p_4(x_3, x_1)$ and $p_{12}(x_2, x_3)) \Rightarrow p_{12}(x_0, x_1)$ cnf(p12$_{18}$, negated_conjecture)
$(p_4(x_{28}, x_{30})$ and $p_4(x_{29}, x_{31})) \Rightarrow p_4(f_{11}(x_{28}, x_{29}), f_{11}(x_{30}, x_{31}))$ cnf(p4$_{19}$, negated_conjecture)
$(p_2(x_9, x_{11})$ and $p_2(x_{10}, x_{12})) \Rightarrow p_2(f_3(x_9, x_{10}), f_3(x_{11}, x_{12}))$ cnf(p2$_{20}$, negated_conjecture)

SYN573-1.p Harrison problem 3208
$p_{12}(c_{15})$ cnf(c15_is_p12$_1$, negated_conjecture)
$p_4(x_{30}, x_{30})$ cnf(p4$_2$, negated_conjecture)
$p_2(x_{17}, x_{17})$ cnf(p2$_3$, negated_conjecture)
$p_{12}(x_{16}) \Rightarrow p_2(x_{16}, f_9(f_{10}(x_{16})))$ cnf(p2$_4$, negated_conjecture)
$(p_{12}(x_{11})$ and $p_2(x_{11}, x_{10})) \Rightarrow p_{12}(x_{10})$ cnf(p12$_5$, negated_conjecture)
$p_4(x_{37}, x_{38}) \Rightarrow p_4(f_7(x_{37}), f_7(x_{38}))$ cnf(p4$_6$, negated_conjecture)
$p_4(x_{24}, x_{25}) \Rightarrow p_2(f_5(x_{24}), f_5(x_{25}))$ cnf(p2$_7$, negated_conjecture)

$p_2(x_{26}, x_{27}) \Rightarrow p_2(f_8(x_{26}), f_8(x_{27}))$ cnf(p2$_8$, negated_conjecture)
$p_4(x_{28}, x_{29}) \Rightarrow p_2(f_9(x_{28}), f_9(x_{29}))$ cnf(p2$_9$, negated_conjecture)
$p_2(x_{33}, x_{34}) \Rightarrow p_4(f_{10}(x_{33}), f_{10}(x_{34}))$ cnf(p4$_{10}$, negated_conjecture)
$p_4(x_{35}, x_{36}) \Rightarrow p_4(f_6(x_{35}), f_6(x_{36}))$ cnf(p4$_{11}$, negated_conjecture)
$(p_4(x_{30}, x_{31})$ and $p_4(x_{30}, x_{32})) \Rightarrow p_4(x_{31}, x_{32})$ cnf(p4$_{12}$, negated_conjecture)
$(p_2(x_{17}, x_{18})$ and $p_2(x_{17}, x_{19})) \Rightarrow p_2(x_{18}, x_{19})$ cnf(p2$_{13}$, negated_conjecture)
$p_{12}(x_9) \Rightarrow (p_{11}(x_9, c_{16})$ or $p_2(x_9, f_9(c_{17})))$ cnf(p11$_{14}$, negated_conjecture)
$p_{12}(x_{16}) \Rightarrow (p_{13}(f_{10}(x_{16}), c_{17})$ or $p_4(f_{10}(x_{16}), c_{17}))$ cnf(p13$_{15}$, negated_conjecture)
$p_{11}(x_7, f_3(f_8(x_8), f_3(f_8(x_7), f_5(f_6(f_7(c_{14}))))))$ cnf(p11$_{16}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{11}(x_2, x_3)) \Rightarrow p_{11}(x_0, x_1)$ cnf(p11$_{17}$, negated_conjecture)
$(p_4(x_{14}, x_{12})$ and $p_4(x_{15}, x_{13})$ and $p_{13}(x_{14}, x_{15})) \Rightarrow p_{13}(x_{12}, x_{13})$ cnf(p13$_{18}$, negated_conjecture)
$\neg p_{11}(c_{15}, f_3(f_8(c_{16}), f_3(f_8(f_9(c_{17})), f_5(f_6(f_7(c_{14}))))))$ cnf(not_p11$_{19}$, negated_conjecture)
$(p_2(x_{20}, x_{22})$ and $p_2(x_{21}, x_{23})) \Rightarrow p_2(f_3(x_{20}, x_{21}), f_3(x_{22}, x_{23}))$ cnf(p2$_{20}$, negated_conjecture)
$p_{11}(x_4, x_5) \Rightarrow p_{11}(x_4, f_3(f_8(x_5), f_3(f_8(x_6), f_5(f_6(f_7(c_{14}))))))$ cnf(p11$_{21}$, negated_conjecture)

SYN574-1.p Harrison problem 3263
$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_7(x_{21}, x_{21})$ cnf(p7$_2$, negated_conjecture)
$p_3(x_{12}, x_{12})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_7, x_7)$ cnf(p2$_4$, negated_conjecture)
$p_9(c_{12}, c_{13})$ cnf(p9$_5$, negated_conjecture)
$p_{11}(c_{14}, c_{15})$ cnf(p11$_6$, negated_conjecture)
$p_3(f_4(f_5(x_{17})), f_4(x_{17}))$ cnf(p3$_7$, negated_conjecture)
$p_3(f_6(f_5(x_{20})), f_6(x_{20}))$ cnf(p3$_8$, negated_conjecture)
$p_9(x_{32}, f_4(c_{14})) \Rightarrow p_9(x_{32}, c_{13})$ cnf(p9$_9$, negated_conjecture)
$p_9(x_{32}, c_{13}) \Rightarrow p_9(x_{32}, f_4(c_{14}))$ cnf(p9$_{10}$, negated_conjecture)
$p_2(x_{10}, x_{11}) \Rightarrow p_2(f_5(x_{10}), f_5(x_{11}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{18}, x_{19}) \Rightarrow p_3(f_6(x_{18}), f_6(x_{19}))$ cnf(p3$_{12}$, negated_conjecture)
$p_2(x_{15}, x_{16}) \Rightarrow p_3(f_4(x_{15}), f_4(x_{16}))$ cnf(p3$_{13}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{14}$, negated_conjecture)
$(p_7(x_{21}, x_{22})$ and $p_7(x_{21}, x_{23})) \Rightarrow p_7(x_{22}, x_{23})$ cnf(p7$_{15}$, negated_conjecture)
$(p_3(x_{12}, x_{13})$ and $p_3(x_{12}, x_{14})) \Rightarrow p_3(x_{13}, x_{14})$ cnf(p3$_{16}$, negated_conjecture)
$(p_2(x_7, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_2(x_8, x_9)$ cnf(p2$_{17}$, negated_conjecture)
$(p_{11}(x_6, x_5)$ and $p_2(x_6, x_3)$ and $p_{10}(x_5, x_4)) \Rightarrow p_{11}(x_3, x_4)$ cnf(p11$_{18}$, negated_conjecture)
$(p_7(x_{31}, x_{28})$ and $p_9(x_{31}, x_{30})$ and $p_3(x_{30}, x_{29})) \Rightarrow p_9(x_{28}, x_{29})$ cnf(p9$_{19}$, negated_conjecture)
$(p_2(x_{25}, x_{27})$ and $p_3(x_{24}, x_{26})) \Rightarrow p_7(f_8(x_{24}, x_{25}), f_8(x_{26}, x_{27}))$ cnf(p7$_{20}$, negated_conjecture)
$(p_{11}(x_{35}, c_{15})$ and $p_9(c_{12}, x_{33})$ and $p_2(x_{34}, f_5(x_{35}))) \Rightarrow (p_9(f_8(x_{33}, x_{34}), x_{33})$ or $p_9(f_8(x_{33}, x_{34}), f_4(x_{34})))$ cnf(p9$_{21}$, negate
$(p_{11}(x_{35}, c_{15})$ and $p_9(c_{12}, x_{33})$ and $p_2(x_{34}, f_5(x_{35}))$ and $p_9(f_8(x_{33}, x_{34}), x_{33})) \Rightarrow \neg p_9(f_8(x_{33}, x_{34}), f_4(x_{34}))$ cnf(not_p11$_{22}$,

SYN575-1.p Harrison problem 3265
$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_7(x_{21}, x_{21})$ cnf(p7$_2$, negated_conjecture)
$p_3(x_{12}, x_{12})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_7, x_7)$ cnf(p2$_4$, negated_conjecture)
$p_9(c_{12}, c_{13})$ cnf(p9$_5$, negated_conjecture)
$p_{11}(c_{14}, c_{15})$ cnf(p11$_6$, negated_conjecture)
$p_3(f_4(f_5(x_{17})), f_4(x_{17}))$ cnf(p3$_7$, negated_conjecture)
$p_3(f_6(f_5(x_{20})), f_6(x_{20}))$ cnf(p3$_8$, negated_conjecture)
$p_9(x_{32}, f_6(c_{14})) \Rightarrow p_9(x_{32}, c_{13})$ cnf(p9$_9$, negated_conjecture)
$p_9(x_{32}, c_{13}) \Rightarrow p_9(x_{32}, f_6(c_{14}))$ cnf(p9$_{10}$, negated_conjecture)
$p_2(x_{10}, x_{11}) \Rightarrow p_2(f_5(x_{10}), f_5(x_{11}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{18}, x_{19}) \Rightarrow p_3(f_6(x_{18}), f_6(x_{19}))$ cnf(p3$_{12}$, negated_conjecture)
$p_2(x_{15}, x_{16}) \Rightarrow p_3(f_4(x_{15}), f_4(x_{16}))$ cnf(p3$_{13}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{14}$, negated_conjecture)
$(p_7(x_{21}, x_{22})$ and $p_7(x_{21}, x_{23})) \Rightarrow p_7(x_{22}, x_{23})$ cnf(p7$_{15}$, negated_conjecture)
$(p_3(x_{12}, x_{13})$ and $p_3(x_{12}, x_{14})) \Rightarrow p_3(x_{13}, x_{14})$ cnf(p3$_{16}$, negated_conjecture)
$(p_2(x_7, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_2(x_8, x_9)$ cnf(p2$_{17}$, negated_conjecture)
$(p_{11}(x_6, x_5)$ and $p_2(x_6, x_3)$ and $p_{10}(x_5, x_4)) \Rightarrow p_{11}(x_3, x_4)$ cnf(p11$_{18}$, negated_conjecture)
$(p_7(x_{31}, x_{28})$ and $p_9(x_{31}, x_{30})$ and $p_3(x_{30}, x_{29})) \Rightarrow p_9(x_{28}, x_{29})$ cnf(p9$_{19}$, negated_conjecture)
$(p_2(x_{25}, x_{27})$ and $p_3(x_{24}, x_{26})) \Rightarrow p_7(f_8(x_{24}, x_{25}), f_8(x_{26}, x_{27}))$ cnf(p7$_{20}$, negated_conjecture)

$(p_{11}(x_{35}, c_{15})$ and $p_9(c_{12}, x_{33})$ and $p_2(x_{34}, f_5(x_{35}))) \Rightarrow (p_9(f_8(x_{33}, x_{34}), x_{33})$ or $p_9(f_8(x_{33}, x_{34}), f_6(x_{34})))$ cnf(p9$_{21}$, negate
$(p_{11}(x_{35}, c_{15})$ and $p_9(c_{12}, x_{33})$ and $p_2(x_{34}, f_5(x_{35}))$ and $p_9(f_8(x_{33}, x_{34}), x_{33})) \Rightarrow \neg\, p_9(f_8(x_{33}, x_{34}), f_6(x_{34}))$ cnf(not_p11$_{22}$,

SYN576-1.p Harrison problem 3280

$p_8(x_{42}, x_{42})$ cnf(p8$_1$, negated_conjecture)
$p_2(x_{13}, x_{13})$ cnf(p2$_2$, negated_conjecture)
$p_4(x_{34}, x_{34})$ cnf(p4$_3$, negated_conjecture)
$p_5(x_{37}, x_{37})$ cnf(p5$_4$, negated_conjecture)
$p_{12}(c_{15}, f_6(c_{13}))$ cnf(p12$_5$, negated_conjecture)
$p_{12}(c_{16}, f_6(c_{13}))$ cnf(p12$_6$, negated_conjecture)
$p_{11}(x_4, x_5)$ or $p_{11}(x_5, x_4)$ cnf(p11$_7$, negated_conjecture)
$p_2(f_3(x_{22}, x_{23}), f_3(x_{23}, x_{22}))$ cnf(p2$_8$, negated_conjecture)
$p_4(x_{40}, x_{41}) \Rightarrow p_5(f_6(x_{40}), f_6(x_{41}))$ cnf(p5$_9$, negated_conjecture)
$p_2(x_{16}, x_{17}) \Rightarrow p_2(f_{10}(x_{16}), f_{10}(x_{17}))$ cnf(p2$_{10}$, negated_conjecture)
$(p_8(x_{42}, x_{43})$ and $p_8(x_{42}, x_{44})) \Rightarrow p_8(x_{43}, x_{44})$ cnf(p8$_{11}$, negated_conjecture)
$(p_2(x_{13}, x_{14})$ and $p_2(x_{13}, x_{15})) \Rightarrow p_2(x_{14}, x_{15})$ cnf(p2$_{12}$, negated_conjecture)
$(p_4(x_{34}, x_{35})$ and $p_4(x_{34}, x_{36})) \Rightarrow p_4(x_{35}, x_{36})$ cnf(p4$_{13}$, negated_conjecture)
$(p_5(x_{37}, x_{38})$ and $p_5(x_{37}, x_{39})) \Rightarrow p_5(x_{38}, x_{39})$ cnf(p5$_{14}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{11}(x_2, x_3)) \Rightarrow p_{11}(x_0, x_1)$ cnf(p11$_{15}$, negated_conjecture)
$(p_2(x_8, x_6)$ and $p_5(x_9, x_7)$ and $p_{12}(x_8, x_9)) \Rightarrow p_{12}(x_6, x_7)$ cnf(p12$_{16}$, negated_conjecture)
$\neg\, p_{12}(f_7(f_9(c_{13}, c_{14}, f_3(c_{15}, c_{16})), f_3(c_{15}, c_{16})), f_6(c_{13}))$ cnf(not_p12$_{17}$, negated_conjecture)
$(p_2(x_{18}, x_{20})$ and $p_2(x_{19}, x_{21})) \Rightarrow p_2(f_3(x_{18}, x_{19}), f_3(x_{20}, x_{21}))$ cnf(p2$_{18}$, negated_conjecture)
$(p_2(x_{24}, x_{26})$ and $p_2(x_{25}, x_{27})) \Rightarrow p_2(f_7(x_{24}, x_{25}), f_7(x_{26}, x_{27}))$ cnf(p2$_{19}$, negated_conjecture)
$(p_4(x_{28}, x_{31})$ and $p_8(x_{29}, x_{32})$ and $p_2(x_{30}, x_{33})) \Rightarrow p_2(f_9(x_{28}, x_{29}, x_{30}), f_9(x_{31}, x_{32}, x_{33}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_{12}(x_{12}, f_6(x_{10}))$ and $p_{12}(x_{11}, f_6(x_{10}))$ and $p_{11}(f_{10}(x_{11}), f_{10}(x_{12}))) \Rightarrow p_{12}(f_7(f_9(x_{10}, c_{14}, f_3(x_{11}, x_{12})), x_{12}), f_6(x_{10}))$ cnf(
$(p_{12}(x_{12}, f_6(x_{10}))$ and $p_{12}(x_{11}, f_6(x_{10}))$ and $p_{11}(f_{10}(x_{11}), f_{10}(x_{12}))) \Rightarrow p_{12}(f_7(f_9(x_{10}, c_{14}, f_3(x_{11}, x_{12})), f_3(x_{11}, x_{12})), f_6(x_{10}))$

SYN577-1.p Harrison problem 3300

$p_2(x_0, x_0)$ cnf(p2$_1$, negated_conjecture)
$p_8(c_{14}, c_{13})$ cnf(p8$_2$, negated_conjecture)
$p_7(c_{11}, c_{12})$ cnf(p7$_3$, negated_conjecture)
$p_7(c_{13}, c_{12})$ cnf(p7$_4$, negated_conjecture)
$p_7(c_9, c_{10})$ cnf(p7$_5$, negated_conjecture)
$p_8(c_{14}, c_{11})$ cnf(p8$_6$, negated_conjecture)
$p_2(f_3(c_{12}, c_{11}), c_{15})$ cnf(p2$_7$, negated_conjecture)
$p_2(f_4(c_{16}, c_{14}), c_{18})$ cnf(p2$_8$, negated_conjecture)
$p_2(f_4(c_{15}, c_{14}), c_{17})$ cnf(p2$_9$, negated_conjecture)
$p_2(f_3(c_{12}, c_{13}), c_{16})$ cnf(p2$_{10}$, negated_conjecture)
$p_2(f_5(f_6(c_9), c_{19}), c_{17})$ cnf(p2$_{11}$, negated_conjecture)
$p_2(f_5(f_6(c_9), c_{20}), c_{18})$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{22}, x_{23}) \Rightarrow p_2(f_6(x_{22}), f_6(x_{23}))$ cnf(p2$_{13}$, negated_conjecture)
$(p_2(x_0, x_1)$ and $p_2(x_0, x_2)) \Rightarrow p_2(x_1, x_2)$ cnf(p2$_{14}$, negated_conjecture)
$(p_2(x_{31}, x_{29})$ and $p_8(x_{30}, x_{31})$ and $p_2(x_{30}, x_{28})) \Rightarrow p_8(x_{28}, x_{29})$ cnf(p8$_{15}$, negated_conjecture)
$(p_2(x_{27}, x_{25})$ and $p_7(x_{26}, x_{27})$ and $p_2(x_{26}, x_{24})) \Rightarrow p_7(x_{24}, x_{25})$ cnf(p7$_{16}$, negated_conjecture)
$(p_2(x_{10}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(f_3(x_{10}, x_{11}), f_3(x_{12}, x_{13}))$ cnf(p2$_{17}$, negated_conjecture)
$(p_2(x_{19}, x_{21})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(f_5(x_{18}, x_{19}), f_5(x_{20}, x_{21}))$ cnf(p2$_{18}$, negated_conjecture)
$(p_2(x_{14}, x_{16})$ and $p_2(x_{15}, x_{17})) \Rightarrow p_2(f_4(x_{14}, x_{15}), f_4(x_{16}, x_{17}))$ cnf(p2$_{19}$, negated_conjecture)
$(p_7(x_{34}, c_{10})$ and $p_2(c_{15}, x_{32})$ and $p_2(c_{16}, x_{33})$ and $p_2(f_4(x_{32}, c_{14}), f_5(f_6(x_{34}), c_{19}))) \Rightarrow \neg\, p_2(f_4(x_{33}, c_{14}), f_5(f_6(x_{34}), c_{20}))$
$(p_7(x_7, c_{10})$ and $p_7(x_3, c_{12})$ and $p_7(x_4, c_{12})$ and $p_8(c_{14}, x_4)$ and $p_8(c_{14}, x_3)$ and $p_2(f_3(c_{12}, x_4), x_6)$ and $p_2(f_3(c_{12}, x_3), x_5)$ and p
$p_2(x_3, x_4)$ cnf(p2$_{21}$, negated_conjecture)
$(p_7(x_7, c_{10})$ and $p_7(x_3, c_{12})$ and $p_7(x_4, c_{12})$ and $p_8(c_{14}, x_4)$ and $p_8(c_{14}, x_3)$ and $p_2(f_3(c_{12}, x_4), x_6)$ and $p_2(f_3(c_{12}, x_3), x_5)$ and p
$p_2(x_8, x_9)$ cnf(p2$_{22}$, negated_conjecture)

SYN578-1.p Harrison problem 3328

$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_7(x_{21}, x_{21})$ cnf(p7$_2$, negated_conjecture)
$p_3(x_{12}, x_{12})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_7, x_7)$ cnf(p2$_4$, negated_conjecture)
$p_9(c_{12}, c_{13})$ cnf(p9$_5$, negated_conjecture)
$p_{11}(c_{14}, c_{15})$ cnf(p11$_6$, negated_conjecture)
$p_2(c_{16}, f_5(c_{14}))$ cnf(p2$_7$, negated_conjecture)

$p_3(f_4(f_5(x_{17})), f_4(x_{17}))$ cnf(p3$_8$, negated_conjecture)
$p_3(f_6(f_5(x_{20})), f_6(x_{20}))$ cnf(p3$_9$, negated_conjecture)
$p_9(x_{32}, f_4(c_{16})) \Rightarrow p_9(x_{32}, c_{13})$ cnf(p9$_{10}$, negated_conjecture)
$p_9(x_{32}, c_{13}) \Rightarrow p_9(x_{32}, f_4(c_{16}))$ cnf(p9$_{11}$, negated_conjecture)
$p_2(x_{10}, x_{11}) \Rightarrow p_2(f_5(x_{10}), f_5(x_{11}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{18}, x_{19}) \Rightarrow p_3(f_6(x_{18}), f_6(x_{19}))$ cnf(p3$_{13}$, negated_conjecture)
$p_2(x_{15}, x_{16}) \Rightarrow p_3(f_4(x_{15}), f_4(x_{16}))$ cnf(p3$_{14}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{15}$, negated_conjecture)
$(p_7(x_{21}, x_{22})$ and $p_7(x_{21}, x_{23})) \Rightarrow p_7(x_{22}, x_{23})$ cnf(p7$_{16}$, negated_conjecture)
$(p_3(x_{12}, x_{13})$ and $p_3(x_{12}, x_{14})) \Rightarrow p_3(x_{13}, x_{14})$ cnf(p3$_{17}$, negated_conjecture)
$(p_2(x_7, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_2(x_8, x_9)$ cnf(p2$_{18}$, negated_conjecture)
$(p_{11}(x_6, x_5)$ and $p_2(x_6, x_3)$ and $p_{10}(x_5, x_4)) \Rightarrow p_{11}(x_3, x_4)$ cnf(p11$_{19}$, negated_conjecture)
$(p_7(x_{31}, x_{28})$ and $p_9(x_{31}, x_{30})$ and $p_3(x_{30}, x_{29})) \Rightarrow p_9(x_{28}, x_{29})$ cnf(p9$_{20}$, negated_conjecture)
$(p_2(x_{25}, x_{27})$ and $p_3(x_{24}, x_{26})) \Rightarrow p_7(f_8(x_{24}, x_{25}), f_8(x_{26}, x_{27}))$ cnf(p7$_{21}$, negated_conjecture)
$(p_{11}(x_{34}, c_{15})$ and $p_9(c_{12}, x_{33})) \Rightarrow (p_9(f_8(x_{33}, x_{34}), x_{33})$ or $p_9(f_8(x_{33}, x_{34}), f_4(x_{34})))$ cnf(p9$_{22}$, negated_conjecture)
$(p_{11}(x_{34}, c_{15})$ and $p_9(c_{12}, x_{33})$ and $p_9(f_8(x_{33}, x_{34}), x_{33})) \Rightarrow \neg\, p_9(f_8(x_{33}, x_{34}), f_4(x_{34}))$ cnf(not_p11$_{23}$, negated_conjecture)

SYN579-1.p Harrison problem 3330
$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_7(x_{21}, x_{21})$ cnf(p7$_2$, negated_conjecture)
$p_3(x_{12}, x_{12})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_7, x_7)$ cnf(p2$_4$, negated_conjecture)
$p_9(c_{12}, c_{13})$ cnf(p9$_5$, negated_conjecture)
$p_{11}(c_{14}, c_{15})$ cnf(p11$_6$, negated_conjecture)
$p_2(c_{16}, f_5(c_{14}))$ cnf(p2$_7$, negated_conjecture)
$p_3(f_4(f_5(x_{17})), f_4(x_{17}))$ cnf(p3$_8$, negated_conjecture)
$p_3(f_6(f_5(x_{20})), f_6(x_{20}))$ cnf(p3$_9$, negated_conjecture)
$p_9(x_{32}, f_6(c_{16})) \Rightarrow p_9(x_{32}, c_{13})$ cnf(p9$_{10}$, negated_conjecture)
$p_9(x_{32}, c_{13}) \Rightarrow p_9(x_{32}, f_6(c_{16}))$ cnf(p9$_{11}$, negated_conjecture)
$p_2(x_{10}, x_{11}) \Rightarrow p_2(f_5(x_{10}), f_5(x_{11}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{18}, x_{19}) \Rightarrow p_3(f_6(x_{18}), f_6(x_{19}))$ cnf(p3$_{13}$, negated_conjecture)
$p_2(x_{15}, x_{16}) \Rightarrow p_3(f_4(x_{15}), f_4(x_{16}))$ cnf(p3$_{14}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{15}$, negated_conjecture)
$(p_7(x_{21}, x_{22})$ and $p_7(x_{21}, x_{23})) \Rightarrow p_7(x_{22}, x_{23})$ cnf(p7$_{16}$, negated_conjecture)
$(p_3(x_{12}, x_{13})$ and $p_3(x_{12}, x_{14})) \Rightarrow p_3(x_{13}, x_{14})$ cnf(p3$_{17}$, negated_conjecture)
$(p_2(x_7, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_2(x_8, x_9)$ cnf(p2$_{18}$, negated_conjecture)
$(p_{11}(x_6, x_5)$ and $p_2(x_6, x_3)$ and $p_{10}(x_5, x_4)) \Rightarrow p_{11}(x_3, x_4)$ cnf(p11$_{19}$, negated_conjecture)
$(p_7(x_{31}, x_{28})$ and $p_9(x_{31}, x_{30})$ and $p_3(x_{30}, x_{29})) \Rightarrow p_9(x_{28}, x_{29})$ cnf(p9$_{20}$, negated_conjecture)
$(p_2(x_{25}, x_{27})$ and $p_3(x_{24}, x_{26})) \Rightarrow p_7(f_8(x_{24}, x_{25}), f_8(x_{26}, x_{27}))$ cnf(p7$_{21}$, negated_conjecture)
$(p_{11}(x_{34}, c_{15})$ and $p_9(c_{12}, x_{33})) \Rightarrow (p_9(f_8(x_{33}, x_{34}), x_{33})$ or $p_9(f_8(x_{33}, x_{34}), f_6(x_{34})))$ cnf(p9$_{22}$, negated_conjecture)
$(p_{11}(x_{34}, c_{15})$ and $p_9(c_{12}, x_{33})$ and $p_9(f_8(x_{33}, x_{34}), x_{33})) \Rightarrow \neg\, p_9(f_8(x_{33}, x_{34}), f_6(x_{34}))$ cnf(not_p11$_{23}$, negated_conjecture)

SYN580-1.p Harrison problem 3332
$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_7(x_{19}, x_{19})$ cnf(p7$_2$, negated_conjecture)
$p_4(x_{12}, x_{12})$ cnf(p4$_3$, negated_conjecture)
$p_2(x_7, x_7)$ cnf(p2$_4$, negated_conjecture)
$p_{11}(c_{15}, c_{16})$ cnf(p11$_5$, negated_conjecture)
$p_9(c_{12}, c_{13})$ cnf(p9$_6$, negated_conjecture)
$p_2(c_{14}, f_3(c_{15}))$ cnf(p2$_7$, negated_conjecture)
$\neg\, p_8(c_{12}, c_{13}, c_{14})$ cnf(not_p8$_8$, negated_conjecture)
$p_2(x_{17}, x_{18}) \Rightarrow p_4(f_6(x_{17}), f_6(x_{18}))$ cnf(p4$_9$, negated_conjecture)
$p_2(x_{10}, x_{11}) \Rightarrow p_2(f_3(x_{10}), f_3(x_{11}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{15}, x_{16}) \Rightarrow p_4(f_5(x_{15}), f_5(x_{16}))$ cnf(p4$_{11}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{12}$, negated_conjecture)
$(p_7(x_{19}, x_{20})$ and $p_7(x_{19}, x_{21})) \Rightarrow p_7(x_{20}, x_{21})$ cnf(p7$_{13}$, negated_conjecture)
$(p_4(x_{12}, x_{13})$ and $p_4(x_{12}, x_{14})) \Rightarrow p_4(x_{13}, x_{14})$ cnf(p4$_{14}$, negated_conjecture)
$(p_2(x_7, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_2(x_8, x_9)$ cnf(p2$_{15}$, negated_conjecture)
$(p_{11}(x_{29}, c_{16})$ and $p_9(c_{12}, x_{28})) \Rightarrow p_8(c_{12}, x_{28}, x_{29})$ cnf(p8$_{16}$, negated_conjecture)
$p_9(c_{12}, x_{30}) \Rightarrow (p_9(c_{12}, f_5(x_{31}))$ or $p_8(c_{12}, x_{30}, x_{31}))$ cnf(p9$_{17}$, negated_conjecture)

$p_9(c_{12}, x_{30}) \Rightarrow (p_9(c_{12}, f_6(x_{31}))$ or $p_8(c_{12}, x_{30}, f_3(x_{31})))$ cnf(p9$_{18}$, negated_conjecture)
$(p_7(x_{35}, x_{32})$ and $p_9(x_{35}, x_{34})$ and $p_4(x_{34}, x_{33})) \Rightarrow p_9(x_{32}, x_{33})$ cnf(p9$_{19}$, negated_conjecture)
$(p_{11}(x_6, x_5)$ and $p_2(x_6, x_3)$ and $p_{10}(x_5, x_4)) \Rightarrow p_{11}(x_3, x_4)$ cnf(p11$_{20}$, negated_conjecture)
$(p_9(c_{12}, x_{30})$ and $p_8(c_{12}, f_5(x_{31}), f_3(x_{31}))) \Rightarrow p_8(c_{12}, x_{30}, x_{31})$ cnf(p8$_{21}$, negated_conjecture)
$(p_9(c_{12}, x_{30})$ and $p_8(c_{12}, f_6(x_{31}), x_{31})) \Rightarrow p_8(c_{12}, x_{30}, f_3(x_{31}))$ cnf(p8$_{22}$, negated_conjecture)
$(p_2(x_{25}, x_{24})$ and $p_4(x_{26}, x_{23})$ and $p_7(x_{27}, x_{22})$ and $p_8(x_{27}, x_{26}, x_{25})) \Rightarrow p_8(x_{22}, x_{23}, x_{24})$ cnf(p8$_{23}$, negated_conjecture)

SYN581-1.p Harrison problem 3466
$p_7(x_{34}, x_{34})$ cnf(p7$_1$, negated_conjecture)
$p_2(x_{18}, x_{18})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{31}, x_{31})$ cnf(p5$_3$, negated_conjecture)
$p_{12}(c_{13}, c_{18})$ cnf(p12$_4$, negated_conjecture)
$p_2(c_{18}, c_{14})$ cnf(p2$_5$, negated_conjecture)
$p_2(f_3(c_{18}), f_8(f_9(c_{17})))$ cnf(p2$_6$, negated_conjecture)
$p_{11}(f_4(f_6(c_{15}, c_{13})), c_{16})$ cnf(p11$_7$, negated_conjecture)
$p_{11}(f_4(f_6(c_{15}, c_{14})), c_{16})$ cnf(p11$_8$, negated_conjecture)
$\neg\, p_{11}(f_4(f_6(c_{15}, c_{18})), c_{16})$ cnf(not_p11$_9$, negated_conjecture)
$p_{12}(x_{11}, x_{12}) \Rightarrow p_{11}(x_{11}, x_{12})$ cnf(p11$_{10}$, negated_conjecture)
$p_2(x_{11}, x_{12}) \Rightarrow p_{11}(x_{11}, x_{12})$ cnf(p11$_{11}$, negated_conjecture)
$p_7(x_{37}, x_{38}) \Rightarrow p_7(f_9(x_{37}), f_9(x_{38}))$ cnf(p7$_{12}$, negated_conjecture)
$p_2(x_{21}, x_{22}) \Rightarrow p_2(f_3(x_{21}), f_3(x_{22}))$ cnf(p2$_{13}$, negated_conjecture)
$p_2(x_{23}, x_{24}) \Rightarrow p_2(f_4(x_{23}), f_4(x_{24}))$ cnf(p2$_{14}$, negated_conjecture)
$p_7(x_{29}, x_{30}) \Rightarrow p_2(f_8(x_{29}), f_8(x_{30}))$ cnf(p2$_{15}$, negated_conjecture)
$p_{11}(x_{11}, x_{12}) \Rightarrow (p_{12}(x_{11}, x_{12})$ or $p_2(x_{11}, x_{12}))$ cnf(p12$_{16}$, negated_conjecture)
$(p_7(x_{34}, x_{35})$ and $p_7(x_{34}, x_{36})) \Rightarrow p_7(x_{35}, x_{36})$ cnf(p7$_{17}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{18}$, negated_conjecture)
$(p_5(x_{31}, x_{32})$ and $p_5(x_{31}, x_{33})) \Rightarrow p_5(x_{32}, x_{33})$ cnf(p5$_{19}$, negated_conjecture)
$(p_{11}(x_6, c_{14})$ and $p_{11}(c_{13}, x_6)) \Rightarrow p_{10}(c_{15}, f_3(x_6), x_6)$ cnf(p10$_{20}$, negated_conjecture)
$(p_2(x_9, x_7)$ and $p_2(x_{10}, x_8)$ and $p_{11}(x_9, x_{10})) \Rightarrow p_{11}(x_7, x_8)$ cnf(p11$_{21}$, negated_conjecture)
$(p_2(x_{16}, x_{14})$ and $p_2(x_{17}, x_{15})$ and $p_{12}(x_{16}, x_{17})) \Rightarrow p_{12}(x_{14}, x_{15})$ cnf(p12$_{22}$, negated_conjecture)
$(p_2(x_{26}, x_{28})$ and $p_5(x_{25}, x_{27})) \Rightarrow p_2(f_6(x_{25}, x_{26}), f_6(x_{27}, x_{28}))$ cnf(p2$_{23}$, negated_conjecture)
$(p_5(x_3, x_0)$ and $p_2(x_5, x_2)$ and $p_2(x_4, x_1)$ and $p_{10}(x_3, x_4, x_5)) \Rightarrow p_{10}(x_0, x_1, x_2)$ cnf(p10$_{24}$, negated_conjecture)
$(p_{12}(x_{13}, c_{14})$ and $p_{12}(c_{13}, x_{13})$ and $p_2(f_3(x_{13}), f_8(f_9(c_{17})))) \Rightarrow p_{11}(f_4(f_6(c_{15}, x_{13})), c_{16})$ cnf(p11$_{25}$, negated_conjecture)

SYN582-1.p Harrison problem 3467
$p_7(x_{34}, x_{34})$ cnf(p7$_1$, negated_conjecture)
$p_2(x_{18}, x_{18})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{31}, x_{31})$ cnf(p5$_3$, negated_conjecture)
$p_{12}(c_{18}, c_{14})$ cnf(p12$_4$, negated_conjecture)
$p_2(c_{13}, c_{18})$ cnf(p2$_5$, negated_conjecture)
$p_2(f_3(c_{18}), f_8(f_9(c_{17})))$ cnf(p2$_6$, negated_conjecture)
$p_{11}(f_4(f_6(c_{15}, c_{13})), c_{16})$ cnf(p11$_7$, negated_conjecture)
$p_{11}(f_4(f_6(c_{15}, c_{14})), c_{16})$ cnf(p11$_8$, negated_conjecture)
$\neg\, p_{11}(f_4(f_6(c_{15}, c_{18})), c_{16})$ cnf(not_p11$_9$, negated_conjecture)
$p_{12}(x_{11}, x_{12}) \Rightarrow p_{11}(x_{11}, x_{12})$ cnf(p11$_{10}$, negated_conjecture)
$p_2(x_{11}, x_{12}) \Rightarrow p_{11}(x_{11}, x_{12})$ cnf(p11$_{11}$, negated_conjecture)
$p_7(x_{37}, x_{38}) \Rightarrow p_7(f_9(x_{37}), f_9(x_{38}))$ cnf(p7$_{12}$, negated_conjecture)
$p_2(x_{21}, x_{22}) \Rightarrow p_2(f_3(x_{21}), f_3(x_{22}))$ cnf(p2$_{13}$, negated_conjecture)
$p_2(x_{23}, x_{24}) \Rightarrow p_2(f_4(x_{23}), f_4(x_{24}))$ cnf(p2$_{14}$, negated_conjecture)
$p_7(x_{29}, x_{30}) \Rightarrow p_2(f_8(x_{29}), f_8(x_{30}))$ cnf(p2$_{15}$, negated_conjecture)
$p_{11}(x_{11}, x_{12}) \Rightarrow (p_{12}(x_{11}, x_{12})$ or $p_2(x_{11}, x_{12}))$ cnf(p12$_{16}$, negated_conjecture)
$(p_7(x_{34}, x_{35})$ and $p_7(x_{34}, x_{36})) \Rightarrow p_7(x_{35}, x_{36})$ cnf(p7$_{17}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{18}$, negated_conjecture)
$(p_5(x_{31}, x_{32})$ and $p_5(x_{31}, x_{33})) \Rightarrow p_5(x_{32}, x_{33})$ cnf(p5$_{19}$, negated_conjecture)
$(p_{11}(x_6, c_{14})$ and $p_{11}(c_{13}, x_6)) \Rightarrow p_{10}(c_{15}, f_3(x_6), x_6)$ cnf(p10$_{20}$, negated_conjecture)
$(p_2(x_9, x_7)$ and $p_2(x_{10}, x_8)$ and $p_{11}(x_9, x_{10})) \Rightarrow p_{11}(x_7, x_8)$ cnf(p11$_{21}$, negated_conjecture)
$(p_2(x_{16}, x_{14})$ and $p_2(x_{17}, x_{15})$ and $p_{12}(x_{16}, x_{17})) \Rightarrow p_{12}(x_{14}, x_{15})$ cnf(p12$_{22}$, negated_conjecture)
$(p_2(x_{26}, x_{28})$ and $p_5(x_{25}, x_{27})) \Rightarrow p_2(f_6(x_{25}, x_{26}), f_6(x_{27}, x_{28}))$ cnf(p2$_{23}$, negated_conjecture)
$(p_5(x_3, x_0)$ and $p_2(x_5, x_2)$ and $p_2(x_4, x_1)$ and $p_{10}(x_3, x_4, x_5)) \Rightarrow p_{10}(x_0, x_1, x_2)$ cnf(p10$_{24}$, negated_conjecture)
$(p_{12}(x_{13}, c_{14})$ and $p_{12}(c_{13}, x_{13})$ and $p_2(f_3(x_{13}), f_8(f_9(c_{17})))) \Rightarrow p_{11}(f_4(f_6(c_{15}, x_{13})), c_{16})$ cnf(p11$_{25}$, negated_conjecture)

SYN583-1.p Harrison problem 3468
$p_7(x_{34}, x_{34})$ cnf(p7$_1$, negated_conjecture)
$p_2(x_{18}, x_{18})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{31}, x_{31})$ cnf(p5$_3$, negated_conjecture)
$p_2(c_{13}, c_{18})$ cnf(p2$_4$, negated_conjecture)
$p_2(c_{18}, c_{14})$ cnf(p2$_5$, negated_conjecture)
$p_2(f_3(c_{18}), f_8(f_9(c_{17})))$ cnf(p2$_6$, negated_conjecture)
$p_{11}(f_4(f_6(c_{15}, c_{13})), c_{16})$ cnf(p11$_7$, negated_conjecture)
$p_{11}(f_4(f_6(c_{15}, c_{14})), c_{16})$ cnf(p11$_8$, negated_conjecture)
$\neg\, p_{11}(f_4(f_6(c_{15}, c_{18})), c_{16})$ cnf(not_p11$_9$, negated_conjecture)
$p_{12}(x_{11}, x_{12}) \Rightarrow p_{11}(x_{11}, x_{12})$ cnf(p11$_{10}$, negated_conjecture)
$p_2(x_{11}, x_{12}) \Rightarrow p_{11}(x_{11}, x_{12})$ cnf(p11$_{11}$, negated_conjecture)
$p_7(x_{37}, x_{38}) \Rightarrow p_7(f_9(x_{37}), f_9(x_{38}))$ cnf(p7$_{12}$, negated_conjecture)
$p_2(x_{21}, x_{22}) \Rightarrow p_2(f_3(x_{21}), f_3(x_{22}))$ cnf(p2$_{13}$, negated_conjecture)
$p_2(x_{23}, x_{24}) \Rightarrow p_2(f_4(x_{23}), f_4(x_{24}))$ cnf(p2$_{14}$, negated_conjecture)
$p_7(x_{29}, x_{30}) \Rightarrow p_2(f_8(x_{29}), f_8(x_{30}))$ cnf(p2$_{15}$, negated_conjecture)
$p_{11}(x_{11}, x_{12}) \Rightarrow (p_{12}(x_{11}, x_{12})$ or $p_2(x_{11}, x_{12}))$ cnf(p12$_{16}$, negated_conjecture)
$(p_7(x_{34}, x_{35})$ and $p_7(x_{34}, x_{36})) \Rightarrow p_7(x_{35}, x_{36})$ cnf(p7$_{17}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{18}$, negated_conjecture)
$(p_5(x_{31}, x_{32})$ and $p_5(x_{31}, x_{33})) \Rightarrow p_5(x_{32}, x_{33})$ cnf(p5$_{19}$, negated_conjecture)
$(p_{11}(x_6, c_{14})$ and $p_{11}(c_{13}, x_6)) \Rightarrow p_{10}(c_{15}, f_3(x_6), x_6)$ cnf(p10$_{20}$, negated_conjecture)
$(p_2(x_9, x_7)$ and $p_2(x_{10}, x_8)$ and $p_{11}(x_9, x_{10})) \Rightarrow p_{11}(x_7, x_8)$ cnf(p11$_{21}$, negated_conjecture)
$(p_2(x_{16}, x_{14})$ and $p_2(x_{17}, x_{15})$ and $p_{12}(x_{16}, x_{17})) \Rightarrow p_{12}(x_{14}, x_{15})$ cnf(p12$_{22}$, negated_conjecture)
$(p_2(x_{26}, x_{28})$ and $p_5(x_{25}, x_{27})) \Rightarrow p_2(f_6(x_{25}, x_{26}), f_6(x_{27}, x_{28}))$ cnf(p2$_{23}$, negated_conjecture)
$(p_5(x_3, x_0)$ and $p_2(x_5, x_2)$ and $p_2(x_4, x_1)$ and $p_{10}(x_3, x_4, x_5)) \Rightarrow p_{10}(x_0, x_1, x_2)$ cnf(p10$_{24}$, negated_conjecture)
$(p_{12}(x_{13}, c_{14})$ and $p_{12}(c_{13}, x_{13})$ and $p_2(f_3(x_{13}), f_8(f_9(c_{17})))) \Rightarrow p_{11}(f_4(f_6(c_{15}, x_{13})), c_{16})$ cnf(p11$_{25}$, negated_conjecture)

SYN584-1.p Harrison problem 3511
$p_{12}(x_0, x_0)$ cnf(p12$_1$, negated_conjecture)
$p_6(x_{42}, x_{42})$ cnf(p6$_2$, negated_conjecture)
$p_5(x_{31}, x_{31})$ cnf(p5$_3$, negated_conjecture)
$p_3(x_{26}, x_{26})$ cnf(p3$_4$, negated_conjecture)
$p_2(x_{19}, x_{19})$ cnf(p2$_5$, negated_conjecture)
$p_5(x_{36}, x_{37}) \Rightarrow p_5(f_{11}(x_{36}), f_{11}(x_{37}))$ cnf(p5$_6$, negated_conjecture)
$p_2(x_{29}, x_{30}) \Rightarrow p_3(f_4(x_{29}), f_4(x_{30}))$ cnf(p3$_7$, negated_conjecture)
$p_5(x_{34}, x_{35}) \Rightarrow p_5(f_{10}(x_{34}), f_{10}(x_{35}))$ cnf(p5$_8$, negated_conjecture)
$(p_{12}(x_0, x_1)$ and $p_{12}(x_0, x_2)) \Rightarrow p_{12}(x_1, x_2)$ cnf(p12$_9$, negated_conjecture)
$(p_6(x_{42}, x_{43})$ and $p_6(x_{42}, x_{44})) \Rightarrow p_6(x_{43}, x_{44})$ cnf(p6$_{10}$, negated_conjecture)
$(p_5(x_{31}, x_{32})$ and $p_5(x_{31}, x_{33})) \Rightarrow p_5(x_{32}, x_{33})$ cnf(p5$_{11}$, negated_conjecture)
$(p_3(x_{26}, x_{27})$ and $p_3(x_{26}, x_{28})) \Rightarrow p_3(x_{27}, x_{28})$ cnf(p3$_{12}$, negated_conjecture)
$(p_2(x_{19}, x_{20})$ and $p_2(x_{19}, x_{21})) \Rightarrow p_2(x_{20}, x_{21})$ cnf(p2$_{13}$, negated_conjecture)
$(p_{12}(x_{18}, x_{16})$ and $p_{16}(x_{17}, x_{18})$ and $p_{12}(x_{17}, x_{15})) \Rightarrow p_{16}(x_{15}, x_{16})$ cnf(p16$_{14}$, negated_conjecture)
$(p_{15}(x_{13}, x_{14})$ and $p_3(x_{14}, x_{12})$ and $p_{12}(x_{13}, x_{11})) \Rightarrow p_{15}(x_{11}, x_{12})$ cnf(p15$_{15}$, negated_conjecture)
$(p_{12}(x_3, x_5)$ and $p_{12}(x_4, x_6)) \Rightarrow p_{12}(f_{13}(x_3, x_4), f_{13}(x_5, x_6))$ cnf(p12$_{16}$, negated_conjecture)
$(p_5(x_{45}, x_{47})$ and $p_5(x_{46}, x_{48})) \Rightarrow p_6(f_8(x_{45}, x_{46}), f_8(x_{47}, x_{48}))$ cnf(p6$_{17}$, negated_conjecture)
$(p_5(x_{38}, x_{40})$ and $p_5(x_{39}, x_{41})) \Rightarrow p_5(f_9(x_{38}, x_{39}), f_9(x_{40}, x_{41}))$ cnf(p5$_{18}$, negated_conjecture)
$(p_5(x_{22}, x_{24})$ and $p_6(x_{23}, x_{25})) \Rightarrow p_2(f_7(x_{22}, x_{23}), f_7(x_{24}, x_{25}))$ cnf(p2$_{19}$, negated_conjecture)
$(p_{12}(x_8, x_{10})$ and $p_2(x_7, x_9)) \Rightarrow p_{12}(f_{14}(x_7, x_8), f_{14}(x_9, x_{10}))$ cnf(p12$_{20}$, negated_conjecture)
$p_{15}(c_{22}, f_4(f_7(c_{18}, f_8(f_9(c_{19}, f_{10}(f_{11}(c_{20}))), f_9(c_{21}, f_{10}(f_{11}(c_{20})))))))$ cnf(p15$_{21}$, negated_conjecture)
$p_{15}(c_{17}, f_4(f_7(c_{18}, f_8(f_9(c_{19}, f_{10}(f_{11}(c_{20}))), f_9(c_{21}, f_{10}(f_{11}(c_{20})))))))$ cnf(p15$_{22}$, negated_conjecture)
$p_{12}(f_{13}(c_{17}, f_{14}(f_7(c_{18}, f_8(f_9(c_{19}, f_{10}(f_{11}(c_{20}))), f_9(c_{21}, f_{10}(f_{11}(c_{20})))))), c_{17})), c_{22})$ cnf(p12$_{23}$, negated_conjecture)
$(p_{16}(x_{49}, c_{17})$ and $p_{16}(c_{22}, x_{49})) \Rightarrow \neg\, p_{15}(x_{49}, f_4(f_7(c_{18}, f_8(f_9(c_{19}, f_{10}(f_{11}(c_{20}))), f_9(c_{21}, f_{10}(f_{11}(c_{20})))))))$ cnf(not_p16$_{24}$, n
$\neg\, p_{15}(f_{13}(c_{17}, f_{14}(f_7(c_{18}, f_8(f_9(c_{19}, f_{10}(f_{11}(c_{20}))), f_9(c_{21}, f_{10}(f_{11}(c_{20})))))), c_{17})), f_4(f_7(c_{18}, f_8(f_9(c_{19}, f_{10}(f_{11}(c_{20}))), f_9(c_{21}, f_{10}($

SYN585-1.p Harrison problem 3538
$p_2(x_{18}, x_{18})$ cnf(p2$_1$, negated_conjecture)
$p_{11}(x_8, x_8)$ cnf(p11$_2$, negated_conjecture)
$p_{10}(c_{14}, c_{15})$ cnf(p10$_3$, negated_conjecture)
$p_{10}(c_{17}, c_{14})$ cnf(p10$_4$, negated_conjecture)
$\neg\, p_2(c_{14}, f_3(c_{13}))$ cnf(not_p2$_5$, negated_conjecture)

$\neg\, p_2(c_{12}, f_3(c_{13}))$ cnf(not_p2$_6$, negated_conjecture)
$p_{11}(c_{18}, f_9(c_{12}, c_{14}))$ cnf(p11$_7$, negated_conjecture)
$p_2(f_6(c_{15}, c_{14}), c_{17})$ cnf(p2$_8$, negated_conjecture)
$p_2(f_5(c_{15}, c_{14}), c_{16})$ cnf(p2$_9$, negated_conjecture)
$\neg\, p_2(c_{12}, f_3(f_4(c_{13})))$ cnf(not_p2$_{10}$, negated_conjecture)
$p_2(f_7(f_8(c_{16}, c_{14}), c_{17}), c_{15})$ cnf(p2$_{11}$, negated_conjecture)
$\neg\, p_{11}(c_{18}, f_9(c_{12}, f_8(c_{16}, c_{14})))$ cnf(not_p11$_{12}$, negated_conjecture)
$p_{11}(x_9, x_{11}) \Rightarrow p_{11}(x_9, f_8(x_{10}, x_{11}))$ cnf(p11$_{13}$, negated_conjecture)
$p_2(x_{23}, x_{24}) \Rightarrow p_2(f_4(x_{23}), f_4(x_{24}))$ cnf(p2$_{14}$, negated_conjecture)
$p_2(x_{21}, x_{22}) \Rightarrow p_2(f_3(x_{21}), f_3(x_{22}))$ cnf(p2$_{15}$, negated_conjecture)
$(p_{11}(x_{12}, x_{14})$ and $p_{11}(x_{14}, x_{13})) \Rightarrow p_{11}(x_{12}, x_{13})$ cnf(p11$_{16}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{17}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{10}(x_2, x_3)) \Rightarrow p_{10}(x_0, x_1)$ cnf(p10$_{18}$, negated_conjecture)
$(p_2(x_6, x_4)$ and $p_2(x_7, x_5)$ and $p_{11}(x_6, x_7)) \Rightarrow p_{11}(x_4, x_5)$ cnf(p11$_{19}$, negated_conjecture)
$(p_2(x_{41}, x_{43})$ and $p_2(x_{42}, x_{44})) \Rightarrow p_2(f_9(x_{41}, x_{42}), f_9(x_{43}, x_{44}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_2(x_{25}, x_{27})$ and $p_2(x_{26}, x_{28})) \Rightarrow p_2(f_5(x_{25}, x_{26}), f_5(x_{27}, x_{28}))$ cnf(p2$_{21}$, negated_conjecture)
$(p_2(x_{30}, x_{32})$ and $p_2(x_{29}, x_{31})) \Rightarrow p_2(f_6(x_{29}, x_{30}), f_6(x_{31}, x_{32}))$ cnf(p2$_{22}$, negated_conjecture)
$(p_2(x_{33}, x_{35})$ and $p_2(x_{34}, x_{36})) \Rightarrow p_2(f_7(x_{33}, x_{34}), f_7(x_{35}, x_{36}))$ cnf(p2$_{23}$, negated_conjecture)
$(p_2(x_{37}, x_{39})$ and $p_2(x_{38}, x_{40})) \Rightarrow p_2(f_8(x_{37}, x_{38}), f_8(x_{39}, x_{40}))$ cnf(p2$_{24}$, negated_conjecture)
$p_{11}(f_9(x_{17}, x_{15}), f_9(x_{17}, x_{16})) \Rightarrow (p_{11}(x_{15}, x_{16})$ or $p_2(x_{17}, f_3(c_{13})))$ cnf(p11$_{25}$, negated_conjecture)
$p_{11}(x_{15}, x_{16}) \Rightarrow (p_2(x_{17}, f_3(c_{13}))$ or $p_{11}(f_9(x_{17}, x_{15}), f_9(x_{17}, x_{16})))$ cnf(p2$_{26}$, negated_conjecture)

SYN586-1.p Harrison problem 3571
$p_{12}(x_0, x_0)$ cnf(p12$_1$, negated_conjecture)
$p_5(x_{37}, x_{37})$ cnf(p5$_2$, negated_conjecture)
$p_3(x_{24}, x_{24})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_{13}, x_{13})$ cnf(p2$_4$, negated_conjecture)
$p_3(c_{21}, c_{19})$ cnf(p3$_5$, negated_conjecture)
$\neg\, p_{12}(f_{13}(c_{20}), f_{13}(c_{18}))$ cnf(not_p12$_6$, negated_conjecture)
$p_2(x_3, x_4) \Rightarrow p_{12}(f_{13}(x_3), f_{13}(x_4))$ cnf(p12$_7$, negated_conjecture)
$p_3(x_{42}, x_{43}) \Rightarrow p_5(f_7(x_{42}), f_7(x_{43}))$ cnf(p5$_8$, negated_conjecture)
$p_5(x_{40}, x_{41}) \Rightarrow p_5(f_{10}(x_{40}), f_{10}(x_{41}))$ cnf(p5$_9$, negated_conjecture)
$p_3(x_{35}, x_{36}) \Rightarrow p_3(f_9(x_{35}), f_9(x_{36}))$ cnf(p3$_{10}$, negated_conjecture)
$p_3(x_{33}, x_{34}) \Rightarrow p_3(f_8(x_{33}), f_8(x_{34}))$ cnf(p3$_{11}$, negated_conjecture)
$p_3(x_{27}, x_{28}) \Rightarrow p_3(f_{11}(x_{27}), f_{11}(x_{28}))$ cnf(p3$_{12}$, negated_conjecture)
$(p_{12}(x_0, x_1)$ and $p_{12}(x_0, x_2)) \Rightarrow p_{12}(x_1, x_2)$ cnf(p12$_{13}$, negated_conjecture)
$(p_5(x_{37}, x_{38})$ and $p_5(x_{37}, x_{39})) \Rightarrow p_5(x_{38}, x_{39})$ cnf(p5$_{14}$, negated_conjecture)
$(p_3(x_{24}, x_{25})$ and $p_3(x_{24}, x_{26})) \Rightarrow p_3(x_{25}, x_{26})$ cnf(p3$_{15}$, negated_conjecture)
$(p_2(x_{13}, x_{14})$ and $p_2(x_{13}, x_{15})) \Rightarrow p_2(x_{14}, x_{15})$ cnf(p2$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_9)$ and $p_2(x_{12}, x_{10})$ and $p_{15}(x_{11}, x_{12})) \Rightarrow p_{15}(x_9, x_{10})$ cnf(p15$_{17}$, negated_conjecture)
$p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), c_{19}), c_{20})$ cnf(p15$_{18}$, negated_conjecture)
$(p_2(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{14}(x_{29}, x_{30}), f_{14}(x_{31}, x_{32}))$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_{16}, x_{18})$ and $p_3(x_{17}, x_{19})) \Rightarrow p_2(f_4(x_{16}, x_{17}), f_4(x_{18}, x_{19}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_2(x_{21}, x_{23})$ and $p_5(x_{20}, x_{22})) \Rightarrow p_2(f_6(x_{20}, x_{21}), f_6(x_{22}, x_{23}))$ cnf(p2$_{21}$, negated_conjecture)
$p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{11}(c_{21})), c_{20})$ cnf(p15$_{22}$, negated_conjecture)
$\neg\, p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{11}(c_{19})), c_{20})$ cnf(not_p15$_{23}$, negated_conjecture)
$p_{12}(f_{13}(x_5), f_{13}(c_{18}))$ or $p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{14}(x_5, x_6)), x_5)$ cnf(p12$_{24}$, negated_conjecture)
$p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{11}(f_{14}(x_5, x_6))), x_5) \Rightarrow p_{12}(f_{13}(x_5), f_{13}(c_{18}))$ cnf(p12$_{25}$, negated_conjecture)
$(p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), x_7), x_5)$ and $p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), x_8), x_5)) \Rightarrow (p_3(x_7, x_8)$ o

SYN587-1.p Harrison problem 3572
$p_{12}(x_0, x_0)$ cnf(p12$_1$, negated_conjecture)
$p_5(x_{37}, x_{37})$ cnf(p5$_2$, negated_conjecture)
$p_3(x_{24}, x_{24})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_{13}, x_{13})$ cnf(p2$_4$, negated_conjecture)
$p_3(c_{21}, c_{19})$ cnf(p3$_5$, negated_conjecture)
$\neg\, p_{12}(f_{13}(c_{20}), f_{13}(c_{18}))$ cnf(not_p12$_6$, negated_conjecture)
$p_2(x_3, x_4) \Rightarrow p_{12}(f_{13}(x_3), f_{13}(x_4))$ cnf(p12$_7$, negated_conjecture)
$p_3(x_{42}, x_{43}) \Rightarrow p_5(f_7(x_{42}), f_7(x_{43}))$ cnf(p5$_8$, negated_conjecture)
$p_5(x_{40}, x_{41}) \Rightarrow p_5(f_{10}(x_{40}), f_{10}(x_{41}))$ cnf(p5$_9$, negated_conjecture)

$p_3(x_{35}, x_{36}) \Rightarrow p_3(f_9(x_{35}), f_9(x_{36}))$ cnf(p3$_{10}$, negated_conjecture)
$p_3(x_{33}, x_{34}) \Rightarrow p_3(f_8(x_{33}), f_8(x_{34}))$ cnf(p3$_{11}$, negated_conjecture)
$p_3(x_{27}, x_{28}) \Rightarrow p_3(f_{11}(x_{27}), f_{11}(x_{28}))$ cnf(p3$_{12}$, negated_conjecture)
$(p_{12}(x_0, x_1)$ and $p_{12}(x_0, x_2)) \Rightarrow p_{12}(x_1, x_2)$ cnf(p12$_{13}$, negated_conjecture)
$(p_5(x_{37}, x_{38})$ and $p_5(x_{37}, x_{39})) \Rightarrow p_5(x_{38}, x_{39})$ cnf(p5$_{14}$, negated_conjecture)
$(p_3(x_{24}, x_{25})$ and $p_3(x_{24}, x_{26})) \Rightarrow p_3(x_{25}, x_{26})$ cnf(p3$_{15}$, negated_conjecture)
$(p_2(x_{13}, x_{14})$ and $p_2(x_{13}, x_{15})) \Rightarrow p_2(x_{14}, x_{15})$ cnf(p2$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_9)$ and $p_2(x_{12}, x_{10})$ and $p_{15}(x_{11}, x_{12})) \Rightarrow p_{15}(x_9, x_{10})$ cnf(p15$_{17}$, negated_conjecture)
$p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), c_{19}), c_{20})$ cnf(p15$_{18}$, negated_conjecture)
$\neg p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), c_{21}), c_{20})$ cnf(not_p15$_{19}$, negated_conjecture)
$(p_2(x_{16}, x_{18})$ and $p_3(x_{17}, x_{19})) \Rightarrow p_2(f_4(x_{16}, x_{17}), f_4(x_{18}, x_{19}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_2(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{14}(x_{29}, x_{30}), f_{14}(x_{31}, x_{32}))$ cnf(p3$_{21}$, negated_conjecture)
$(p_2(x_{21}, x_{23})$ and $p_5(x_{20}, x_{22})) \Rightarrow p_2(f_6(x_{20}, x_{21}), f_6(x_{22}, x_{23}))$ cnf(p2$_{22}$, negated_conjecture)
$\neg p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{11}(c_{19})), c_{20})$ cnf(not_p15$_{23}$, negated_conjecture)
$p_{12}(f_{13}(x_5), f_{13}(c_{18}))$ or $p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{14}(x_5, x_6)), x_5)$ cnf(p12$_{24}$, negated_conjecture)
$p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{11}(f_{14}(x_5, x_6))), x_5) \Rightarrow p_{12}(f_{13}(x_5), f_{13}(c_{18}))$ cnf(p12$_{25}$, negated_conjecture)
$(p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), x_7), x_5)$ and $p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), x_8), x_5)) \Rightarrow (p_3(x_7, x_8)$ o

SYN588-1.p Harrison problem 3577
$p_2(x_8, x_8)$ cnf(p2$_1$, negated_conjecture)
$p_7(x_{25}, x_{25})$ cnf(p7$_2$, negated_conjecture)
$p_2(c_{25}, f_3(c_{17}))$ cnf(p2$_3$, negated_conjecture)
$\neg p_2(c_{16}, f_3(c_{17}))$ cnf(not_p2$_4$, negated_conjecture)
$p_{14}(c_{18}, f_3(f_4(f_5(c_{17}))))$ cnf(p14$_5$, negated_conjecture)
$p_{14}(c_{23}, f_3(f_4(f_5(c_{17}))))$ cnf(p14$_6$, negated_conjecture)
$p_{14}(c_{19}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ cnf(p14$_7$, negated_conjecture)
$p_{14}(c_{24}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ cnf(p14$_8$, negated_conjecture)
$p_7(x_{34}, x_{35}) \Rightarrow p_7(f_{12}(x_{34}), f_{12}(x_{35}))$ cnf(p7$_9$, negated_conjecture)
$p_2(x_{15}, x_{16}) \Rightarrow p_2(f_3(x_{15}), f_3(x_{16}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{17}, x_{18}) \Rightarrow p_2(f_4(x_{17}), f_4(x_{18}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{19}, x_{20}) \Rightarrow p_2(f_5(x_{19}), f_5(x_{20}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{32}, x_{33}) \Rightarrow p_7(f_{11}(x_{32}), f_{11}(x_{33}))$ cnf(p7$_{13}$, negated_conjecture)
$(p_7(x_{25}, x_{26})$ and $p_7(x_{25}, x_{27})) \Rightarrow p_7(x_{26}, x_{27})$ cnf(p7$_{14}$, negated_conjecture)
$(p_2(x_8, x_9)$ and $p_2(x_8, x_{10})) \Rightarrow p_2(x_9, x_{10})$ cnf(p2$_{15}$, negated_conjecture)
$p_{15}(f_6(f_3(f_4(f_5(c_{17}))), f_{13}(c_{16}, f_3(f_5(c_{17})))), c_{19})$ cnf(p15$_{16}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{14}(x_2, x_3)) \Rightarrow p_{14}(x_0, x_1)$ cnf(p14$_{17}$, negated_conjecture)
$(p_2(x_6, x_4)$ and $p_2(x_7, x_5)$ and $p_{15}(x_6, x_7)) \Rightarrow p_{15}(x_4, x_5)$ cnf(p15$_{18}$, negated_conjecture)
$(p_2(x_{11}, x_{13})$ and $p_2(x_{12}, x_{14})) \Rightarrow p_2(f_{13}(x_{11}, x_{12}), f_{13}(x_{13}, x_{14}))$ cnf(p2$_{19}$, negated_conjecture)
$(p_7(x_{40}, x_{42})$ and $p_7(x_{41}, x_{43})) \Rightarrow p_7(f_9(x_{40}, x_{41}), f_9(x_{42}, x_{43}))$ cnf(p7$_{20}$, negated_conjecture)
$(p_7(x_{36}, x_{38})$ and $p_7(x_{37}, x_{39})) \Rightarrow p_7(f_8(x_{36}, x_{37}), f_8(x_{38}, x_{39}))$ cnf(p7$_{21}$, negated_conjecture)
$(p_2(x_{29}, x_{31})$ and $p_7(x_{28}, x_{30})) \Rightarrow p_7(f_{10}(x_{28}, x_{29}), f_{10}(x_{30}, x_{31}))$ cnf(p7$_{22}$, negated_conjecture)
$(p_2(x_{21}, x_{23})$ and $p_2(x_{22}, x_{24})) \Rightarrow p_2(f_6(x_{21}, x_{22}), f_6(x_{23}, x_{24}))$ cnf(p2$_{23}$, negated_conjecture)
$p_7(c_{20}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{23}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{25}), f_9(f_{11}(c_{24}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))))$ cnf
$p_7(c_{20}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{18}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{21}), f_9(f_{11}(c_{19}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))))$ cnf
$\neg p_7(f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{18}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{21}), f_9(f_{11}(c_{19}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))), f_8(f_{10}(f_{12}$

SYN589-1.p Harrison problem 3578
$p_2(x_8, x_8)$ cnf(p2$_1$, negated_conjecture)
$p_7(x_{25}, x_{25})$ cnf(p7$_2$, negated_conjecture)
$p_2(c_{21}, f_3(c_{17}))$ cnf(p2$_3$, negated_conjecture)
$\neg p_2(c_{16}, f_3(c_{17}))$ cnf(not_p2$_4$, negated_conjecture)
$p_{14}(c_{18}, f_3(f_4(f_5(c_{17}))))$ cnf(p14$_5$, negated_conjecture)
$p_{14}(c_{23}, f_3(f_4(f_5(c_{17}))))$ cnf(p14$_6$, negated_conjecture)
$p_{14}(c_{19}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ cnf(p14$_7$, negated_conjecture)
$p_{14}(c_{24}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ cnf(p14$_8$, negated_conjecture)
$p_7(x_{34}, x_{35}) \Rightarrow p_7(f_{12}(x_{34}), f_{12}(x_{35}))$ cnf(p7$_9$, negated_conjecture)
$p_2(x_{15}, x_{16}) \Rightarrow p_2(f_3(x_{15}), f_3(x_{16}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{17}, x_{18}) \Rightarrow p_2(f_4(x_{17}), f_4(x_{18}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{19}, x_{20}) \Rightarrow p_2(f_5(x_{19}), f_5(x_{20}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{32}, x_{33}) \Rightarrow p_7(f_{11}(x_{32}), f_{11}(x_{33}))$ cnf(p7$_{13}$, negated_conjecture)

$(p_7(x_{25}, x_{26})$ and $p_7(x_{25}, x_{27})) \Rightarrow p_7(x_{26}, x_{27})$ cnf(p7$_{14}$, negated_conjecture)
$(p_2(x_8, x_9)$ and $p_2(x_8, x_{10})) \Rightarrow p_2(x_9, x_{10})$ cnf(p2$_{15}$, negated_conjecture)
$p_{15}(f_6(f_3(f_4(f_5(c_{17}))), f_{13}(c_{16}, f_3(f_5(c_{17})))), c_{24})$ cnf(p15$_{16}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{14}(x_2, x_3)) \Rightarrow p_{14}(x_0, x_1)$ cnf(p14$_{17}$, negated_conjecture)
$(p_2(x_6, x_4)$ and $p_2(x_7, x_5)$ and $p_{15}(x_6, x_7)) \Rightarrow p_{15}(x_4, x_5)$ cnf(p15$_{18}$, negated_conjecture)
$(p_2(x_{11}, x_{13})$ and $p_2(x_{12}, x_{14})) \Rightarrow p_2(f_{13}(x_{11}, x_{12}), f_{13}(x_{13}, x_{14}))$ cnf(p2$_{19}$, negated_conjecture)
$(p_7(x_{40}, x_{42})$ and $p_7(x_{41}, x_{43})) \Rightarrow p_7(f_9(x_{40}, x_{41}), f_9(x_{42}, x_{43}))$ cnf(p7$_{20}$, negated_conjecture)
$(p_7(x_{36}, x_{38})$ and $p_7(x_{37}, x_{39})) \Rightarrow p_7(f_8(x_{36}, x_{37}), f_8(x_{38}, x_{39}))$ cnf(p7$_{21}$, negated_conjecture)
$(p_2(x_{29}, x_{31})$ and $p_7(x_{28}, x_{30})) \Rightarrow p_7(f_{10}(x_{28}, x_{29}), f_{10}(x_{30}, x_{31}))$ cnf(p7$_{22}$, negated_conjecture)
$(p_2(x_{21}, x_{23})$ and $p_2(x_{22}, x_{24})) \Rightarrow p_2(f_6(x_{21}, x_{22}), f_6(x_{23}, x_{24}))$ cnf(p2$_{23}$, negated_conjecture)
$p_7(c_{20}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{23}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{25}), f_9(f_{11}(c_{24}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))))$ cnf
$p_7(c_{20}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{18}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{21}), f_9(f_{11}(c_{19}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))))$ cnf
$\neg p_7(f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{18}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{21}), f_9(f_{11}(c_{19}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))), f_8(f_{10}(f_{12}$

SYN590-1.p Harrison problem 3582
$p_{11}(c_{14})$ cnf(c14_is_p11$_1$, negated_conjecture)
$p_{11}(c_{17})$ cnf(c17_is_p11$_2$, negated_conjecture)
$p_{11}(c_{16})$ cnf(c16_is_p11$_3$, negated_conjecture)
$p_5(x_{27}, x_{27})$ cnf(p5$_4$, negated_conjecture)
$p_2(x_{14}, x_{14})$ cnf(p2$_5$, negated_conjecture)
$p_3(x_{19}, x_{19})$ cnf(p3$_6$, negated_conjecture)
$p_3(f_4(c_{17}), f_6(c_{18}))$ cnf(p3$_7$, negated_conjecture)
$p_3(f_4(c_{16}), f_6(c_{15}))$ cnf(p3$_8$, negated_conjecture)
$p_{11}(x_4) \Rightarrow p_{11}(f_9(x_4))$ cnf(p11$_9$, negated_conjecture)
$(p_{11}(x_9)$ and $p_2(x_9, x_8)) \Rightarrow p_{11}(x_8)$ cnf(p11$_{10}$, negated_conjecture)
$p_{10}(f_6(x_5), f_6(x_6)) \Rightarrow p_{12}(x_5, x_6)$ cnf(p12$_{11}$, negated_conjecture)
$p_2(x_{32}, x_{33}) \Rightarrow p_5(f_8(x_{32}), f_8(x_{33}))$ cnf(p5$_{12}$, negated_conjecture)
$p_{12}(x_5, x_6) \Rightarrow p_{10}(f_6(x_5), f_6(x_6))$ cnf(p10$_{13}$, negated_conjecture)
$p_2(x_{17}, x_{18}) \Rightarrow p_2(f_9(x_{17}), f_9(x_{18}))$ cnf(p2$_{14}$, negated_conjecture)
$p_2(x_{22}, x_{23}) \Rightarrow p_3(f_4(x_{22}), f_4(x_{23}))$ cnf(p3$_{15}$, negated_conjecture)
$p_5(x_{25}, x_{26}) \Rightarrow p_3(f_6(x_{25}), f_6(x_{26}))$ cnf(p3$_{16}$, negated_conjecture)
$p_5(x_{30}, x_{31}) \Rightarrow p_5(f_7(x_{30}), f_7(x_{31}))$ cnf(p5$_{17}$, negated_conjecture)
$p_{11}(x_{24}) \Rightarrow p_3(f_4(x_{24}), f_6(f_8(x_{24})))$ cnf(p3$_{18}$, negated_conjecture)
$p_{11}(x_4) \Rightarrow p_{10}(f_4(f_9(x_4)), f_4(x_4))$ cnf(p10$_{19}$, negated_conjecture)
$p_{11}(x_7) \Rightarrow p_{10}(f_6(f_7(c_{13})), f_4(x_7))$ cnf(p10$_{20}$, negated_conjecture)
$p_{11}(x_4) \Rightarrow p_{10}(f_6(f_7(c_{13})), f_4(x_4))$ cnf(p10$_{21}$, negated_conjecture)
$(p_5(x_{27}, x_{28})$ and $p_5(x_{27}, x_{29})) \Rightarrow p_5(x_{28}, x_{29})$ cnf(p5$_{22}$, negated_conjecture)
$(p_2(x_{14}, x_{15})$ and $p_2(x_{14}, x_{16})) \Rightarrow p_2(x_{15}, x_{16})$ cnf(p2$_{23}$, negated_conjecture)
$(p_3(x_{19}, x_{20})$ and $p_3(x_{19}, x_{21})) \Rightarrow p_3(x_{20}, x_{21})$ cnf(p3$_{24}$, negated_conjecture)
$(p_{11}(x_{34})$ and $p_{12}(x_{35}, c_{15})) \Rightarrow \neg p_3(f_4(x_{34}), f_6(x_{35}))$ cnf(not_p11$_{25}$, negated_conjecture)
$(p_3(x_2, x_0)$ and $p_3(x_3, x_1)$ and $p_{10}(x_2, x_3)) \Rightarrow p_{10}(x_0, x_1)$ cnf(p10$_{26}$, negated_conjecture)
$(p_5(x_{12}, x_{10})$ and $p_5(x_{13}, x_{11})$ and $p_{12}(x_{12}, x_{13})) \Rightarrow p_{12}(x_{10}, x_{11})$ cnf(p12$_{27}$, negated_conjecture)

SYN591-1.p Harrison problem 3583
$p_9(c_{14})$ cnf(c14_is_p9$_1$, negated_conjecture)
$p_8(c_{13})$ cnf(c13_is_p8$_2$, negated_conjecture)
$p_7(x_{30}, x_{30})$ cnf(p7$_3$, negated_conjecture)
$p_2(x_{15}, x_{15})$ cnf(p2$_4$, negated_conjecture)
$p_3(x_{23}, x_{23})$ cnf(p3$_5$, negated_conjecture)
$p_{10}(c_{14}, x_4)$ cnf(p10$_6$, negated_conjecture)
$p_{10}(c_{13}, c_{15})$ cnf(p10$_7$, negated_conjecture)
$p_{10}(c_{13}, c_{17})$ cnf(p10$_8$, negated_conjecture)
$p_{10}(c_{13}, c_{16})$ cnf(p10$_9$, negated_conjecture)
$\neg p_2(c_{15}, c_{17})$ cnf(not_p2$_{10}$, negated_conjecture)
$p_{12}(c_{14}, f_4(c_{18}, c_{17}))$ cnf(p12$_{11}$, negated_conjecture)
$\neg p_{11}(c_{13}, f_4(c_{17}, f_6(c_{18})))$ cnf(not_p11$_{12}$, negated_conjecture)
$\neg p_{11}(c_{13}, f_4(f_6(c_{18}), c_{17}))$ cnf(not_p11$_{13}$, negated_conjecture)
$(p_8(x_{34})$ and $p_7(x_{34}, x_{33})) \Rightarrow p_8(x_{33})$ cnf(p8$_{14}$, negated_conjecture)
$(p_9(x_{36})$ and $p_7(x_{36}, x_{35})) \Rightarrow p_9(x_{35})$ cnf(p9$_{15}$, negated_conjecture)
$p_{10}(c_{13}, x_{10}) \Rightarrow p_{11}(c_{14}, f_4(c_{15}, x_{10}))$ cnf(p11$_{16}$, negated_conjecture)

$p_2(x_{18}, x_{19}) \Rightarrow p_2(f_5(x_{18}), f_5(x_{19}))$ cnf(p2$_{17}$, negated_conjecture)
$p_2(x_{21}, x_{22}) \Rightarrow p_2(f_6(x_{21}), f_6(x_{22}))$ cnf(p2$_{18}$, negated_conjecture)
$(p_7(x_{30}, x_{31})$ and $p_7(x_{30}, x_{32})) \Rightarrow p_7(x_{31}, x_{32})$ cnf(p7$_{19}$, negated_conjecture)
$(p_2(x_{15}, x_{16})$ and $p_2(x_{15}, x_{17})) \Rightarrow p_2(x_{16}, x_{17})$ cnf(p2$_{20}$, negated_conjecture)
$(p_3(x_{23}, x_{24})$ and $p_3(x_{23}, x_{25})) \Rightarrow p_3(x_{24}, x_{25})$ cnf(p3$_{21}$, negated_conjecture)
$p_{12}(c_{14}, f_4(x_{20}, c_{17})) \Rightarrow p_2(f_6(x_{20}), f_5(x_{20}))$ cnf(p2$_{22}$, negated_conjecture)
$(p_2(x_3, x_1)$ and $p_7(x_2, x_0)$ and $p_{10}(x_2, x_3)) \Rightarrow p_{10}(x_0, x_1)$ cnf(p10$_{23}$, negated_conjecture)
$(p_3(x_{14}, x_{12})$ and $p_7(x_{13}, x_{11})$ and $p_{12}(x_{13}, x_{14})) \Rightarrow p_{12}(x_{11}, x_{12})$ cnf(p12$_{24}$, negated_conjecture)
$(p_3(x_8, x_6)$ and $p_7(x_7, x_5)$ and $p_{11}(x_7, x_8)) \Rightarrow p_{11}(x_5, x_6)$ cnf(p11$_{25}$, negated_conjecture)
$(p_2(x_{26}, x_{28})$ and $p_2(x_{27}, x_{29})) \Rightarrow p_3(f_4(x_{26}, x_{27}), f_4(x_{28}, x_{29}))$ cnf(p3$_{26}$, negated_conjecture)
$p_{12}(c_{14}, f_4(x_9, c_{17})) \Rightarrow (p_{11}(c_{13}, f_4(c_{17}, f_5(x_9)))$ or $p_{11}(c_{13}, f_4(f_5(x_9), c_{17})))$ cnf(p11$_{27}$, negated_conjecture)

SYN592-1.p Harrison problem 3584
$p_9(c_{14})$ cnf(c14_is_p9$_1$, negated_conjecture)
$p_8(c_{13})$ cnf(c13_is_p8$_2$, negated_conjecture)
$p_7(x_{30}, x_{30})$ cnf(p7$_3$, negated_conjecture)
$p_2(x_{15}, x_{15})$ cnf(p2$_4$, negated_conjecture)
$p_3(x_{23}, x_{23})$ cnf(p3$_5$, negated_conjecture)
$p_{10}(c_{14}, x_4)$ cnf(p10$_6$, negated_conjecture)
$p_{10}(c_{13}, c_{15})$ cnf(p10$_7$, negated_conjecture)
$p_{10}(c_{13}, c_{17})$ cnf(p10$_8$, negated_conjecture)
$p_{10}(c_{13}, c_{16})$ cnf(p10$_9$, negated_conjecture)
$\neg p_2(c_{17}, c_{15})$ cnf(not_p2$_{10}$, negated_conjecture)
$p_{12}(c_{14}, f_4(c_{18}, c_{17}))$ cnf(p12$_{11}$, negated_conjecture)
$\neg p_{11}(c_{13}, f_4(c_{17}, f_5(c_{18})))$ cnf(not_p11$_{12}$, negated_conjecture)
$\neg p_{11}(c_{13}, f_4(f_5(c_{18}), c_{17}))$ cnf(not_p11$_{13}$, negated_conjecture)
$(p_8(x_{34})$ and $p_7(x_{34}, x_{33})) \Rightarrow p_8(x_{33})$ cnf(p8$_{14}$, negated_conjecture)
$(p_9(x_{36})$ and $p_7(x_{36}, x_{35})) \Rightarrow p_9(x_{35})$ cnf(p9$_{15}$, negated_conjecture)
$p_{10}(c_{13}, x_{10}) \Rightarrow p_{11}(c_{14}, f_4(c_{15}, x_{10}))$ cnf(p11$_{16}$, negated_conjecture)
$p_2(x_{18}, x_{19}) \Rightarrow p_2(f_5(x_{18}), f_5(x_{19}))$ cnf(p2$_{17}$, negated_conjecture)
$p_2(x_{21}, x_{22}) \Rightarrow p_2(f_6(x_{21}), f_6(x_{22}))$ cnf(p2$_{18}$, negated_conjecture)
$(p_7(x_{30}, x_{31})$ and $p_7(x_{30}, x_{32})) \Rightarrow p_7(x_{31}, x_{32})$ cnf(p7$_{19}$, negated_conjecture)
$(p_2(x_{15}, x_{16})$ and $p_2(x_{15}, x_{17})) \Rightarrow p_2(x_{16}, x_{17})$ cnf(p2$_{20}$, negated_conjecture)
$(p_3(x_{23}, x_{24})$ and $p_3(x_{23}, x_{25})) \Rightarrow p_3(x_{24}, x_{25})$ cnf(p3$_{21}$, negated_conjecture)
$p_{12}(c_{14}, f_4(x_{20}, c_{17})) \Rightarrow p_2(f_6(x_{20}), f_5(x_{20}))$ cnf(p2$_{22}$, negated_conjecture)
$(p_2(x_3, x_1)$ and $p_7(x_2, x_0)$ and $p_{10}(x_2, x_3)) \Rightarrow p_{10}(x_0, x_1)$ cnf(p10$_{23}$, negated_conjecture)
$(p_3(x_{14}, x_{12})$ and $p_7(x_{13}, x_{11})$ and $p_{12}(x_{13}, x_{14})) \Rightarrow p_{12}(x_{11}, x_{12})$ cnf(p12$_{24}$, negated_conjecture)
$(p_3(x_8, x_6)$ and $p_7(x_7, x_5)$ and $p_{11}(x_7, x_8)) \Rightarrow p_{11}(x_5, x_6)$ cnf(p11$_{25}$, negated_conjecture)
$(p_2(x_{26}, x_{28})$ and $p_2(x_{27}, x_{29})) \Rightarrow p_3(f_4(x_{26}, x_{27}), f_4(x_{28}, x_{29}))$ cnf(p3$_{26}$, negated_conjecture)
$p_{12}(c_{14}, f_4(x_9, c_{17})) \Rightarrow (p_{11}(c_{13}, f_4(c_{17}, f_6(x_9)))$ or $p_{11}(c_{13}, f_4(f_6(x_9), c_{17})))$ cnf(p11$_{27}$, negated_conjecture)

SYN593-1.p Harrison problem 3632
$p_{12}(x_0, x_0)$ cnf(p12$_1$, negated_conjecture)
$p_5(x_{37}, x_{37})$ cnf(p5$_2$, negated_conjecture)
$p_3(x_{24}, x_{24})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_{13}, x_{13})$ cnf(p2$_4$, negated_conjecture)
$\neg p_3(c_{21}, c_{19})$ cnf(not_p3$_5$, negated_conjecture)
$\neg p_{12}(f_{13}(c_{20}), f_{13}(c_{18}))$ cnf(not_p12$_6$, negated_conjecture)
$p_2(x_3, x_4) \Rightarrow p_{12}(f_{13}(x_3), f_{13}(x_4))$ cnf(p12$_7$, negated_conjecture)
$p_3(x_{42}, x_{43}) \Rightarrow p_5(f_7(x_{42}), f_7(x_{43}))$ cnf(p5$_8$, negated_conjecture)
$p_5(x_{40}, x_{41}) \Rightarrow p_5(f_{10}(x_{40}), f_{10}(x_{41}))$ cnf(p5$_9$, negated_conjecture)
$p_3(x_{35}, x_{36}) \Rightarrow p_3(f_9(x_{35}), f_9(x_{36}))$ cnf(p3$_{10}$, negated_conjecture)
$p_3(x_{33}, x_{34}) \Rightarrow p_3(f_8(x_{33}), f_8(x_{34}))$ cnf(p3$_{11}$, negated_conjecture)
$p_3(x_{27}, x_{28}) \Rightarrow p_3(f_{11}(x_{27}), f_{11}(x_{28}))$ cnf(p3$_{12}$, negated_conjecture)
$(p_{12}(x_0, x_1)$ and $p_{12}(x_0, x_2)) \Rightarrow p_{12}(x_1, x_2)$ cnf(p12$_{13}$, negated_conjecture)
$(p_5(x_{37}, x_{38})$ and $p_5(x_{37}, x_{39})) \Rightarrow p_5(x_{38}, x_{39})$ cnf(p5$_{14}$, negated_conjecture)
$(p_3(x_{24}, x_{25})$ and $p_3(x_{24}, x_{26})) \Rightarrow p_3(x_{25}, x_{26})$ cnf(p3$_{15}$, negated_conjecture)
$(p_2(x_{13}, x_{14})$ and $p_2(x_{13}, x_{15})) \Rightarrow p_2(x_{14}, x_{15})$ cnf(p2$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_9)$ and $p_2(x_{12}, x_{10})$ and $p_{15}(x_{11}, x_{12})) \Rightarrow p_{15}(x_9, x_{10})$ cnf(p15$_{17}$, negated_conjecture)
$p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), c_{19}), c_{20})$ cnf(p15$_{18}$, negated_conjecture)

$p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), c_{21}), c_{20})$ cnf(p15$_{19}$, negated_conjecture)
$(p_2(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32}))$ $\Rightarrow$ $p_3(f_{14}(x_{29}, x_{30}), f_{14}(x_{31}, x_{32}))$ cnf(p3$_{20}$, negated_conjecture)
$(p_2(x_{16}, x_{18})$ and $p_3(x_{17}, x_{19}))$ $\Rightarrow$ $p_2(f_4(x_{16}, x_{17}), f_4(x_{18}, x_{19}))$ cnf(p2$_{21}$, negated_conjecture)
$(p_2(x_{21}, x_{23})$ and $p_5(x_{20}, x_{22}))$ $\Rightarrow$ $p_2(f_6(x_{20}, x_{21}), f_6(x_{22}, x_{23}))$ cnf(p2$_{22}$, negated_conjecture)
$\neg\, p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{11}(c_{21})), c_{20})$ cnf(not_p15$_{23}$, negated_conjecture)
$\neg\, p_{15}(f_4(f_6(f_{10}(c_{16}), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{11}(c_{19})), c_{20})$ cnf(not_p15$_{24}$, negated_conjecture)
$p_{12}(f_{13}(x_5), f_{13}(c_{18}))$ or $p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{14}(x_5, x_6)), x_5)$ cnf(p12$_{25}$, negated_conjecture)
$p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), f_{11}(f_{14}(x_5, x_6))), x_5)$ $\Rightarrow$ $p_{12}(f_{13}(x_5), f_{13}(c_{18}))$ cnf(p12$_{26}$, negated_conjecture)
$(p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), x_7), x_5)$ and $p_{15}(f_4(f_6(f_{10}(x_6), f_6(f_7(f_8(f_9(c_{17}))), c_{18})), x_8), x_5))$ $\Rightarrow$ $(p_3(x_7, x_8)$ o

SYN594-1.p Harrison problem 3633
$p_2(x_{10}, x_{10})$ cnf(p2$_1$, negated_conjecture)
$p_7(x_{27}, x_{27})$ cnf(p7$_2$, negated_conjecture)
$\neg\, p_2(c_{16}, f_3(c_{17}))$ cnf(not_p2$_3$, negated_conjecture)
$p_{14}(c_{18}, f_3(f_4(f_5(c_{17}))))$ cnf(p14$_4$, negated_conjecture)
$p_{14}(x_4, x_5)$ $\Rightarrow$ $p_{15}(x_4, x_5)$ cnf(p15$_5$, negated_conjecture)
$p_{14}(x_4, x_5)$ $\Rightarrow$ $\neg\, p_2(x_4, x_5)$ cnf(not_p14$_6$, negated_conjecture)
$p_{14}(c_{19}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ cnf(p14$_7$, negated_conjecture)
$p_7(x_{36}, x_{37})$ $\Rightarrow$ $p_7(f_{12}(x_{36}), f_{12}(x_{37}))$ cnf(p7$_8$, negated_conjecture)
$p_2(x_{17}, x_{18})$ $\Rightarrow$ $p_2(f_3(x_{17}), f_3(x_{18}))$ cnf(p2$_9$, negated_conjecture)
$p_2(x_{19}, x_{20})$ $\Rightarrow$ $p_2(f_4(x_{19}), f_4(x_{20}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{21}, x_{22})$ $\Rightarrow$ $p_2(f_5(x_{21}), f_5(x_{22}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{34}, x_{35})$ $\Rightarrow$ $p_7(f_{11}(x_{34}), f_{11}(x_{35}))$ cnf(p7$_{12}$, negated_conjecture)
$p_{15}(x_4, x_5)$ $\Rightarrow$ $(p_{14}(x_4, x_5)$ or $p_2(x_4, x_5))$ cnf(p14$_{13}$, negated_conjecture)
$(p_7(x_{27}, x_{28})$ and $p_7(x_{27}, x_{29}))$ $\Rightarrow$ $p_7(x_{28}, x_{29})$ cnf(p7$_{14}$, negated_conjecture)
$(p_2(x_{10}, x_{11})$ and $p_2(x_{10}, x_{12}))$ $\Rightarrow$ $p_2(x_{11}, x_{12})$ cnf(p2$_{15}$, negated_conjecture)
$p_{15}(f_6(f_3(f_4(f_5(c_{17}))), f_{13}(c_{16}, f_3(f_5(c_{17})))), c_{19})$ cnf(p15$_{16}$, negated_conjecture)
$\neg\, p_2(c_{19}, f_6(f_3(f_4(f_5(c_{17}))), f_{13}(c_{16}, f_3(f_5(c_{17})))))$ cnf(not_p2$_{17}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{14}(x_2, x_3))$ $\Rightarrow$ $p_{14}(x_0, x_1)$ cnf(p14$_{18}$, negated_conjecture)
$(p_2(x_8, x_6)$ and $p_2(x_9, x_7)$ and $p_{15}(x_8, x_9))$ $\Rightarrow$ $p_{15}(x_6, x_7)$ cnf(p15$_{19}$, negated_conjecture)
$(p_2(x_{13}, x_{15})$ and $p_2(x_{14}, x_{16}))$ $\Rightarrow$ $p_2(f_{13}(x_{13}, x_{14}), f_{13}(x_{15}, x_{16}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_7(x_{42}, x_{44})$ and $p_7(x_{43}, x_{45}))$ $\Rightarrow$ $p_7(f_9(x_{42}, x_{43}), f_9(x_{44}, x_{45}))$ cnf(p7$_{21}$, negated_conjecture)
$(p_7(x_{38}, x_{40})$ and $p_7(x_{39}, x_{41}))$ $\Rightarrow$ $p_7(f_8(x_{38}, x_{39}), f_8(x_{40}, x_{41}))$ cnf(p7$_{22}$, negated_conjecture)
$(p_2(x_{31}, x_{33})$ and $p_7(x_{30}, x_{32}))$ $\Rightarrow$ $p_7(f_{10}(x_{30}, x_{31}), f_{10}(x_{32}, x_{33}))$ cnf(p7$_{23}$, negated_conjecture)
$(p_2(x_{23}, x_{25})$ and $p_2(x_{24}, x_{26}))$ $\Rightarrow$ $p_2(f_6(x_{23}, x_{24}), f_6(x_{25}, x_{26}))$ cnf(p2$_{24}$, negated_conjecture)
$p_7(c_{20}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{18}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{21}), f_9(f_{11}(c_{19}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))))$ cnf
$(p_2(x_{48}, f_3(c_{17}))$ and $p_{14}(x_{46}, f_3(f_4(f_5(c_{17}))))$ and $p_{15}(x_{47}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ $\Rightarrow$ $\neg\, p_7(c_{20}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))),$
$(p_{14}(x_{46}, f_3(f_4(f_5(c_{17}))))$ and $p_{15}(x_{47}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ and $p_{14}(f_6(f_3(f_4(f_5(c_{17}))), f_{13}(c_{16}, f_3(f_5(c_{17})))), x_{47}))$ $\Rightarrow$
$\neg\, p_7(c_{20}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), x_{46}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), x_{48}), f_9(f_{11}(x_{47}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))))$ c

SYN595-1.p Harrison problem 3634
$p_2(x_{10}, x_{10})$ cnf(p2$_1$, negated_conjecture)
$p_7(x_{27}, x_{27})$ cnf(p7$_2$, negated_conjecture)
$p_2(c_{21}, f_3(c_{17}))$ cnf(p2$_3$, negated_conjecture)
$\neg\, p_2(c_{16}, f_3(c_{17}))$ cnf(not_p2$_4$, negated_conjecture)
$p_{14}(c_{18}, f_3(f_4(f_5(c_{17}))))$ cnf(p14$_5$, negated_conjecture)
$p_{14}(x_4, x_5)$ $\Rightarrow$ $p_{15}(x_4, x_5)$ cnf(p15$_6$, negated_conjecture)
$p_{14}(x_4, x_5)$ $\Rightarrow$ $\neg\, p_2(x_4, x_5)$ cnf(not_p14$_7$, negated_conjecture)
$p_{14}(c_{19}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ cnf(p14$_8$, negated_conjecture)
$p_7(x_{36}, x_{37})$ $\Rightarrow$ $p_7(f_{12}(x_{36}), f_{12}(x_{37}))$ cnf(p7$_9$, negated_conjecture)
$p_2(x_{17}, x_{18})$ $\Rightarrow$ $p_2(f_3(x_{17}), f_3(x_{18}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{19}, x_{20})$ $\Rightarrow$ $p_2(f_4(x_{19}), f_4(x_{20}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{21}, x_{22})$ $\Rightarrow$ $p_2(f_5(x_{21}), f_5(x_{22}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{34}, x_{35})$ $\Rightarrow$ $p_7(f_{11}(x_{34}), f_{11}(x_{35}))$ cnf(p7$_{13}$, negated_conjecture)
$p_{15}(x_4, x_5)$ $\Rightarrow$ $(p_{14}(x_4, x_5)$ or $p_2(x_4, x_5))$ cnf(p14$_{14}$, negated_conjecture)
$(p_7(x_{27}, x_{28})$ and $p_7(x_{27}, x_{29}))$ $\Rightarrow$ $p_7(x_{28}, x_{29})$ cnf(p7$_{15}$, negated_conjecture)
$(p_2(x_{10}, x_{11})$ and $p_2(x_{10}, x_{12}))$ $\Rightarrow$ $p_2(x_{11}, x_{12})$ cnf(p2$_{16}$, negated_conjecture)
$p_2(c_{19}, f_6(f_3(f_4(f_5(c_{17}))), f_{13}(c_{16}, f_3(f_5(c_{17})))))$ cnf(p2$_{17}$, negated_conjecture)
$(p_2(x_2, x_0)$ and $p_2(x_3, x_1)$ and $p_{14}(x_2, x_3))$ $\Rightarrow$ $p_{14}(x_0, x_1)$ cnf(p14$_{18}$, negated_conjecture)
$(p_2(x_8, x_6)$ and $p_2(x_9, x_7)$ and $p_{15}(x_8, x_9))$ $\Rightarrow$ $p_{15}(x_6, x_7)$ cnf(p15$_{19}$, negated_conjecture)

$(p_2(x_{13}, x_{15})$ and $p_2(x_{14}, x_{16})) \Rightarrow p_2(f_{13}(x_{13}, x_{14}), f_{13}(x_{15}, x_{16}))$ cnf(p2_{20}, negated_conjecture)
$(p_7(x_{42}, x_{44})$ and $p_7(x_{43}, x_{45})) \Rightarrow p_7(f_9(x_{42}, x_{43}), f_9(x_{44}, x_{45}))$ cnf(p7_{21}, negated_conjecture)
$(p_7(x_{38}, x_{40})$ and $p_7(x_{39}, x_{41})) \Rightarrow p_7(f_8(x_{38}, x_{39}), f_8(x_{40}, x_{41}))$ cnf(p7_{22}, negated_conjecture)
$(p_2(x_{31}, x_{33})$ and $p_7(x_{30}, x_{32})) \Rightarrow p_7(f_{10}(x_{30}, x_{31}), f_{10}(x_{32}, x_{33}))$ cnf(p7_{23}, negated_conjecture)
$(p_2(x_{23}, x_{25})$ and $p_2(x_{24}, x_{26})) \Rightarrow p_2(f_6(x_{23}, x_{24}), f_6(x_{25}, x_{26}))$ cnf(p2_{24}, negated_conjecture)
$p_7(c_{20}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{18}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{21}), f_9(f_{11}(c_{19}), f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), c_{22})))))$ cnf
$(p_2(x_{48}, f_3(c_{17}))$ and $p_{14}(x_{46}, f_3(f_4(f_5(c_{17}))))$ and $p_{15}(x_{47}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))) \Rightarrow \neg p_7(f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{18})$
$(p_{14}(x_{46}, f_3(f_4(f_5(c_{17}))))$ and $p_{15}(x_{47}, f_6(f_3(f_4(f_5(c_{17}))), c_{16}))$ and $p_{14}(f_6(f_3(f_4(f_5(c_{17})))), f_{13}(c_{16}, f_3(f_5(c_{17})))), x_{47})) \Rightarrow$
$\neg p_7(f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{17})))), c_{18}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{17})))), f_3(c_{17})), f_9(f_{11}(f_6(f_3(f_4(f_5(c_{17})))), f_{13}(c_{16}, f_3(f_5(c_{17}))))), f$

SYN596-1.p Harrison problem 3669

$p_{10}(x_0, x_0)$ cnf(p10_1, negated_conjecture)
$p_9(x_{50}, x_{50})$ cnf(p9_2, negated_conjecture)
$p_3(x_{35}, x_{35})$ cnf(p3_3, negated_conjecture)
$p_2(x_{28}, x_{28})$ cnf(p2_4, negated_conjecture)
$p_{12}(x_9, x_9)$ cnf(p12_5, negated_conjecture)
$p_{16}(c_{21}, c_{22})$ cnf(p16_6, negated_conjecture)
$p_{17}(c_{21}, f_8(c_{20}))$ cnf(p17_7, negated_conjecture)
$p_{16}(f_5(f_6(f_7(c_{19}))), f_4(c_{20}))$ cnf(p16_8, negated_conjecture)
$p_2(x_{48}, x_{49}) \Rightarrow p_3(f_8(x_{48}), f_8(x_{49}))$ cnf(p3_9, negated_conjecture)
$p_2(x_{38}, x_{39}) \Rightarrow p_3(f_{15}(x_{38}), f_{15}(x_{39}))$ cnf(p3_{10}, negated_conjecture)
$p_2(x_{40}, x_{41}) \Rightarrow p_3(f_4(x_{40}), f_4(x_{41}))$ cnf(p3_{11}, negated_conjecture)
$p_3(x_{42}, x_{43}) \Rightarrow p_3(f_5(x_{42}), f_5(x_{43}))$ cnf(p3_{12}, negated_conjecture)
$p_3(x_{44}, x_{45}) \Rightarrow p_3(f_6(x_{44}), f_6(x_{45}))$ cnf(p3_{13}, negated_conjecture)
$p_3(x_{46}, x_{47}) \Rightarrow p_3(f_7(x_{46}), f_7(x_{47}))$ cnf(p3_{14}, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10_{15}, negated_conjecture)
$(p_9(x_{50}, x_{51})$ and $p_9(x_{50}, x_{52})) \Rightarrow p_9(x_{51}, x_{52})$ cnf(p9_{16}, negated_conjecture)
$(p_3(x_{35}, x_{36})$ and $p_3(x_{35}, x_{37})) \Rightarrow p_3(x_{36}, x_{37})$ cnf(p3_{17}, negated_conjecture)
$(p_2(x_{28}, x_{29})$ and $p_2(x_{28}, x_{30})) \Rightarrow p_2(x_{29}, x_{30})$ cnf(p2_{18}, negated_conjecture)
$(p_{12}(x_9, x_{10})$ and $p_{12}(x_9, x_{11})) \Rightarrow p_{12}(x_{10}, x_{11})$ cnf(p12_{19}, negated_conjecture)
$p_{18}(c_{20}, f_{11}(f_{13}(f_{15}(c_{20}), f_{14}(f_4(c_{20}), c_{21})), c_{23}, c_{24}))$ cnf(p18_{20}, negated_conjecture)
$\neg p_{18}(c_{20}, f_{11}(f_{13}(f_{15}(c_{20}), f_{14}(f_4(c_{20}), c_{22})), c_{23}, c_{24}))$ cnf(not_p18_{21}, negated_conjecture)
$(p_3(x_{18}, x_{16})$ and $p_3(x_{19}, x_{17})$ and $p_{16}(x_{18}, x_{19})) \Rightarrow p_{16}(x_{16}, x_{17})$ cnf(p16_{22}, negated_conjecture)
$(p_{18}(x_{27}, x_{26})$ and $p_2(x_{27}, x_{24})$ and $p_{10}(x_{26}, x_{25})) \Rightarrow p_{18}(x_{24}, x_{25})$ cnf(p18_{23}, negated_conjecture)
$(p_3(x_{22}, x_{20})$ and $p_3(x_{23}, x_{21})$ and $p_{17}(x_{22}, x_{23})) \Rightarrow p_{17}(x_{20}, x_{21})$ cnf(p17_{24}, negated_conjecture)
$(p_{12}(x_{32}, x_{34})$ and $p_3(x_{31}, x_{33})) \Rightarrow p_2(f_{13}(x_{31}, x_{32}), f_{13}(x_{33}, x_{34}))$ cnf(p2_{25}, negated_conjecture)
$(p_3(x_{12}, x_{14})$ and $p_3(x_{13}, x_{15})) \Rightarrow p_{12}(f_{14}(x_{12}, x_{13}), f_{14}(x_{14}, x_{15}))$ cnf(p12_{26}, negated_conjecture)
$(p_2(x_3, x_6)$ and $p_9(x_4, x_7)$ and $p_{10}(x_5, x_8)) \Rightarrow p_{10}(f_{11}(x_3, x_4, x_5), f_{11}(x_6, x_7, x_8))$ cnf(p10_{27}, negated_conjecture)
$p_{10}(f_{11}(f_{13}(f_{15}(c_{20}), f_{14}(f_4(c_{20}), c_{22})), c_{23}, c_{24}), f_{11}(f_{13}(f_{15}(c_{20}), f_{14}(f_4(c_{20}), c_{21})), c_{23}, c_{24}))$ cnf(p10_{28}, negated_conjecture)

SYN597-1.p Harrison problem 3670

$p_{10}(x_0, x_0)$ cnf(p10_1, negated_conjecture)
$p_9(x_{50}, x_{50})$ cnf(p9_2, negated_conjecture)
$p_3(x_{35}, x_{35})$ cnf(p3_3, negated_conjecture)
$p_2(x_{28}, x_{28})$ cnf(p2_4, negated_conjecture)
$p_{12}(x_9, x_9)$ cnf(p12_5, negated_conjecture)
$p_{16}(c_{21}, c_{22})$ cnf(p16_6, negated_conjecture)
$p_3(c_{21}, c_{22})$ cnf(p3_7, negated_conjecture)
$p_{17}(c_{21}, f_8(c_{20}))$ cnf(p17_8, negated_conjecture)
$p_{16}(f_5(f_6(f_7(c_{19}))), f_4(c_{20}))$ cnf(p16_9, negated_conjecture)
$p_2(x_{48}, x_{49}) \Rightarrow p_3(f_8(x_{48}), f_8(x_{49}))$ cnf(p3_{10}, negated_conjecture)
$p_2(x_{38}, x_{39}) \Rightarrow p_3(f_{15}(x_{38}), f_{15}(x_{39}))$ cnf(p3_{11}, negated_conjecture)
$p_2(x_{40}, x_{41}) \Rightarrow p_3(f_4(x_{40}), f_4(x_{41}))$ cnf(p3_{12}, negated_conjecture)
$p_3(x_{42}, x_{43}) \Rightarrow p_3(f_5(x_{42}), f_5(x_{43}))$ cnf(p3_{13}, negated_conjecture)
$p_3(x_{44}, x_{45}) \Rightarrow p_3(f_6(x_{44}), f_6(x_{45}))$ cnf(p3_{14}, negated_conjecture)
$p_3(x_{46}, x_{47}) \Rightarrow p_3(f_7(x_{46}), f_7(x_{47}))$ cnf(p3_{15}, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10_{16}, negated_conjecture)
$(p_9(x_{50}, x_{51})$ and $p_9(x_{50}, x_{52})) \Rightarrow p_9(x_{51}, x_{52})$ cnf(p9_{17}, negated_conjecture)
$(p_3(x_{35}, x_{36})$ and $p_3(x_{35}, x_{37})) \Rightarrow p_3(x_{36}, x_{37})$ cnf(p3_{18}, negated_conjecture)
$(p_2(x_{28}, x_{29})$ and $p_2(x_{28}, x_{30})) \Rightarrow p_2(x_{29}, x_{30})$ cnf(p2_{19}, negated_conjecture)

$(p_{12}(x_9, x_{10})$ and $p_{12}(x_9, x_{11})) \Rightarrow p_{12}(x_{10}, x_{11})$ cnf(p12$_{20}$, negated_conjecture)
$p_{18}(c_{20}, f_{11}(f_{13}(f_{15}(c_{20}), f_{14}(f_4(c_{20}), c_{21})), c_{23}, c_{24}))$ cnf(p18$_{21}$, negated_conjecture)
$\neg p_{18}(c_{20}, f_{11}(f_{13}(f_{15}(c_{20}), f_{14}(f_4(c_{20}), c_{22})), c_{23}, c_{24}))$ cnf(not_p18$_{22}$, negated_conjecture)
$(p_3(x_{18}, x_{16})$ and $p_3(x_{19}, x_{17})$ and $p_{16}(x_{18}, x_{19})) \Rightarrow p_{16}(x_{16}, x_{17})$ cnf(p16$_{23}$, negated_conjecture)
$(p_{18}(x_{27}, x_{26})$ and $p_2(x_{27}, x_{24})$ and $p_{10}(x_{26}, x_{25})) \Rightarrow p_{18}(x_{24}, x_{25})$ cnf(p18$_{24}$, negated_conjecture)
$(p_3(x_{22}, x_{20})$ and $p_3(x_{23}, x_{21})$ and $p_{17}(x_{22}, x_{23})) \Rightarrow p_{17}(x_{20}, x_{21})$ cnf(p17$_{25}$, negated_conjecture)
$(p_{12}(x_{32}, x_{34})$ and $p_3(x_{31}, x_{33})) \Rightarrow p_2(f_{13}(x_{31}, x_{32}), f_{13}(x_{33}, x_{34}))$ cnf(p2$_{26}$, negated_conjecture)
$(p_3(x_{12}, x_{14})$ and $p_3(x_{13}, x_{15})) \Rightarrow p_{12}(f_{14}(x_{12}, x_{13}), f_{14}(x_{14}, x_{15}))$ cnf(p12$_{27}$, negated_conjecture)
$(p_2(x_3, x_6)$ and $p_9(x_4, x_7)$ and $p_{10}(x_5, x_8)) \Rightarrow p_{10}(f_{11}(x_3, x_4, x_5), f_{11}(x_6, x_7, x_8))$ cnf(p10$_{28}$, negated_conjecture)

SYN598-1.p Harrison problem 3756
$p_{17}(c_{21})$ cnf(c21_is_p17$_1$, negated_conjecture)
$p_{18}(c_{21})$ cnf(c21_is_p18$_2$, negated_conjecture)
$p_7(x_{34}, x_{34})$ cnf(p7$_3$, negated_conjecture)
$p_2(x_9, x_9)$ cnf(p2$_4$, negated_conjecture)
$p_3(x_{18}, x_{18})$ cnf(p3$_5$, negated_conjecture)
$p_5(x_{31}, x_{31})$ cnf(p5$_6$, negated_conjecture)
$p_3(f_4(f_6(c_{21})), c_{22})$ cnf(p3$_7$, negated_conjecture)
$(p_{17}(x_1)$ and $p_5(x_1, x_0)) \Rightarrow p_{17}(x_0)$ cnf(p17$_8$, negated_conjecture)
$(p_{18}(x_3)$ and $p_5(x_3, x_2)) \Rightarrow p_{18}(x_2)$ cnf(p18$_9$, negated_conjecture)
$p_5(x_{49}, x_{50}) \Rightarrow p_7(f_9(x_{49}), f_9(x_{50}))$ cnf(p7$_{10}$, negated_conjecture)
$p_5(x_{12}, x_{13}) \Rightarrow p_2(f_6(x_{12}), f_6(x_{13}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{21}, x_{22}) \Rightarrow p_3(f_{12}(x_{21}), f_{12}(x_{22}))$ cnf(p3$_{12}$, negated_conjecture)
$p_3(x_{23}, x_{24}) \Rightarrow p_3(f_{13}(x_{23}), f_{13}(x_{24}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{25}, x_{26}) \Rightarrow p_3(f_{15}(x_{25}), f_{15}(x_{26}))$ cnf(p3$_{14}$, negated_conjecture)
$p_3(x_{27}, x_{28}) \Rightarrow p_3(f_{16}(x_{27}), f_{16}(x_{28}))$ cnf(p3$_{15}$, negated_conjecture)
$p_2(x_{29}, x_{30}) \Rightarrow p_3(f_4(x_{29}), f_4(x_{30}))$ cnf(p3$_{16}$, negated_conjecture)
$p_3(x_{45}, x_{46}) \Rightarrow p_7(f_{14}(x_{45}), f_{14}(x_{46}))$ cnf(p7$_{17}$, negated_conjecture)
$p_7(x_{47}, x_{48}) \Rightarrow p_7(f_8(x_{47}), f_8(x_{48}))$ cnf(p7$_{18}$, negated_conjecture)
$(p_2(x_9, x_{10})$ and $p_2(x_9, x_{11})) \Rightarrow p_2(x_{10}, x_{11})$ cnf(p2$_{19}$, negated_conjecture)
$(p_7(x_{34}, x_{35})$ and $p_7(x_{34}, x_{36})) \Rightarrow p_7(x_{35}, x_{36})$ cnf(p7$_{20}$, negated_conjecture)
$(p_5(x_{31}, x_{32})$ and $p_5(x_{31}, x_{33})) \Rightarrow p_5(x_{32}, x_{33})$ cnf(p5$_{21}$, negated_conjecture)
$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \Rightarrow p_3(x_{19}, x_{20})$ cnf(p3$_{22}$, negated_conjecture)
$(p_7(x_6, x_4)$ and $p_7(x_7, x_5)$ and $p_{19}(x_6, x_7)) \Rightarrow p_{19}(x_4, x_5)$ cnf(p19$_{23}$, negated_conjecture)
$(p_7(x_{16}, x_{14})$ and $p_7(x_{17}, x_{15})$ and $p_{20}(x_{16}, x_{17})) \Rightarrow p_{20}(x_{14}, x_{15})$ cnf(p20$_{24}$, negated_conjecture)
$(p_3(x_{42}, x_{44})$ and $p_7(x_{41}, x_{43})) \Rightarrow p_7(f_{11}(x_{41}, x_{42}), f_{11}(x_{43}, x_{44}))$ cnf(p7$_{25}$, negated_conjecture)
$(p_7(x_{38}, x_{40})$ and $p_7(x_{37}, x_{39})) \Rightarrow p_7(f_{10}(x_{37}, x_{38}), f_{10}(x_{39}, x_{40}))$ cnf(p7$_{26}$, negated_conjecture)
$\neg p_{19}(f_{10}(f_{11}(f_{14}(f_{12}(f_{15}(f_{13}(c_{23})))), c_{22}), f_{11}(f_{14}(f_{12}(f_{15}(f_{13}(c_{23})))), f_{12}(f_{13}(f_{13}(f_{13}(f_{13}(f_{13}(f_{13}(f_{13}(c_{23}))))))))), f_8(f_9(c_{21}))$
$p_{18}(x_8) \Rightarrow p_{19}(f_{10}(f_{11}(f_{14}(f_{12}(f_{15}(f_{13}(c_{23})))), f_4(f_6(x_8))), f_{11}(f_{14}(f_{12}(f_{15}(f_{13}(c_{23})))), f_{12}(f_{13}(f_{13}(f_{13}(f_{13}(f_{13}(f_{13}(c_{23}))))$
$p_{18}(x_8) \Rightarrow p_{20}(f_8(f_9(x_8)), f_{10}(f_{11}(f_{14}(f_{12}(f_{15}(f_{13}(c_{23})))), f_{16}(f_4(f_6(x_8)))), f_{11}(f_{14}(f_{12}(f_{15}(f_{13}(c_{23})))), f_{12}(f_{13}(f_{13}(f_{13}(f_{13}(f_1$

SYN599-1.p Harrison problem 3757
$p_{17}(c_{21})$ cnf(c21_is_p17$_1$, negated_conjecture)
$p_{18}(c_{21})$ cnf(c21_is_p18$_2$, negated_conjecture)
$p_7(x_{34}, x_{34})$ cnf(p7$_3$, negated_conjecture)
$p_2(x_9, x_9)$ cnf(p2$_4$, negated_conjecture)
$p_3(x_{18}, x_{18})$ cnf(p3$_5$, negated_conjecture)
$p_5(x_{31}, x_{31})$ cnf(p5$_6$, negated_conjecture)
$p_3(f_4(f_6(c_{21})), c_{22})$ cnf(p3$_7$, negated_conjecture)
$(p_{17}(x_1)$ and $p_5(x_1, x_0)) \Rightarrow p_{17}(x_0)$ cnf(p17$_8$, negated_conjecture)
$(p_{18}(x_3)$ and $p_5(x_3, x_2)) \Rightarrow p_{18}(x_2)$ cnf(p18$_9$, negated_conjecture)
$p_5(x_{41}, x_{42}) \Rightarrow p_7(f_{16}(x_{41}), f_{16}(x_{42}))$ cnf(p7$_{10}$, negated_conjecture)
$p_5(x_{12}, x_{13}) \Rightarrow p_2(f_6(x_{12}), f_6(x_{13}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{21}, x_{22}) \Rightarrow p_3(f_{10}(x_{21}), f_{10}(x_{22}))$ cnf(p3$_{12}$, negated_conjecture)
$p_3(x_{23}, x_{24}) \Rightarrow p_3(f_{11}(x_{23}), f_{11}(x_{24}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{25}, x_{26}) \Rightarrow p_3(f_{13}(x_{25}), f_{13}(x_{26}))$ cnf(p3$_{14}$, negated_conjecture)
$p_3(x_{27}, x_{28}) \Rightarrow p_3(f_{14}(x_{27}), f_{14}(x_{28}))$ cnf(p3$_{15}$, negated_conjecture)
$p_2(x_{29}, x_{30}) \Rightarrow p_3(f_4(x_{29}), f_4(x_{30}))$ cnf(p3$_{16}$, negated_conjecture)
$p_3(x_{37}, x_{38}) \Rightarrow p_7(f_{12}(x_{37}), f_{12}(x_{38}))$ cnf(p7$_{17}$, negated_conjecture)
$p_7(x_{39}, x_{40}) \Rightarrow p_7(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p7$_{18}$, negated_conjecture)

$(p_2(x_9, x_{10})$ and $p_2(x_9, x_{11})) \Rightarrow p_2(x_{10}, x_{11})$ cnf(p2$_{19}$, negated_conjecture)
$(p_7(x_{34}, x_{35})$ and $p_7(x_{34}, x_{36})) \Rightarrow p_7(x_{35}, x_{36})$ cnf(p7$_{20}$, negated_conjecture)
$(p_5(x_{31}, x_{32})$ and $p_5(x_{31}, x_{33})) \Rightarrow p_5(x_{32}, x_{33})$ cnf(p5$_{21}$, negated_conjecture)
$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \Rightarrow p_3(x_{19}, x_{20})$ cnf(p3$_{22}$, negated_conjecture)
$(p_7(x_6, x_4)$ and $p_7(x_7, x_5)$ and $p_{19}(x_6, x_7)) \Rightarrow p_{19}(x_4, x_5)$ cnf(p19$_{23}$, negated_conjecture)
$(p_7(x_{16}, x_{14})$ and $p_7(x_{17}, x_{15})$ and $p_{20}(x_{16}, x_{17})) \Rightarrow p_{20}(x_{14}, x_{15})$ cnf(p20$_{24}$, negated_conjecture)
$(p_3(x_{48}, x_{50})$ and $p_7(x_{47}, x_{49})) \Rightarrow p_7(f_9(x_{47}, x_{48}), f_9(x_{49}, x_{50}))$ cnf(p7$_{25}$, negated_conjecture)
$(p_7(x_{43}, x_{45})$ and $p_7(x_{44}, x_{46})) \Rightarrow p_7(f_8(x_{43}, x_{44}), f_8(x_{45}, x_{46}))$ cnf(p7$_{26}$, negated_conjecture)
$\neg p_{19}(f_{15}(f_{16}(c_{21})), f_8(f_9(f_{12}(f_{10}(f_{13}(f_{11}(c_{23})))), f_{14}(c_{22})), f_9(f_{12}(f_{10}(f_{13}(f_{11}(c_{23})))), f_{10}(f_{11}(f_{11}(f_{11}(f_{11}(f_{11}(f_{11}(c_{23}))))$
$p_{18}(x_8) \Rightarrow p_{20}(f_8(f_9(f_{12}(f_{10}(f_{13}(f_{11}(c_{23})))), f_4(f_6(x_8))), f_9(f_{12}(f_{10}(f_{13}(f_{11}(c_{23})))), f_{10}(f_{11}(f_{11}(f_{11}(f_{11}(f_{11}(f_{11}(c_{23}))))$
$p_{18}(x_8) \Rightarrow p_{19}(f_{15}(f_{16}(x_8)), f_8(f_9(f_{12}(f_{10}(f_{13}(f_{11}(c_{23})))), f_{14}(f_4(f_6(x_8)))), f_9(f_{12}(f_{10}(f_{13}(f_{11}(c_{23})))), f_{10}(f_{11}(f_{11}(f_{11}(f_{11}(f_{11}$

SYN600-1.p Harrison problem 3759
$p_{19}(c_{21})$ cnf(c21_is_p19$_1$, negated_conjecture)
$p_{19}(c_{22})$ cnf(c22_is_p19$_2$, negated_conjecture)
$p_2(x_{11}, x_{11})$ cnf(p2$_3$, negated_conjecture)
$p_7(x_{32}, x_{32})$ cnf(p7$_4$, negated_conjecture)
$p_5(x_{29}, x_{29})$ cnf(p5$_5$, negated_conjecture)
$p_3(x_{16}, x_{16})$ cnf(p3$_6$, negated_conjecture)
$p_7(f_{16}(c_{21}), f_{16}(c_{22}))$ cnf(p7$_7$, negated_conjecture)
$\neg p_3(f_4(f_6(c_{21})), f_4(f_6(c_{22})))$ cnf(not_p3$_8$, negated_conjecture)
$(p_{19}(x_{10})$ and $p_5(x_{10}, x_9)) \Rightarrow p_{19}(x_9)$ cnf(p19$_9$, negated_conjecture)
$p_5(x_{43}, x_{44}) \Rightarrow p_7(f_{16}(x_{43}), f_{16}(x_{44}))$ cnf(p7$_{10}$, negated_conjecture)
$p_5(x_{14}, x_{15}) \Rightarrow p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{19}, x_{20}) \Rightarrow p_3(f_{11}(x_{19}), f_{11}(x_{20}))$ cnf(p3$_{12}$, negated_conjecture)
$p_3(x_{21}, x_{22}) \Rightarrow p_3(f_{12}(x_{21}), f_{12}(x_{22}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{23}, x_{24}) \Rightarrow p_3(f_{14}(x_{23}), f_{14}(x_{24}))$ cnf(p3$_{14}$, negated_conjecture)
$p_2(x_{25}, x_{26}) \Rightarrow p_3(f_4(x_{25}), f_4(x_{26}))$ cnf(p3$_{15}$, negated_conjecture)
$p_3(x_{39}, x_{40}) \Rightarrow p_7(f_{13}(x_{39}), f_{13}(x_{40}))$ cnf(p7$_{16}$, negated_conjecture)
$p_7(x_{41}, x_{42}) \Rightarrow p_7(f_{15}(x_{41}), f_{15}(x_{42}))$ cnf(p7$_{17}$, negated_conjecture)
$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(x_{12}, x_{13})$ cnf(p2$_{18}$, negated_conjecture)
$(p_7(x_{32}, x_{33})$ and $p_7(x_{32}, x_{34})) \Rightarrow p_7(x_{33}, x_{34})$ cnf(p7$_{19}$, negated_conjecture)
$(p_5(x_{29}, x_{30})$ and $p_5(x_{29}, x_{31})) \Rightarrow p_5(x_{30}, x_{31})$ cnf(p5$_{20}$, negated_conjecture)
$(p_3(x_{16}, x_{17})$ and $p_3(x_{16}, x_{18})) \Rightarrow p_3(x_{17}, x_{18})$ cnf(p3$_{21}$, negated_conjecture)
$(p_7(x_2, x_0)$ and $p_7(x_3, x_1)$ and $p_{17}(x_2, x_3)) \Rightarrow p_{17}(x_0, x_1)$ cnf(p17$_{22}$, negated_conjecture)
$(p_7(x_7, x_5)$ and $p_7(x_8, x_6)$ and $p_{18}(x_7, x_8)) \Rightarrow p_{18}(x_5, x_6)$ cnf(p18$_{23}$, negated_conjecture)
$(p_7(x_{50}, x_{52})$ and $p_7(x_{49}, x_{51})) \Rightarrow p_7(f_9(x_{49}, x_{50}), f_9(x_{51}, x_{52}))$ cnf(p7$_{24}$, negated_conjecture)
$(p_3(x_{36}, x_{38})$ and $p_7(x_{35}, x_{37})) \Rightarrow p_7(f_{10}(x_{35}, x_{36}), f_{10}(x_{37}, x_{38}))$ cnf(p7$_{25}$, negated_conjecture)
$(p_7(x_{45}, x_{47})$ and $p_7(x_{46}, x_{48})) \Rightarrow p_7(f_8(x_{45}, x_{46}), f_8(x_{47}, x_{48}))$ cnf(p7$_{26}$, negated_conjecture)
$p_{19}(x_4) \Rightarrow p_{18}(f_9(f_{10}(f_{13}(f_{11}(f_{14}(f_{12}(c_{20})))), f_4(f_6(x_4))), f_{10}(f_{13}(f_{11}(f_{14}(f_{12}(c_{20})))), f_{11}(f_{12}(f_{12}(f_{12}(f_{12}(f_{12}(f_{12}(f_{12}(c_{20}))))$
$p_{19}(x_4) \Rightarrow p_{17}(f_{15}(f_{16}(x_4)), f_8(f_{13}(f_{11}(f_{14}(f_{12}(c_{20}))))), f_9(f_{10}(f_{13}(f_{11}(f_{14}(f_{12}(c_{20}))))), f_4(f_6(x_4))), f_{10}(f_{13}(f_{11}(f_{14}(f_{12}(c_{20})))),$
$(p_{19}(x_{27})$ and $p_{18}(f_9(f_{10}(f_{13}(f_{11}(f_{14}(f_{12}(c_{20}))))), x_{28}), f_{10}(f_{13}(f_{11}(f_{14}(f_{12}(c_{20}))))), f_{11}(f_{12}(f_{12}(f_{12}(f_{12}(f_{12}(f_{12}(f_{12}(c_{20}))))))))))$
$p_3(f_4(f_6(x_{27})), x_{28})$ cnf(p3$_{29}$, negated_conjecture)

SYN601-1.p Harrison problem 3799
$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_9(x_{52}, x_{52})$ cnf(p9$_2$, negated_conjecture)
$p_3(x_{37}, x_{37})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_{30}, x_{30})$ cnf(p2$_4$, negated_conjecture)
$p_{12}(x_{11}, x_{11})$ cnf(p12$_5$, negated_conjecture)
$p_{17}(c_{22}, c_{23})$ cnf(p17$_6$, negated_conjecture)
$p_3(c_{22}, c_{23})$ cnf(p3$_7$, negated_conjecture)
$p_{18}(c_{22}, f_8(c_{21}))$ cnf(p18$_8$, negated_conjecture)
$p_{17}(f_5(f_6(f_7(c_{20}))), f_4(c_{21}))$ cnf(p17$_9$, negated_conjecture)
$p_2(x_{50}, x_{51}) \Rightarrow p_3(f_8(x_{50}), f_8(x_{51}))$ cnf(p3$_{10}$, negated_conjecture)
$p_3(x_9, x_{10}) \Rightarrow p_{10}(f_{16}(x_9), f_{16}(x_{10}))$ cnf(p10$_{11}$, negated_conjecture)
$p_2(x_{40}, x_{41}) \Rightarrow p_3(f_{15}(x_{40}), f_{15}(x_{41}))$ cnf(p3$_{12}$, negated_conjecture)
$p_2(x_{42}, x_{43}) \Rightarrow p_3(f_4(x_{42}), f_4(x_{43}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{44}, x_{45}) \Rightarrow p_3(f_5(x_{44}), f_5(x_{45}))$ cnf(p3$_{14}$, negated_conjecture)
$p_3(x_{46}, x_{47}) \Rightarrow p_3(f_6(x_{46}), f_6(x_{47}))$ cnf(p3$_{15}$, negated_conjecture)

$p_3(x_{48}, x_{49}) \Rightarrow p_3(f_7(x_{48}), f_7(x_{49}))$ cnf(p3$_{16}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{17}$, negated_conjecture)
$(p_9(x_{52}, x_{53})$ and $p_9(x_{52}, x_{54})) \Rightarrow p_9(x_{53}, x_{54})$ cnf(p9$_{18}$, negated_conjecture)
$(p_3(x_{37}, x_{38})$ and $p_3(x_{37}, x_{39})) \Rightarrow p_3(x_{38}, x_{39})$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_{30}, x_{31})$ and $p_2(x_{30}, x_{32})) \Rightarrow p_2(x_{31}, x_{32})$ cnf(p2$_{20}$, negated_conjecture)
$(p_{12}(x_{11}, x_{12})$ and $p_{12}(x_{11}, x_{13})) \Rightarrow p_{12}(x_{12}, x_{13})$ cnf(p12$_{21}$, negated_conjecture)
$p_{19}(c_{21}, f_{11}(f_{13}(f_{15}(c_{21}), f_{14}(f_4(c_{21}), c_{22})), c_{24}, c_{25}))$ cnf(p19$_{22}$, negated_conjecture)
$\neg p_{19}(c_{21}, f_{11}(f_{13}(f_{15}(c_{21}), f_{14}(f_4(c_{21}), c_{23})), c_{24}, c_{25}))$ cnf(not_p19$_{23}$, negated_conjecture)
$(p_{19}(x_{29}, x_{28})$ and $p_2(x_{29}, x_{26})$ and $p_{10}(x_{28}, x_{27})) \Rightarrow p_{19}(x_{26}, x_{27})$ cnf(p19$_{24}$, negated_conjecture)
$(p_3(x_{20}, x_{18})$ and $p_3(x_{21}, x_{19})$ and $p_{17}(x_{20}, x_{21})) \Rightarrow p_{17}(x_{18}, x_{19})$ cnf(p17$_{25}$, negated_conjecture)
$(p_3(x_{24}, x_{22})$ and $p_3(x_{25}, x_{23})$ and $p_{18}(x_{24}, x_{25})) \Rightarrow p_{18}(x_{22}, x_{23})$ cnf(p18$_{26}$, negated_conjecture)
$(p_3(x_{14}, x_{16})$ and $p_3(x_{15}, x_{17})) \Rightarrow p_{12}(f_{14}(x_{14}, x_{15}), f_{14}(x_{16}, x_{17}))$ cnf(p12$_{27}$, negated_conjecture)
$(p_{12}(x_{34}, x_{36})$ and $p_3(x_{33}, x_{35})) \Rightarrow p_2(f_{13}(x_{33}, x_{34}), f_{13}(x_{35}, x_{36}))$ cnf(p2$_{28}$, negated_conjecture)
$\neg p_{10}(f_{11}(f_{13}(f_{15}(c_{21}), f_{14}(f_4(c_{21}), c_{23})), c_{24}, c_{25}), f_{16}(f_5(c_{20})))$ cnf(not_p10$_{29}$, negated_conjecture)
$(p_2(x_3, x_6)$ and $p_9(x_4, x_7)$ and $p_{10}(x_5, x_8)) \Rightarrow p_{10}(f_{11}(x_3, x_4, x_5), f_{11}(x_6, x_7, x_8))$ cnf(p10$_{30}$, negated_conjecture)

SYN602-1.p Harrison problem 3811
$p_{14}(c_{20})$ cnf(c20_is_p14$_1$, negated_conjecture)
$p_2(x_{18}, x_{18})$ cnf(p2$_2$, negated_conjecture)
$p_{15}(c_{22}, c_{21})$ cnf(p15$_3$, negated_conjecture)
$p_2(f_3(c_{18}), c_{19})$ cnf(p2$_4$, negated_conjecture)
$p_2(c_{22}, f_9(c_{20}, c_{23}))$ cnf(p2$_5$, negated_conjecture)
$p_2(f_3(f_4(c_{16})), c_{17})$ cnf(p2$_6$, negated_conjecture)
$(p_{14}(x_{12})$ and $p_2(x_{12}, x_{11})) \Rightarrow p_{14}(x_{11})$ cnf(p14$_7$, negated_conjecture)
$p_{13}(x_{17}, f_5(c_{18})) \Rightarrow p_{15}(f_{10}(x_{17}), c_{21})$ cnf(p15$_8$, negated_conjecture)
$p_2(x_{35}, x_{36}) \Rightarrow p_2(f_5(x_{35}), f_5(x_{36}))$ cnf(p2$_9$, negated_conjecture)
$p_2(x_{27}, x_{28}) \Rightarrow p_2(f_{10}(x_{27}), f_{10}(x_{28}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{29}, x_{30}) \Rightarrow p_2(f_{11}(x_{29}), f_{11}(x_{30}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{31}, x_{32}) \Rightarrow p_2(f_3(x_{31}), f_3(x_{32}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{33}, x_{34}) \Rightarrow p_2(f_4(x_{33}), f_4(x_{34}))$ cnf(p2$_{13}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{14}$, negated_conjecture)
$p_{13}(x_6, c_{18}) \Rightarrow p_{12}(x_6, f_3(x_6), f_3(f_5(x_6)))$ cnf(p12$_{15}$, negated_conjecture)
$p_2(f_7(f_8(c_{21}, c_{22}), c_{20}), f_6(f_5(c_{18}), f_3(c_{18})))$ cnf(p2$_{16}$, negated_conjecture)
$p_{13}(x_{17}, f_5(c_{18})) \Rightarrow p_2(f_{10}(x_{17}), f_9(c_{20}, f_{11}(x_{17})))$ cnf(p2$_{17}$, negated_conjecture)
$(p_2(x_9, x_7)$ and $p_2(x_{10}, x_8)$ and $p_{13}(x_9, x_{10})) \Rightarrow p_{13}(x_7, x_8)$ cnf(p13$_{18}$, negated_conjecture)
$(p_2(x_{15}, x_{13})$ and $p_2(x_{16}, x_{14})$ and $p_{15}(x_{15}, x_{16})) \Rightarrow p_{15}(x_{13}, x_{14})$ cnf(p15$_{19}$, negated_conjecture)
$(p_2(x_{49}, x_{51})$ and $p_2(x_{50}, x_{52})) \Rightarrow p_2(f_9(x_{49}, x_{50}), f_9(x_{51}, x_{52}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_2(x_{37}, x_{39})$ and $p_2(x_{38}, x_{40})) \Rightarrow p_2(f_6(x_{37}, x_{38}), f_6(x_{39}, x_{40}))$ cnf(p2$_{21}$, negated_conjecture)
$(p_2(x_{41}, x_{43})$ and $p_2(x_{42}, x_{44})) \Rightarrow p_2(f_7(x_{41}, x_{42}), f_7(x_{43}, x_{44}))$ cnf(p2$_{22}$, negated_conjecture)
$(p_2(x_{45}, x_{47})$ and $p_2(x_{46}, x_{48})) \Rightarrow p_2(f_8(x_{45}, x_{46}), f_8(x_{47}, x_{48}))$ cnf(p2$_{23}$, negated_conjecture)
$p_{13}(x_{17}, f_5(c_{18})) \Rightarrow p_2(f_7(f_8(c_{21}, f_{10}(x_{17})), c_{20}), f_6(f_5(x_{17}), f_3(x_{17})))$ cnf(p2$_{24}$, negated_conjecture)
$(p_2(x_5, x_2)$ and $p_2(x_4, x_1)$ and $p_2(x_3, x_0)$ and $p_{12}(x_3, x_4, x_5)) \Rightarrow p_{12}(x_0, x_1, x_2)$ cnf(p12$_{25}$, negated_conjecture)
$(p_{15}(x_{53}, c_{21})$ and $p_2(x_{53}, f_9(c_{20}, x_{54}))) \Rightarrow \neg p_2(f_7(f_8(c_{21}, x_{53}), c_{20}), f_6(f_5(c_{18}), c_{19}))$ cnf(not_p15$_{26}$, negated_conjecture)
$(p_{15}(x_{21}, c_{21})$ and $p_2(x_{21}, f_9(c_{20}, x_{22}))$ and $p_2(f_7(f_8(c_{21}, x_{21}), c_{20}), f_6(f_5(c_{18}), x_{23}))) \Rightarrow p_2(x_{21}, c_{22})$ cnf(p2$_{27}$, negated_con
$(p_{15}(x_{21}, c_{21})$ and $p_2(x_{21}, f_9(c_{20}, x_{22}))$ and $p_2(f_7(f_8(c_{21}, x_{21}), c_{20}), f_6(f_5(c_{18}), x_{23}))) \Rightarrow p_2(x_{23}, f_3(c_{18}))$ cnf(p2$_{28}$, negated_
$(p_{15}(x_{24}, c_{21})$ and $p_{13}(x_{17}, f_5(c_{18}))$ and $p_2(x_{24}, f_9(c_{20}, x_{25}))$ and $p_2(f_7(f_8(c_{21}, x_{24}), c_{20}), f_6(f_5(x_{17}), x_{26}))) \Rightarrow p_2(x_{26}, f_3(x_{17}))$
$(p_{15}(x_{24}, c_{21})$ and $p_{13}(x_{17}, f_5(c_{18}))$ and $p_2(x_{24}, f_9(c_{20}, x_{25}))$ and $p_2(f_7(f_8(c_{21}, x_{24}), c_{20}), f_6(f_5(x_{17}), x_{26}))) \Rightarrow p_2(x_{24}, f_{10}(x_{17}$

SYN603-1.p Harrison problem 3812
$p_{14}(c_{20})$ cnf(c20_is_p14$_1$, negated_conjecture)
$p_2(x_{18}, x_{18})$ cnf(p2$_2$, negated_conjecture)
$p_{15}(c_{22}, c_{21})$ cnf(p15$_3$, negated_conjecture)
$p_2(f_3(c_{18}), c_{19})$ cnf(p2$_4$, negated_conjecture)
$p_2(c_{22}, f_9(c_{20}, c_{23}))$ cnf(p2$_5$, negated_conjecture)
$p_2(f_3(f_4(c_{16})), c_{17})$ cnf(p2$_6$, negated_conjecture)
$(p_{14}(x_{12})$ and $p_2(x_{12}, x_{11})) \Rightarrow p_{14}(x_{11})$ cnf(p14$_7$, negated_conjecture)
$p_{13}(x_{17}, f_5(c_{18})) \Rightarrow p_{15}(f_{10}(x_{17}), c_{21})$ cnf(p15$_8$, negated_conjecture)
$p_2(x_{35}, x_{36}) \Rightarrow p_2(f_5(x_{35}), f_5(x_{36}))$ cnf(p2$_9$, negated_conjecture)
$p_2(x_{27}, x_{28}) \Rightarrow p_2(f_{10}(x_{27}), f_{10}(x_{28}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{29}, x_{30}) \Rightarrow p_2(f_{11}(x_{29}), f_{11}(x_{30}))$ cnf(p2$_{11}$, negated_conjecture)

$p_2(x_{31}, x_{32}) \Rightarrow p_2(f_3(x_{31}), f_3(x_{32}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{33}, x_{34}) \Rightarrow p_2(f_4(x_{33}), f_4(x_{34}))$ cnf(p2$_{13}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{14}$, negated_conjecture)
$p_{13}(x_6, c_{18}) \Rightarrow p_{12}(x_6, f_3(x_6), f_3(f_5(x_6)))$ cnf(p12$_{15}$, negated_conjecture)
$p_{13}(x_{17}, f_5(c_{18})) \Rightarrow p_2(f_{10}(x_{17}), f_9(c_{20}, f_{11}(x_{17})))$ cnf(p2$_{16}$, negated_conjecture)
$(p_2(x_9, x_7)$ and $p_2(x_{10}, x_8)$ and $p_{13}(x_9, x_{10})) \Rightarrow p_{13}(x_7, x_8)$ cnf(p13$_{17}$, negated_conjecture)
$(p_2(x_{15}, x_{13})$ and $p_2(x_{16}, x_{14})$ and $p_{15}(x_{15}, x_{16})) \Rightarrow p_{15}(x_{13}, x_{14})$ cnf(p15$_{18}$, negated_conjecture)
$p_2(f_7(f_8(c_{21}, c_{22}), c_{20}), f_6(f_5(f_4(c_{16})), f_3(f_4(c_{16}))))$ cnf(p2$_{19}$, negated_conjecture)
$(p_2(x_{49}, x_{51})$ and $p_2(x_{50}, x_{52})) \Rightarrow p_2(f_9(x_{49}, x_{50}), f_9(x_{51}, x_{52}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_2(x_{37}, x_{39})$ and $p_2(x_{38}, x_{40})) \Rightarrow p_2(f_6(x_{37}, x_{38}), f_6(x_{39}, x_{40}))$ cnf(p2$_{21}$, negated_conjecture)
$(p_2(x_{41}, x_{43})$ and $p_2(x_{42}, x_{44})) \Rightarrow p_2(f_7(x_{41}, x_{42}), f_7(x_{43}, x_{44}))$ cnf(p2$_{22}$, negated_conjecture)
$(p_2(x_{45}, x_{47})$ and $p_2(x_{46}, x_{48})) \Rightarrow p_2(f_8(x_{45}, x_{46}), f_8(x_{47}, x_{48}))$ cnf(p2$_{23}$, negated_conjecture)
$p_{13}(x_{17}, f_5(c_{18})) \Rightarrow p_2(f_7(f_8(c_{21}, f_{10}(x_{17})), c_{20}), f_6(f_5(x_{17}), f_3(x_{17})))$ cnf(p2$_{24}$, negated_conjecture)
$(p_2(x_5, x_2)$ and $p_2(x_4, x_1)$ and $p_2(x_3, x_0)$ and $p_{12}(x_3, x_4, x_5)) \Rightarrow p_{12}(x_0, x_1, x_2)$ cnf(p12$_{25}$, negated_conjecture)
$(p_{15}(x_{53}, c_{21})$ and $p_2(x_{53}, f_9(c_{20}, x_{54}))) \Rightarrow \neg p_2(f_7(f_8(c_{21}, x_{53}), c_{20}), f_6(f_5(f_4(c_{16})), c_{17}))$ cnf(not_p15$_{26}$, negated_conjectur
$(p_{15}(x_{21}, c_{21})$ and $p_2(x_{21}, f_9(c_{20}, x_{22}))$ and $p_2(f_7(f_8(c_{21}, x_{21}), c_{20}), f_6(f_5(f_4(c_{16})), x_{23}))) \Rightarrow p_2(x_{21}, c_{22})$ cnf(p2$_{27}$, negated
$(p_{15}(x_{21}, c_{21})$ and $p_2(x_{21}, f_9(c_{20}, x_{22}))$ and $p_2(f_7(f_8(c_{21}, x_{21}), c_{20}), f_6(f_5(f_4(c_{16})), x_{23}))) \Rightarrow p_2(x_{23}, f_3(f_4(c_{16})))$ cnf(p2$_{28}$,
$(p_{15}(x_{24}, c_{21})$ and $p_{13}(x_{17}, f_5(c_{18}))$ and $p_2(x_{24}, f_9(c_{20}, x_{25}))$ and $p_2(f_7(f_8(c_{21}, x_{24}), c_{20}), f_6(f_5(x_{17}), x_{26}))) \Rightarrow p_2(x_{26}, f_3(x_{17}))$
$(p_{15}(x_{24}, c_{21})$ and $p_{13}(x_{17}, f_5(c_{18}))$ and $p_2(x_{24}, f_9(c_{20}, x_{25}))$ and $p_2(f_7(f_8(c_{21}, x_{24}), c_{20}), f_6(f_5(x_{17}), x_{26}))) \Rightarrow p_2(x_{24}, f_{10}(x_{17}))$

SYN604-1.p Harrison problem 3820
$p_{14}(x_0, x_0)$ cnf(p14$_1$, negated_conjecture)
$p_9(x_{49}, x_{49})$ cnf(p9$_2$, negated_conjecture)
$p_5(x_{42}, x_{42})$ cnf(p5$_3$, negated_conjecture)
$p_3(x_{31}, x_{31})$ cnf(p3$_4$, negated_conjecture)
$p_2(x_{20}, x_{20})$ cnf(p2$_5$, negated_conjecture)
$p_{15}(c_{17}, c_{18})$ cnf(p15$_6$, negated_conjecture)
$p_3(f_4(f_8(x_{41})), f_{12}(x_{41}))$ cnf(p3$_7$, negated_conjecture)
$p_3(f_{12}(f_{10}(x_{38})), f_{10}(x_{38}))$ cnf(p3$_8$, negated_conjecture)
$p_{16}(f_{10}(f_{11}(c_{21})), f_{12}(x_{16}))$ cnf(p16$_9$, negated_conjecture)
$p_{16}(x_{14}, x_{15})$ or $p_{16}(x_{15}, f_{12}(x_{14}))$ cnf(p16$_{10}$, negated_conjecture)
$p_9(x_{52}, x_{53}) \Rightarrow p_9(f_{11}(x_{52}), f_{11}(x_{53}))$ cnf(p9$_{11}$, negated_conjecture)
$p_2(x_{23}, x_{24}) \Rightarrow p_2(f_{13}(x_{23}), f_{13}(x_{24}))$ cnf(p2$_{12}$, negated_conjecture)
$p_3(x_{29}, x_{30}) \Rightarrow p_2(f_8(x_{29}), f_8(x_{30}))$ cnf(p2$_{13}$, negated_conjecture)
$p_9(x_{34}, x_{35}) \Rightarrow p_3(f_{10}(x_{34}), f_{10}(x_{35}))$ cnf(p3$_{14}$, negated_conjecture)
$p_3(x_{36}, x_{37}) \Rightarrow p_3(f_{12}(x_{36}), f_{12}(x_{37}))$ cnf(p3$_{15}$, negated_conjecture)
$p_2(x_{39}, x_{40}) \Rightarrow p_3(f_4(x_{39}), f_4(x_{40}))$ cnf(p3$_{16}$, negated_conjecture)
$p_{16}(f_4(f_6(c_{18}, c_{22})), f_4(f_6(c_{18}, x_{17})))$ cnf(p16$_{17}$, negated_conjecture)
$(p_{14}(x_0, x_1)$ and $p_{14}(x_0, x_2)) \Rightarrow p_{14}(x_1, x_2)$ cnf(p14$_{18}$, negated_conjecture)
$(p_9(x_{49}, x_{50})$ and $p_9(x_{49}, x_{51})) \Rightarrow p_9(x_{50}, x_{51})$ cnf(p9$_{19}$, negated_conjecture)
$(p_5(x_{42}, x_{43})$ and $p_5(x_{42}, x_{44})) \Rightarrow p_5(x_{43}, x_{44})$ cnf(p5$_{20}$, negated_conjecture)
$(p_3(x_{31}, x_{32})$ and $p_3(x_{31}, x_{33})) \Rightarrow p_3(x_{32}, x_{33})$ cnf(p3$_{21}$, negated_conjecture)
$(p_2(x_{20}, x_{21})$ and $p_2(x_{20}, x_{22})) \Rightarrow p_2(x_{21}, x_{22})$ cnf(p2$_{22}$, negated_conjecture)
$(p_{16}(x_{11}, x_{13})$ and $p_{16}(x_{13}, x_{12})) \Rightarrow p_{16}(x_{11}, x_{12})$ cnf(p16$_{23}$, negated_conjecture)
$(p_{15}(x_5, x_6)$ and $p_5(x_6, x_4)$ and $p_{14}(x_5, x_3)) \Rightarrow p_{15}(x_3, x_4)$ cnf(p15$_{24}$, negated_conjecture)
$(p_3(x_9, x_7)$ and $p_3(x_{10}, x_8)$ and $p_{16}(x_9, x_{10})) \Rightarrow p_{16}(x_7, x_8)$ cnf(p16$_{25}$, negated_conjecture)
$(p_2(x_{45}, x_{47})$ and $p_5(x_{46}, x_{48})) \Rightarrow p_5(f_7(x_{45}, x_{46}), f_7(x_{47}, x_{48}))$ cnf(p5$_{26}$, negated_conjecture)
$(p_2(x_{26}, x_{28})$ and $p_5(x_{25}, x_{27})) \Rightarrow p_2(f_6(x_{25}, x_{26}), f_6(x_{27}, x_{28}))$ cnf(p2$_{27}$, negated_conjecture)
$\neg p_{16}(f_4(f_6(f_7(c_{20}, c_{18}), x_{54})), f_4(f_6(f_7(c_{20}, c_{18}), f_{13}(x_{54}))))$ cnf(not_p16$_{28}$, negated_conjecture)
$p_{16}(f_4(x_{18}), f_{12}(c_{19})) \Rightarrow p_{16}(f_4(f_6(f_7(c_{20}, c_{18}), c_{23})), f_4(f_6(f_7(c_{20}, c_{18}), x_{18})))$ cnf(p16$_{29}$, negated_conjecture)
$p_{16}(c_{19}, f_4(x_{19})) \Rightarrow p_{16}(f_4(f_6(f_7(c_{20}, c_{18}), f_8(f_{10}(f_{11}(c_{21}))))), f_4(f_6(f_7(c_{20}, c_{18}), x_{19})))$ cnf(p16$_{30}$, negated_conjecture)

SYN605-1.p Harrison problem 3825
$\neg p_{16}(c_{21})$ cnf(c21_is_not_p16$_1$, negated_conjecture)
$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{43}, x_{43})$ cnf(p5$_3$, negated_conjecture)
$p_3(x_{18}, x_{18})$ cnf(p3$_4$, negated_conjecture)
$\neg p_5(c_{21}, f_7(c_{20}))$ cnf(not_p5$_5$, negated_conjecture)
$p_3(f_{12}(c_{22}, c_{21}), c_{22})$ cnf(p3$_6$, negated_conjecture)
$\neg p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ cnf(not_p3$_7$, negated_conjecture)

$p_3(f_{12}(f_{15}(c_{22}), c_{21}), f_{15}(c_{22}))$ cnf(p3$_8$, negated_conjecture)
$(p_{16}(x_1)$ and $p_5(x_1, x_0)) \Rightarrow p_{16}(x_0)$ cnf(p16$_9$, negated_conjecture)
$p_5(x_{48}, x_{49}) \Rightarrow p_5(f_8(x_{48}), f_8(x_{49}))$ cnf(p5$_{10}$, negated_conjecture)
$p_5(x_{14}, x_{15}) \Rightarrow p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{16}, x_{17}) \Rightarrow p_2(f_9(x_{16}), f_9(x_{17}))$ cnf(p2$_{12}$, negated_conjecture)
$p_5(x_{33}, x_{34}) \Rightarrow p_3(f_{13}(x_{33}), f_{13}(x_{34}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{39}, x_{40}) \Rightarrow p_3(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p3$_{14}$, negated_conjecture)
$p_2(x_{41}, x_{42}) \Rightarrow p_3(f_4(x_{41}), f_4(x_{42}))$ cnf(p3$_{15}$, negated_conjecture)
$p_5(x_{46}, x_{47}) \Rightarrow p_5(f_7(x_{46}), f_7(x_{47}))$ cnf(p5$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(x_{12}, x_{13})$ cnf(p2$_{17}$, negated_conjecture)
$(p_5(x_{43}, x_{44})$ and $p_5(x_{43}, x_{45})) \Rightarrow p_5(x_{44}, x_{45})$ cnf(p5$_{18}$, negated_conjecture)
$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \Rightarrow p_3(x_{19}, x_{20})$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_4, x_2)$ and $p_2(x_5, x_3)$ and $p_{17}(x_4, x_5)) \Rightarrow p_{17}(x_2, x_3)$ cnf(p17$_{20}$, negated_conjecture)
$(p_5(x_9, x_7)$ and $p_5(x_{10}, x_8)$ and $p_{18}(x_9, x_{10})) \Rightarrow p_{18}(x_7, x_8)$ cnf(p18$_{21}$, negated_conjecture)
$p_3(f_{12}(f_4(f_6(f_7(f_8(c_{20})))), c_{21}), f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{22}$, negated_conjecture)
$p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), c_{22})), f_6(f_7(f_8(c_{20}))))$ cnf(p17$_{23}$, negated_conjecture)
$(p_3(x_{35}, x_{37})$ and $p_3(x_{36}, x_{38})) \Rightarrow p_3(f_{14}(x_{35}, x_{36}), f_{14}(x_{37}, x_{38}))$ cnf(p3$_{24}$, negated_conjecture)
$(p_3(x_{21}, x_{23})$ and $p_3(x_{22}, x_{24})) \Rightarrow p_3(f_{10}(x_{21}, x_{22}), f_{10}(x_{23}, x_{24}))$ cnf(p3$_{25}$, negated_conjecture)
$(p_3(x_{25}, x_{27})$ and $p_3(x_{26}, x_{28})) \Rightarrow p_3(f_{11}(x_{25}, x_{26}), f_{11}(x_{27}, x_{28}))$ cnf(p3$_{26}$, negated_conjecture)
$(p_3(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{12}(x_{29}, x_{30}), f_{12}(x_{31}, x_{32}))$ cnf(p3$_{27}$, negated_conjecture)
$p_3(f_{12}(f_{15}(f_4(f_6(f_7(f_8(c_{20}))))), c_{21}), f_{15}(f_4(f_6(f_7(f_8(c_{20}))))))$ cnf(p3$_{28}$, negated_conjecture)
$\neg p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{12}(x_{50}, c_{21}))), f_6(f_7(f_8(c_{20}))))$ cnf(not_p17$_{29}$, negated_conjecture)
$p_{18}(x_6, c_{21}) \Rightarrow (p_5(x_6, f_7(c_{20}))$ or $p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ or $p_{17}(f_9(f_{10}(f_4(f_6(f_7(f_8(c_{20}))))), f_{11}(c_{19}, f_{12}(f_{13}(x_6), x_6)))), f_6(f_7($

SYN606-1.p Harrison problem 3826
$\neg p_{16}(c_{21})$ cnf(c21_is_not_p16$_1$, negated_conjecture)
$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{43}, x_{43})$ cnf(p5$_3$, negated_conjecture)
$p_3(x_{18}, x_{18})$ cnf(p3$_4$, negated_conjecture)
$\neg p_5(c_{21}, f_7(c_{20}))$ cnf(not_p5$_5$, negated_conjecture)
$p_3(f_{12}(c_{22}, c_{21}), f_{15}(c_{22}))$ cnf(p3$_6$, negated_conjecture)
$p_3(f_{12}(f_{15}(c_{22}), c_{21}), c_{22})$ cnf(p3$_7$, negated_conjecture)
$\neg p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ cnf(not_p3$_8$, negated_conjecture)
$(p_{16}(x_1)$ and $p_5(x_1, x_0)) \Rightarrow p_{16}(x_0)$ cnf(p16$_9$, negated_conjecture)
$p_5(x_{48}, x_{49}) \Rightarrow p_5(f_8(x_{48}), f_8(x_{49}))$ cnf(p5$_{10}$, negated_conjecture)
$p_5(x_{14}, x_{15}) \Rightarrow p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{16}, x_{17}) \Rightarrow p_2(f_9(x_{16}), f_9(x_{17}))$ cnf(p2$_{12}$, negated_conjecture)
$p_5(x_{33}, x_{34}) \Rightarrow p_3(f_{13}(x_{33}), f_{13}(x_{34}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{39}, x_{40}) \Rightarrow p_3(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p3$_{14}$, negated_conjecture)
$p_2(x_{41}, x_{42}) \Rightarrow p_3(f_4(x_{41}), f_4(x_{42}))$ cnf(p3$_{15}$, negated_conjecture)
$p_5(x_{46}, x_{47}) \Rightarrow p_5(f_7(x_{46}), f_7(x_{47}))$ cnf(p5$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(x_{12}, x_{13})$ cnf(p2$_{17}$, negated_conjecture)
$(p_5(x_{43}, x_{44})$ and $p_5(x_{43}, x_{45})) \Rightarrow p_5(x_{44}, x_{45})$ cnf(p5$_{18}$, negated_conjecture)
$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \Rightarrow p_3(x_{19}, x_{20})$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_4, x_2)$ and $p_2(x_5, x_3)$ and $p_{17}(x_4, x_5)) \Rightarrow p_{17}(x_2, x_3)$ cnf(p17$_{20}$, negated_conjecture)
$(p_5(x_9, x_7)$ and $p_5(x_{10}, x_8)$ and $p_{18}(x_9, x_{10})) \Rightarrow p_{18}(x_7, x_8)$ cnf(p18$_{21}$, negated_conjecture)
$p_3(f_{12}(f_4(f_6(f_7(f_8(c_{20})))), c_{21}), f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{22}$, negated_conjecture)
$p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), c_{22})), f_6(f_7(f_8(c_{20}))))$ cnf(p17$_{23}$, negated_conjecture)
$(p_3(x_{35}, x_{37})$ and $p_3(x_{36}, x_{38})) \Rightarrow p_3(f_{14}(x_{35}, x_{36}), f_{14}(x_{37}, x_{38}))$ cnf(p3$_{24}$, negated_conjecture)
$(p_3(x_{21}, x_{23})$ and $p_3(x_{22}, x_{24})) \Rightarrow p_3(f_{10}(x_{21}, x_{22}), f_{10}(x_{23}, x_{24}))$ cnf(p3$_{25}$, negated_conjecture)
$(p_3(x_{25}, x_{27})$ and $p_3(x_{26}, x_{28})) \Rightarrow p_3(f_{11}(x_{25}, x_{26}), f_{11}(x_{27}, x_{28}))$ cnf(p3$_{26}$, negated_conjecture)
$(p_3(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{12}(x_{29}, x_{30}), f_{12}(x_{31}, x_{32}))$ cnf(p3$_{27}$, negated_conjecture)
$p_3(f_{12}(f_{15}(f_4(f_6(f_7(f_8(c_{20}))))), c_{21}), f_{15}(f_4(f_6(f_7(f_8(c_{20}))))))$ cnf(p3$_{28}$, negated_conjecture)
$\neg p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{12}(x_{50}, c_{21}))), f_6(f_7(f_8(c_{20}))))$ cnf(not_p17$_{29}$, negated_conjecture)
$p_{18}(x_6, c_{21}) \Rightarrow (p_5(x_6, f_7(c_{20}))$ or $p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ or $p_{17}(f_9(f_{10}(f_4(f_6(f_7(f_8(c_{20}))))), f_{11}(c_{19}, f_{12}(f_{13}(x_6), x_6)))), f_6(f_7($

SYN607-1.p Harrison problem 3827
$\neg p_{16}(c_{21})$ cnf(c21_is_not_p16$_1$, negated_conjecture)
$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{43}, x_{43})$ cnf(p5$_3$, negated_conjecture)

$p_3(x_{18}, x_{18})$ cnf(p3$_4$, negated_conjecture)
$\neg\, p_5(c_{21}, f_7(c_{20}))$ cnf(not_p5$_5$, negated_conjecture)
$p_3(f_{12}(c_{22}, c_{21}), c_{22})$ cnf(p3$_6$, negated_conjecture)
$\neg\, p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ cnf(not_p3$_7$, negated_conjecture)
$p_3(f_{12}(f_{15}(c_{22}), c_{21}), f_{15}(c_{22}))$ cnf(p3$_8$, negated_conjecture)
$(p_{16}(x_1)$ and $p_5(x_1, x_0)) \Rightarrow p_{16}(x_0)$ cnf(p16$_9$, negated_conjecture)
$p_5(x_{48}, x_{49}) \Rightarrow p_5(f_8(x_{48}), f_8(x_{49}))$ cnf(p5$_{10}$, negated_conjecture)
$p_5(x_{14}, x_{15}) \Rightarrow p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{16}, x_{17}) \Rightarrow p_2(f_9(x_{16}), f_9(x_{17}))$ cnf(p2$_{12}$, negated_conjecture)
$p_5(x_{33}, x_{34}) \Rightarrow p_3(f_{13}(x_{33}), f_{13}(x_{34}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{39}, x_{40}) \Rightarrow p_3(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p3$_{14}$, negated_conjecture)
$p_2(x_{41}, x_{42}) \Rightarrow p_3(f_4(x_{41}), f_4(x_{42}))$ cnf(p3$_{15}$, negated_conjecture)
$p_5(x_{46}, x_{47}) \Rightarrow p_5(f_7(x_{46}), f_7(x_{47}))$ cnf(p5$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(x_{12}, x_{13})$ cnf(p2$_{17}$, negated_conjecture)
$(p_5(x_{43}, x_{44})$ and $p_5(x_{43}, x_{45})) \Rightarrow p_5(x_{44}, x_{45})$ cnf(p5$_{18}$, negated_conjecture)
$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \Rightarrow p_3(x_{19}, x_{20})$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_4, x_2)$ and $p_2(x_5, x_3)$ and $p_{17}(x_4, x_5)) \Rightarrow p_{17}(x_2, x_3)$ cnf(p17$_{20}$, negated_conjecture)
$(p_5(x_9, x_7)$ and $p_5(x_{10}, x_8)$ and $p_{18}(x_9, x_{10})) \Rightarrow p_{18}(x_7, x_8)$ cnf(p18$_{21}$, negated_conjecture)
$p_3(f_{12}(f_4(f_6(f_7(f_8(c_{20})))), c_{21}), f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{22}$, negated_conjecture)
$(p_3(x_{35}, x_{37})$ and $p_3(x_{36}, x_{38})) \Rightarrow p_3(f_{14}(x_{35}, x_{36}), f_{14}(x_{37}, x_{38}))$ cnf(p3$_{23}$, negated_conjecture)
$(p_3(x_{21}, x_{23})$ and $p_3(x_{22}, x_{24})) \Rightarrow p_3(f_{10}(x_{21}, x_{22}), f_{10}(x_{23}, x_{24}))$ cnf(p3$_{24}$, negated_conjecture)
$(p_3(x_{25}, x_{27})$ and $p_3(x_{26}, x_{28})) \Rightarrow p_3(f_{11}(x_{25}, x_{26}), f_{11}(x_{27}, x_{28}))$ cnf(p3$_{25}$, negated_conjecture)
$(p_3(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{12}(x_{29}, x_{30}), f_{12}(x_{31}, x_{32}))$ cnf(p3$_{26}$, negated_conjecture)
$p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{15}(c_{22}))), f_6(f_7(f_8(c_{20}))))$ cnf(p17$_{27}$, negated_conjecture)
$p_3(f_{12}(f_{15}(f_4(f_6(f_7(f_8(c_{20}))))), c_{21}), f_{15}(f_4(f_6(f_7(f_8(c_{20}))))))$ cnf(p3$_{28}$, negated_conjecture)
$\neg\, p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{12}(x_{50}, c_{21}))), f_6(f_7(f_8(c_{20}))))$ cnf(not_p17$_{29}$, negated_conjecture)
$p_{18}(x_6, c_{21}) \Rightarrow (p_5(x_6, f_7(c_{20}))$ or $p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ or $p_{17}(f_9(f_{10}(f_4(f_6(f_7(f_8(c_{20})))), f_{11}(c_{19}, f_{12}(f_{13}(x_6), x_6)))), f_6(f_7($

SYN608-1.p Harrison problem 3828
$\neg\, p_{16}(c_{21})$ cnf(c21_is_not_p16$_1$, negated_conjecture)
$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{43}, x_{43})$ cnf(p5$_3$, negated_conjecture)
$p_3(x_{18}, x_{18})$ cnf(p3$_4$, negated_conjecture)
$\neg\, p_5(c_{21}, f_7(c_{20}))$ cnf(not_p5$_5$, negated_conjecture)
$p_3(f_{12}(c_{22}, c_{21}), f_{15}(c_{22}))$ cnf(p3$_6$, negated_conjecture)
$p_3(f_{12}(f_{15}(c_{22}), c_{21}), c_{22})$ cnf(p3$_7$, negated_conjecture)
$\neg\, p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ cnf(not_p3$_8$, negated_conjecture)
$(p_{16}(x_1)$ and $p_5(x_1, x_0)) \Rightarrow p_{16}(x_0)$ cnf(p16$_9$, negated_conjecture)
$p_5(x_{48}, x_{49}) \Rightarrow p_5(f_8(x_{48}), f_8(x_{49}))$ cnf(p5$_{10}$, negated_conjecture)
$p_5(x_{14}, x_{15}) \Rightarrow p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{16}, x_{17}) \Rightarrow p_2(f_9(x_{16}), f_9(x_{17}))$ cnf(p2$_{12}$, negated_conjecture)
$p_5(x_{33}, x_{34}) \Rightarrow p_3(f_{13}(x_{33}), f_{13}(x_{34}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{39}, x_{40}) \Rightarrow p_3(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p3$_{14}$, negated_conjecture)
$p_2(x_{41}, x_{42}) \Rightarrow p_3(f_4(x_{41}), f_4(x_{42}))$ cnf(p3$_{15}$, negated_conjecture)
$p_5(x_{46}, x_{47}) \Rightarrow p_5(f_7(x_{46}), f_7(x_{47}))$ cnf(p5$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(x_{12}, x_{13})$ cnf(p2$_{17}$, negated_conjecture)
$(p_5(x_{43}, x_{44})$ and $p_5(x_{43}, x_{45})) \Rightarrow p_5(x_{44}, x_{45})$ cnf(p5$_{18}$, negated_conjecture)
$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \Rightarrow p_3(x_{19}, x_{20})$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_4, x_2)$ and $p_2(x_5, x_3)$ and $p_{17}(x_4, x_5)) \Rightarrow p_{17}(x_2, x_3)$ cnf(p17$_{20}$, negated_conjecture)
$(p_5(x_9, x_7)$ and $p_5(x_{10}, x_8)$ and $p_{18}(x_9, x_{10})) \Rightarrow p_{18}(x_7, x_8)$ cnf(p18$_{21}$, negated_conjecture)
$p_3(f_{12}(f_4(f_6(f_7(f_8(c_{20})))), c_{21}), f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{22}$, negated_conjecture)
$(p_3(x_{35}, x_{37})$ and $p_3(x_{36}, x_{38})) \Rightarrow p_3(f_{14}(x_{35}, x_{36}), f_{14}(x_{37}, x_{38}))$ cnf(p3$_{23}$, negated_conjecture)
$(p_3(x_{21}, x_{23})$ and $p_3(x_{22}, x_{24})) \Rightarrow p_3(f_{10}(x_{21}, x_{22}), f_{10}(x_{23}, x_{24}))$ cnf(p3$_{24}$, negated_conjecture)
$(p_3(x_{25}, x_{27})$ and $p_3(x_{26}, x_{28})) \Rightarrow p_3(f_{11}(x_{25}, x_{26}), f_{11}(x_{27}, x_{28}))$ cnf(p3$_{25}$, negated_conjecture)
$(p_3(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{12}(x_{29}, x_{30}), f_{12}(x_{31}, x_{32}))$ cnf(p3$_{26}$, negated_conjecture)
$p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{15}(c_{22}))), f_6(f_7(f_8(c_{20}))))$ cnf(p17$_{27}$, negated_conjecture)
$p_3(f_{12}(f_{15}(f_4(f_6(f_7(f_8(c_{20}))))), c_{21}), f_{15}(f_4(f_6(f_7(f_8(c_{20}))))))$ cnf(p3$_{28}$, negated_conjecture)
$\neg\, p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{12}(x_{50}, c_{21}))), f_6(f_7(f_8(c_{20}))))$ cnf(not_p17$_{29}$, negated_conjecture)
$p_{18}(x_6, c_{21}) \Rightarrow (p_5(x_6, f_7(c_{20}))$ or $p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ or $p_{17}(f_9(f_{10}(f_4(f_6(f_7(f_8(c_{20})))), f_{11}(c_{19}, f_{12}(f_{13}(x_6), x_6)))), f_6(f_7($

SYN609-1.p Harrison problem 3829

$\neg\, p_{16}(c_{21})$ cnf(c21_is_not_p16$_1$, negated_conjecture)

$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)

$p_5(x_{43}, x_{43})$ cnf(p5$_3$, negated_conjecture)

$p_3(x_{18}, x_{18})$ cnf(p3$_4$, negated_conjecture)

$\neg\, p_5(c_{21}, f_7(c_{20}))$ cnf(not_p5$_5$, negated_conjecture)

$p_3(f_{12}(c_{22}, c_{21}), c_{22})$ cnf(p3$_6$, negated_conjecture)

$\neg\, p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ cnf(not_p3$_7$, negated_conjecture)

$p_3(f_{12}(f_{15}(c_{22}), c_{21}), f_{15}(c_{22}))$ cnf(p3$_8$, negated_conjecture)

$(p_{16}(x_1)$ and $p_5(x_1, x_0)) \Rightarrow p_{16}(x_0)$ cnf(p16$_9$, negated_conjecture)

$p_5(x_{48}, x_{49}) \Rightarrow p_5(f_8(x_{48}), f_8(x_{49}))$ cnf(p5$_{10}$, negated_conjecture)

$p_5(x_{14}, x_{15}) \Rightarrow p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)

$p_3(x_{16}, x_{17}) \Rightarrow p_2(f_9(x_{16}), f_9(x_{17}))$ cnf(p2$_{12}$, negated_conjecture)

$p_5(x_{33}, x_{34}) \Rightarrow p_3(f_{13}(x_{33}), f_{13}(x_{34}))$ cnf(p3$_{13}$, negated_conjecture)

$p_3(x_{39}, x_{40}) \Rightarrow p_3(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p3$_{14}$, negated_conjecture)

$p_2(x_{41}, x_{42}) \Rightarrow p_3(f_4(x_{41}), f_4(x_{42}))$ cnf(p3$_{15}$, negated_conjecture)

$p_5(x_{46}, x_{47}) \Rightarrow p_5(f_7(x_{46}), f_7(x_{47}))$ cnf(p5$_{16}$, negated_conjecture)

$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(x_{12}, x_{13})$ cnf(p2$_{17}$, negated_conjecture)

$(p_5(x_{43}, x_{44})$ and $p_5(x_{43}, x_{45})) \Rightarrow p_5(x_{44}, x_{45})$ cnf(p5$_{18}$, negated_conjecture)

$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \Rightarrow p_3(x_{19}, x_{20})$ cnf(p3$_{19}$, negated_conjecture)

$(p_2(x_4, x_2)$ and $p_2(x_5, x_3)$ and $p_{17}(x_4, x_5)) \Rightarrow p_{17}(x_2, x_3)$ cnf(p17$_{20}$, negated_conjecture)

$(p_5(x_9, x_7)$ and $p_5(x_{10}, x_8)$ and $p_{18}(x_9, x_{10})) \Rightarrow p_{18}(x_7, x_8)$ cnf(p18$_{21}$, negated_conjecture)

$p_3(f_{12}(f_4(f_6(f_7(f_8(c_{20})))), c_{21}), f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{22}$, negated_conjecture)

$(p_3(x_{35}, x_{37})$ and $p_3(x_{36}, x_{38})) \Rightarrow p_3(f_{14}(x_{35}, x_{36}), f_{14}(x_{37}, x_{38}))$ cnf(p3$_{23}$, negated_conjecture)

$(p_3(x_{21}, x_{23})$ and $p_3(x_{22}, x_{24})) \Rightarrow p_3(f_{10}(x_{21}, x_{22}), f_{10}(x_{23}, x_{24}))$ cnf(p3$_{24}$, negated_conjecture)

$(p_3(x_{25}, x_{27})$ and $p_3(x_{26}, x_{28})) \Rightarrow p_3(f_{11}(x_{25}, x_{26}), f_{11}(x_{27}, x_{28}))$ cnf(p3$_{25}$, negated_conjecture)

$(p_3(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{12}(x_{29}, x_{30}), f_{12}(x_{31}, x_{32}))$ cnf(p3$_{26}$, negated_conjecture)

$p_3(f_{12}(f_{15}(f_4(f_6(f_7(f_8(c_{20}))))), c_{21}), f_{15}(f_4(f_6(f_7(f_8(c_{20}))))))$ cnf(p3$_{27}$, negated_conjecture)

$\neg\, p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{12}(x_{50}, c_{21}))), f_6(f_7(f_8(c_{20}))))$ cnf(not_p17$_{28}$, negated_conjecture)

$p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{15}(f_4(f_6(f_7(f_8(c_{20}))))))), f_6(f_7(f_8(c_{20}))))$ cnf(p17$_{29}$, negated_conjecture)

$p_{18}(x_6, c_{21}) \Rightarrow (p_5(x_6, f_7(c_{20}))$ or $p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ or $p_{17}(f_9(f_{10}(f_4(f_6(f_7(f_8(c_{20})))), f_{11}(c_{19}, f_{12}(f_{13}(x_6), x_6)))), f_6(f_7($

SYN610-1.p Harrison problem 3830

$\neg\, p_{16}(c_{21})$ cnf(c21_is_not_p16$_1$, negated_conjecture)

$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)

$p_5(x_{43}, x_{43})$ cnf(p5$_3$, negated_conjecture)

$p_3(x_{18}, x_{18})$ cnf(p3$_4$, negated_conjecture)

$\neg\, p_5(c_{21}, f_7(c_{20}))$ cnf(not_p5$_5$, negated_conjecture)

$p_3(f_{12}(c_{22}, c_{21}), f_{15}(c_{22}))$ cnf(p3$_6$, negated_conjecture)

$p_3(f_{12}(f_{15}(c_{22}), c_{21}), c_{22})$ cnf(p3$_7$, negated_conjecture)

$\neg\, p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ cnf(not_p3$_8$, negated_conjecture)

$(p_{16}(x_1)$ and $p_5(x_1, x_0)) \Rightarrow p_{16}(x_0)$ cnf(p16$_9$, negated_conjecture)

$p_5(x_{48}, x_{49}) \Rightarrow p_5(f_8(x_{48}), f_8(x_{49}))$ cnf(p5$_{10}$, negated_conjecture)

$p_5(x_{14}, x_{15}) \Rightarrow p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)

$p_3(x_{16}, x_{17}) \Rightarrow p_2(f_9(x_{16}), f_9(x_{17}))$ cnf(p2$_{12}$, negated_conjecture)

$p_5(x_{33}, x_{34}) \Rightarrow p_3(f_{13}(x_{33}), f_{13}(x_{34}))$ cnf(p3$_{13}$, negated_conjecture)

$p_3(x_{39}, x_{40}) \Rightarrow p_3(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p3$_{14}$, negated_conjecture)

$p_2(x_{41}, x_{42}) \Rightarrow p_3(f_4(x_{41}), f_4(x_{42}))$ cnf(p3$_{15}$, negated_conjecture)

$p_5(x_{46}, x_{47}) \Rightarrow p_5(f_7(x_{46}), f_7(x_{47}))$ cnf(p5$_{16}$, negated_conjecture)

$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_2(x_{12}, x_{13})$ cnf(p2$_{17}$, negated_conjecture)

$(p_5(x_{43}, x_{44})$ and $p_5(x_{43}, x_{45})) \Rightarrow p_5(x_{44}, x_{45})$ cnf(p5$_{18}$, negated_conjecture)

$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \Rightarrow p_3(x_{19}, x_{20})$ cnf(p3$_{19}$, negated_conjecture)

$(p_2(x_4, x_2)$ and $p_2(x_5, x_3)$ and $p_{17}(x_4, x_5)) \Rightarrow p_{17}(x_2, x_3)$ cnf(p17$_{20}$, negated_conjecture)

$(p_5(x_9, x_7)$ and $p_5(x_{10}, x_8)$ and $p_{18}(x_9, x_{10})) \Rightarrow p_{18}(x_7, x_8)$ cnf(p18$_{21}$, negated_conjecture)

$p_3(f_{12}(f_4(f_6(f_7(f_8(c_{20})))), c_{21}), f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{22}$, negated_conjecture)

$(p_3(x_{35}, x_{37})$ and $p_3(x_{36}, x_{38})) \Rightarrow p_3(f_{14}(x_{35}, x_{36}), f_{14}(x_{37}, x_{38}))$ cnf(p3$_{23}$, negated_conjecture)

$(p_3(x_{21}, x_{23})$ and $p_3(x_{22}, x_{24})) \Rightarrow p_3(f_{10}(x_{21}, x_{22}), f_{10}(x_{23}, x_{24}))$ cnf(p3$_{24}$, negated_conjecture)

$(p_3(x_{25}, x_{27})$ and $p_3(x_{26}, x_{28})) \Rightarrow p_3(f_{11}(x_{25}, x_{26}), f_{11}(x_{27}, x_{28}))$ cnf(p3$_{25}$, negated_conjecture)

$(p_3(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{12}(x_{29}, x_{30}), f_{12}(x_{31}, x_{32}))$ cnf(p3$_{26}$, negated_conjecture)

$p_3(f_{12}(f_{15}(f_4(f_6(f_7(f_8(c_{20}))))), c_{21}), f_{15}(f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{27}$, negated_conjecture)

$\neg\, p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{12}(x_{50}, c_{21}))), f_6(f_7(f_8(c_{20})))))$ cnf(not_p17$_{28}$, negated_conjecture)
$p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{15}(f_4(f_6(f_7(f_8(c_{20}))))))), f_6(f_7(f_8(c_{20})))))$ cnf(p17$_{29}$, negated_conjecture)
$p_{18}(x_6, c_{21}) \;\Rightarrow\; (p_5(x_6, f_7(c_{20}))$ or $p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ or $p_{17}(f_9(f_{10}(f_4(f_6(f_7(f_8(c_{20}))))), f_{11}(c_{19}, f_{12}(f_{13}(x_6), x_6)))), f_6(f_7($

SYN611-1.p Harrison problem 3831
$\neg\, p_{16}(c_{21})$ cnf(c21_is_not_p16$_1$, negated_conjecture)
$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{43}, x_{43})$ cnf(p5$_3$, negated_conjecture)
$p_3(x_{18}, x_{18})$ cnf(p3$_4$, negated_conjecture)
$\neg\, p_5(c_{21}, f_7(c_{20}))$ cnf(not_p5$_5$, negated_conjecture)
$p_3(f_{12}(c_{22}, c_{21}), c_{22})$ cnf(p3$_6$, negated_conjecture)
$\neg\, p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ cnf(not_p3$_7$, negated_conjecture)
$p_3(f_{12}(f_{15}(c_{22}), c_{21}), f_{15}(c_{22}))$ cnf(p3$_8$, negated_conjecture)
$(p_{16}(x_1)$ and $p_5(x_1, x_0)) \;\Rightarrow\; p_{16}(x_0)$ cnf(p16$_9$, negated_conjecture)
$p_5(x_{48}, x_{49}) \;\Rightarrow\; p_5(f_8(x_{48}), f_8(x_{49}))$ cnf(p5$_{10}$, negated_conjecture)
$p_5(x_{14}, x_{15}) \;\Rightarrow\; p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{16}, x_{17}) \;\Rightarrow\; p_2(f_9(x_{16}), f_9(x_{17}))$ cnf(p2$_{12}$, negated_conjecture)
$p_5(x_{33}, x_{34}) \;\Rightarrow\; p_3(f_{13}(x_{33}), f_{13}(x_{34}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{39}, x_{40}) \;\Rightarrow\; p_3(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p3$_{14}$, negated_conjecture)
$p_2(x_{41}, x_{42}) \;\Rightarrow\; p_3(f_4(x_{41}), f_4(x_{42}))$ cnf(p3$_{15}$, negated_conjecture)
$p_5(x_{46}, x_{47}) \;\Rightarrow\; p_5(f_7(x_{46}), f_7(x_{47}))$ cnf(p5$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \;\Rightarrow\; p_2(x_{12}, x_{13})$ cnf(p2$_{17}$, negated_conjecture)
$(p_5(x_{43}, x_{44})$ and $p_5(x_{43}, x_{45})) \;\Rightarrow\; p_5(x_{44}, x_{45})$ cnf(p5$_{18}$, negated_conjecture)
$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \;\Rightarrow\; p_3(x_{19}, x_{20})$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_4, x_2)$ and $p_2(x_5, x_3)$ and $p_{17}(x_4, x_5)) \;\Rightarrow\; p_{17}(x_2, x_3)$ cnf(p17$_{20}$, negated_conjecture)
$(p_5(x_9, x_7)$ and $p_5(x_{10}, x_8)$ and $p_{18}(x_9, x_{10})) \;\Rightarrow\; p_{18}(x_7, x_8)$ cnf(p18$_{21}$, negated_conjecture)
$p_3(f_{12}(f_4(f_6(f_7(f_8(c_{20})))), c_{21}), f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{22}$, negated_conjecture)
$(p_3(x_{35}, x_{37})$ and $p_3(x_{36}, x_{38})) \;\Rightarrow\; p_3(f_{14}(x_{35}, x_{36}), f_{14}(x_{37}, x_{38}))$ cnf(p3$_{23}$, negated_conjecture)
$(p_3(x_{21}, x_{23})$ and $p_3(x_{22}, x_{24})) \;\Rightarrow\; p_3(f_{10}(x_{21}, x_{22}), f_{10}(x_{23}, x_{24}))$ cnf(p3$_{24}$, negated_conjecture)
$(p_3(x_{25}, x_{27})$ and $p_3(x_{26}, x_{28})) \;\Rightarrow\; p_3(f_{11}(x_{25}, x_{26}), f_{11}(x_{27}, x_{28}))$ cnf(p3$_{25}$, negated_conjecture)
$(p_3(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \;\Rightarrow\; p_3(f_{12}(x_{29}, x_{30}), f_{12}(x_{31}, x_{32}))$ cnf(p3$_{26}$, negated_conjecture)
$p_3(f_{12}(f_{15}(f_4(f_6(f_7(f_8(c_{20}))))), c_{21}), f_{15}(f_4(f_6(f_7(f_8(c_{20})))))))$ cnf(p3$_{27}$, negated_conjecture)
$\neg\, p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{12}(x_{50}, c_{21}))), f_6(f_7(f_8(c_{20})))))$ cnf(not_p17$_{28}$, negated_conjecture)
$p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_4(f_6(f_7(f_8(c_{20}))))))), f_6(f_7(f_8(c_{20})))))$ cnf(p17$_{29}$, negated_conjecture)
$p_{18}(x_6, c_{21}) \;\Rightarrow\; (p_5(x_6, f_7(c_{20}))$ or $p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ or $p_{17}(f_9(f_{10}(f_4(f_6(f_7(f_8(c_{20}))))), f_{11}(c_{19}, f_{12}(f_{13}(x_6), x_6)))), f_6(f_7($

SYN612-1.p Harrison problem 3832
$\neg\, p_{16}(c_{21})$ cnf(c21_is_not_p16$_1$, negated_conjecture)
$p_2(x_{11}, x_{11})$ cnf(p2$_2$, negated_conjecture)
$p_5(x_{43}, x_{43})$ cnf(p5$_3$, negated_conjecture)
$p_3(x_{18}, x_{18})$ cnf(p3$_4$, negated_conjecture)
$\neg\, p_5(c_{21}, f_7(c_{20}))$ cnf(not_p5$_5$, negated_conjecture)
$p_3(f_{12}(c_{22}, c_{21}), f_{15}(c_{22}))$ cnf(p3$_6$, negated_conjecture)
$p_3(f_{12}(f_{15}(c_{22}), c_{21}), c_{22})$ cnf(p3$_7$, negated_conjecture)
$\neg\, p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ cnf(not_p3$_8$, negated_conjecture)
$(p_{16}(x_1)$ and $p_5(x_1, x_0)) \;\Rightarrow\; p_{16}(x_0)$ cnf(p16$_9$, negated_conjecture)
$p_5(x_{48}, x_{49}) \;\Rightarrow\; p_5(f_8(x_{48}), f_8(x_{49}))$ cnf(p5$_{10}$, negated_conjecture)
$p_5(x_{14}, x_{15}) \;\Rightarrow\; p_2(f_6(x_{14}), f_6(x_{15}))$ cnf(p2$_{11}$, negated_conjecture)
$p_3(x_{16}, x_{17}) \;\Rightarrow\; p_2(f_9(x_{16}), f_9(x_{17}))$ cnf(p2$_{12}$, negated_conjecture)
$p_5(x_{33}, x_{34}) \;\Rightarrow\; p_3(f_{13}(x_{33}), f_{13}(x_{34}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{39}, x_{40}) \;\Rightarrow\; p_3(f_{15}(x_{39}), f_{15}(x_{40}))$ cnf(p3$_{14}$, negated_conjecture)
$p_2(x_{41}, x_{42}) \;\Rightarrow\; p_3(f_4(x_{41}), f_4(x_{42}))$ cnf(p3$_{15}$, negated_conjecture)
$p_5(x_{46}, x_{47}) \;\Rightarrow\; p_5(f_7(x_{46}), f_7(x_{47}))$ cnf(p5$_{16}$, negated_conjecture)
$(p_2(x_{11}, x_{12})$ and $p_2(x_{11}, x_{13})) \;\Rightarrow\; p_2(x_{12}, x_{13})$ cnf(p2$_{17}$, negated_conjecture)
$(p_5(x_{43}, x_{44})$ and $p_5(x_{43}, x_{45})) \;\Rightarrow\; p_5(x_{44}, x_{45})$ cnf(p5$_{18}$, negated_conjecture)
$(p_3(x_{18}, x_{19})$ and $p_3(x_{18}, x_{20})) \;\Rightarrow\; p_3(x_{19}, x_{20})$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_4, x_2)$ and $p_2(x_5, x_3)$ and $p_{17}(x_4, x_5)) \;\Rightarrow\; p_{17}(x_2, x_3)$ cnf(p17$_{20}$, negated_conjecture)
$(p_5(x_9, x_7)$ and $p_5(x_{10}, x_8)$ and $p_{18}(x_9, x_{10})) \;\Rightarrow\; p_{18}(x_7, x_8)$ cnf(p18$_{21}$, negated_conjecture)
$p_3(f_{12}(f_4(f_6(f_7(f_8(c_{20})))), c_{21}), f_4(f_6(f_7(f_8(c_{20})))))$ cnf(p3$_{22}$, negated_conjecture)
$(p_3(x_{35}, x_{37})$ and $p_3(x_{36}, x_{38})) \;\Rightarrow\; p_3(f_{14}(x_{35}, x_{36}), f_{14}(x_{37}, x_{38}))$ cnf(p3$_{23}$, negated_conjecture)

$(p_3(x_{21}, x_{23})$ and $p_3(x_{22}, x_{24})) \Rightarrow p_3(f_{10}(x_{21}, x_{22}), f_{10}(x_{23}, x_{24}))$ cnf(p3$_{24}$, negated_conjecture)
$(p_3(x_{25}, x_{27})$ and $p_3(x_{26}, x_{28})) \Rightarrow p_3(f_{11}(x_{25}, x_{26}), f_{11}(x_{27}, x_{28}))$ cnf(p3$_{25}$, negated_conjecture)
$(p_3(x_{29}, x_{31})$ and $p_5(x_{30}, x_{32})) \Rightarrow p_3(f_{12}(x_{29}, x_{30}), f_{12}(x_{31}, x_{32}))$ cnf(p3$_{26}$, negated_conjecture)
$p_3(f_{12}(f_{15}(f_4(f_6(f_7(f_8(c_{20}))))), c_{21}), f_{15}(f_4(f_6(f_7(f_8(c_{20}))))))$ cnf(p3$_{27}$, negated_conjecture)
$\neg p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_{12}(x_{50}, c_{21}))), f_6(f_7(f_8(c_{20}))))$ cnf(not_p17$_{28}$, negated_conjecture)
$p_{17}(f_9(f_{10}(f_{14}(f_4(f_9(c_{19})), c_{19}), f_4(f_6(f_7(f_8(c_{20})))))), f_6(f_7(f_8(c_{20}))))$ cnf(p17$_{29}$, negated_conjecture)
$p_{18}(x_6, c_{21}) \Rightarrow (p_5(x_6, f_7(c_{20}))$ or $p_3(c_{19}, f_4(f_6(f_7(c_{20}))))$ or $p_{17}(f_9(f_{10}(f_4(f_6(f_7(f_8(c_{20}))))), f_{11}(c_{19}, f_{12}(f_{13}(x_6), x_6)))), f_6(f_7($

SYN613-1.p Harrison problem 3862
$p_{11}(x_0, x_0)$ cnf(p11$_1$, negated_conjecture)
$p_6(x_{48}, x_{48})$ cnf(p6$_2$, negated_conjecture)
$p_5(x_{41}, x_{41})$ cnf(p5$_3$, negated_conjecture)
$p_3(x_{36}, x_{36})$ cnf(p3$_4$, negated_conjecture)
$p_2(x_{29}, x_{29})$ cnf(p2$_5$, negated_conjecture)
$p_{16}(x_{14}, x_{14})$ cnf(p16$_6$, negated_conjecture)
$p_{11}(c_{23}, f_{12}(f_9(c_{21})))$ cnf(p11$_7$, negated_conjecture)
$p_{11}(c_{24}, f_{12}(f_9(c_{21})))$ cnf(p11$_8$, negated_conjecture)
$p_5(x_{46}, x_{47}) \Rightarrow p_5(f_9(x_{46}), f_9(x_{47}))$ cnf(p5$_9$, negated_conjecture)
$p_5(x_3, x_4) \Rightarrow p_{11}(f_{12}(x_3), f_{12}(x_4))$ cnf(p11$_{10}$, negated_conjecture)
$p_{11}(x_5, x_6) \Rightarrow p_{11}(f_{13}(x_5), f_{13}(x_6))$ cnf(p11$_{11}$, negated_conjecture)
$p_{11}(x_{11}, x_{12}) \Rightarrow p_{11}(f_{15}(x_{11}), f_{15}(x_{12}))$ cnf(p11$_{12}$, negated_conjecture)
$p_2(x_{39}, x_{40}) \Rightarrow p_3(f_4(x_{39}), f_4(x_{40}))$ cnf(p3$_{13}$, negated_conjecture)
$p_2(x_{44}, x_{45}) \Rightarrow p_5(f_{10}(x_{44}), f_{10}(x_{45}))$ cnf(p5$_{14}$, negated_conjecture)
$(p_{11}(x_0, x_1)$ and $p_{11}(x_0, x_2)) \Rightarrow p_{11}(x_1, x_2)$ cnf(p11$_{15}$, negated_conjecture)
$(p_6(x_{48}, x_{49})$ and $p_6(x_{48}, x_{50})) \Rightarrow p_6(x_{49}, x_{50})$ cnf(p6$_{16}$, negated_conjecture)
$(p_5(x_{41}, x_{42})$ and $p_5(x_{41}, x_{43})) \Rightarrow p_5(x_{42}, x_{43})$ cnf(p5$_{17}$, negated_conjecture)
$(p_3(x_{36}, x_{37})$ and $p_3(x_{36}, x_{38})) \Rightarrow p_3(x_{37}, x_{38})$ cnf(p3$_{18}$, negated_conjecture)
$(p_2(x_{29}, x_{30})$ and $p_2(x_{29}, x_{31})) \Rightarrow p_2(x_{30}, x_{31})$ cnf(p2$_{19}$, negated_conjecture)
$(p_{16}(x_{14}, x_{15})$ and $p_{16}(x_{14}, x_{16})) \Rightarrow p_{16}(x_{15}, x_{16})$ cnf(p16$_{20}$, negated_conjecture)
$p_{17}(c_{19}, f_4(f_7(f_{10}(c_{20}), f_8(f_9(c_{21}), c_{22}))), c_{24})$ cnf(p17$_{21}$, negated_conjecture)
$\neg p_{17}(c_{19}, f_4(f_7(f_{10}(c_{20}), f_8(f_9(c_{21}), c_{22}))), c_{23})$ cnf(not_p17$_{22}$, negated_conjecture)
$(p_{11}(x_{26}, x_{24})$ and $p_{18}(x_{25}, x_{26})$ and $p_{11}(x_{25}, x_{23})) \Rightarrow p_{18}(x_{23}, x_{24})$ cnf(p18$_{23}$, negated_conjecture)
$(p_{11}(x_7, x_9)$ and $p_{11}(x_8, x_{10})) \Rightarrow p_{11}(f_{14}(x_7, x_8), f_{14}(x_9, x_{10}))$ cnf(p11$_{24}$, negated_conjecture)
$(p_5(x_{51}, x_{53})$ and $p_5(x_{52}, x_{54})) \Rightarrow p_6(f_8(x_{51}, x_{52}), f_8(x_{53}, x_{54}))$ cnf(p6$_{25}$, negated_conjecture)
$(p_5(x_{32}, x_{34})$ and $p_6(x_{33}, x_{35})) \Rightarrow p_2(f_7(x_{32}, x_{33}), f_7(x_{34}, x_{35}))$ cnf(p2$_{26}$, negated_conjecture)
$p_{11}(x_{28}, f_{12}(f_9(c_{21}))) \Rightarrow p_{18}(f_{13}(f_{14}(x_{28}, c_{25})), f_{13}(f_{14}(c_{23}, c_{25})))$ cnf(p18$_{27}$, negated_conjecture)
$p_{11}(x_{27}, f_{12}(f_9(c_{21}))) \Rightarrow p_{18}(f_{13}(f_{14}(x_{27}, c_{25})), f_{13}(f_{14}(c_{24}, c_{25})))$ cnf(p18$_{28}$, negated_conjecture)
$(p_3(x_{22}, x_{18})$ and $p_{16}(x_{21}, x_{17})$ and $p_{11}(x_{20}, x_{19})$ and $p_{17}(x_{21}, x_{22}, x_{20})) \Rightarrow p_{17}(x_{17}, x_{18}, x_{19})$ cnf(p17$_{29}$, negated_conjectur
$(p_{11}(x_{13}, f_{12}(f_9(c_{21})))$ and $p_{17}(c_{19}, f_4(c_{20}), x_{13})) \Rightarrow (p_{17}(c_{19}, f_4(c_{20}), c_{23})$ or $p_{11}(f_{15}(x_{13}), f_{12}(f_9(c_{21}))))$ cnf(p17$_{30}$, negate
$(p_{11}(x_{13}, f_{12}(f_9(c_{21})))$ and $p_{17}(c_{19}, f_4(c_{20}), x_{13})$ and $p_{18}(f_{13}(f_{14}(f_{15}(x_{13}), c_{25})), f_{13}(f_{14}(x_{13}, c_{25})))) \Rightarrow p_{17}(c_{19}, f_4(c_{20}), c_{23})$

SYN614-1.p Harrison problem 3878
$p_{13}(x_0, x_0)$ cnf(p13$_1$, negated_conjecture)
$p_7(x_{43}, x_{43})$ cnf(p7$_2$, negated_conjecture)
$p_2(x_{18}, x_{18})$ cnf(p2$_3$, negated_conjecture)
$p_{15}(x_7, x_7)$ cnf(p15$_4$, negated_conjecture)
$\neg p_2(c_{21}, f_3(c_{22}))$ cnf(not_p2$_5$, negated_conjecture)
$p_{19}(c_{23}, f_3(f_4(f_5(c_{22}))))$ cnf(p19$_6$, negated_conjecture)
$p_{20}(c_{24}, f_6(f_3(f_4(f_5(c_{22}))), c_{21}))$ cnf(p20$_7$, negated_conjecture)
$p_7(x_{52}, x_{53}) \Rightarrow p_7(f_{12}(x_{52}), f_{12}(x_{53}))$ cnf(p7$_8$, negated_conjecture)
$p_2(x_{29}, x_{30}) \Rightarrow p_2(f_3(x_{29}), f_3(x_{30}))$ cnf(p2$_9$, negated_conjecture)
$p_2(x_{31}, x_{32}) \Rightarrow p_2(f_4(x_{31}), f_4(x_{32}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{33}, x_{34}) \Rightarrow p_2(f_5(x_{33}), f_5(x_{34}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{50}, x_{51}) \Rightarrow p_7(f_{11}(x_{50}), f_{11}(x_{51}))$ cnf(p7$_{12}$, negated_conjecture)
$p_2(c_{26}, f_{14}(f_{16}(c_{28}, f_{17}(c_{21}, c_{27})), c_{25}))$ cnf(p2$_{13}$, negated_conjecture)
$(p_{13}(x_0, x_1)$ and $p_{13}(x_0, x_2)) \Rightarrow p_{13}(x_1, x_2)$ cnf(p13$_{14}$, negated_conjecture)
$(p_7(x_{43}, x_{44})$ and $p_7(x_{43}, x_{45})) \Rightarrow p_7(x_{44}, x_{45})$ cnf(p7$_{15}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{16}$, negated_conjecture)
$(p_{15}(x_7, x_8)$ and $p_{15}(x_7, x_9)) \Rightarrow p_{15}(x_8, x_9)$ cnf(p15$_{17}$, negated_conjecture)
$p_{19}(f_6(f_3(f_4(f_5(c_{22}))), f_{18}(c_{21}, f_3(f_5(c_{22})))), c_{24})$ cnf(p19$_{18}$, negated_conjecture)

$(p_2(x_{42}, x_{40})$ and $p_{20}(x_{41}, x_{42})$ and $p_2(x_{41}, x_{39})) \Rightarrow p_{20}(x_{39}, x_{40})$ cnf(p20$_{19}$, negated_conjecture)
$(p_2(x_{16}, x_{14})$ and $p_2(x_{17}, x_{15})$ and $p_{19}(x_{16}, x_{17})) \Rightarrow p_{19}(x_{14}, x_{15})$ cnf(p19$_{20}$, negated_conjecture)
$(p_{15}(x_4, x_6)$ and $p_2(x_3, x_5)) \Rightarrow p_{13}(f_{16}(x_3, x_4), f_{16}(x_5, x_6))$ cnf(p13$_{21}$, negated_conjecture)
$(p_7(x_{58}, x_{60})$ and $p_7(x_{59}, x_{61})) \Rightarrow p_7(f_9(x_{58}, x_{59}), f_9(x_{60}, x_{61}))$ cnf(p7$_{22}$, negated_conjecture)
$(p_7(x_{54}, x_{56})$ and $p_7(x_{55}, x_{57})) \Rightarrow p_7(f_8(x_{54}, x_{55}), f_8(x_{56}, x_{57}))$ cnf(p7$_{23}$, negated_conjecture)
$(p_2(x_{47}, x_{49})$ and $p_7(x_{46}, x_{48})) \Rightarrow p_7(f_{10}(x_{46}, x_{47}), f_{10}(x_{48}, x_{49}))$ cnf(p7$_{24}$, negated_conjecture)
$(p_2(x_{35}, x_{37})$ and $p_2(x_{36}, x_{38})) \Rightarrow p_2(f_6(x_{35}, x_{36}), f_6(x_{37}, x_{38}))$ cnf(p2$_{25}$, negated_conjecture)
$(p_2(x_{25}, x_{27})$ and $p_2(x_{26}, x_{28})) \Rightarrow p_2(f_{18}(x_{25}, x_{26}), f_{18}(x_{27}, x_{28}))$ cnf(p2$_{26}$, negated_conjecture)
$(p_{13}(x_{21}, x_{23})$ and $p_7(x_{22}, x_{24})) \Rightarrow p_2(f_{14}(x_{21}, x_{22}), f_{14}(x_{23}, x_{24}))$ cnf(p2$_{27}$, negated_conjecture)
$(p_2(x_{10}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_{15}(f_{17}(x_{10}, x_{11}), f_{17}(x_{12}, x_{13}))$ cnf(p15$_{28}$, negated_conjecture)
$p_7(c_{25}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{22})))), c_{23}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{22})))), c_{26}), f_9(f_{11}(c_{24}), f_{10}(f_{11}(f_3(f_4(f_5(c_{22})))), c_{27})))))$ cnf
$(p_{19}(x_{62}, f_3(f_4(f_5(c_{22}))))$ and $p_{20}(x_{63}, f_6(f_3(f_4(f_5(c_{22})))), c_{21}))$ and $p_2(f_{14}(f_{16}(c_{28}, f_{17}(c_{21}, c_{27})), c_{25}), f_3(c_{22}))) \Rightarrow \neg p_7(c_{25}, f_8$
$(p_{19}(x_{62}, f_3(f_4(f_5(c_{22}))))$ and $p_{20}(x_{63}, f_6(f_3(f_4(f_5(c_{22})))), c_{21}))$ and $p_{19}(f_6(f_3(f_4(f_5(c_{22})))), f_{18}(c_{21}, f_3(f_5(c_{22})))), x_{63})) \Rightarrow$
$\neg p_7(c_{25}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{22})))), x_{62}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{22})))), f_{14}(f_{16}(c_{28}, f_{17}(c_{21}, c_{27})), c_{25})), f_9(f_{11}(x_{63}), f_{10}(f_{11}(f_3($

SYN615-1.p Harrison problem 3879

$p_{13}(x_0, x_0)$ cnf(p13$_1$, negated_conjecture)
$p_7(x_{43}, x_{43})$ cnf(p7$_2$, negated_conjecture)
$p_2(x_{18}, x_{18})$ cnf(p2$_3$, negated_conjecture)
$p_{15}(x_7, x_7)$ cnf(p15$_4$, negated_conjecture)
$p_2(c_{26}, f_3(c_{22}))$ cnf(p2$_5$, negated_conjecture)
$\neg p_2(c_{21}, f_3(c_{22}))$ cnf(not_p2$_6$, negated_conjecture)
$p_{19}(c_{23}, f_3(f_4(f_5(c_{22}))))$ cnf(p19$_7$, negated_conjecture)
$p_{20}(c_{24}, f_6(f_3(f_4(f_5(c_{22})))), c_{21}))$ cnf(p20$_8$, negated_conjecture)
$p_7(x_{52}, x_{53}) \Rightarrow p_7(f_{12}(x_{52}), f_{12}(x_{53}))$ cnf(p7$_9$, negated_conjecture)
$p_2(x_{29}, x_{30}) \Rightarrow p_2(f_3(x_{29}), f_3(x_{30}))$ cnf(p2$_{10}$, negated_conjecture)
$p_2(x_{31}, x_{32}) \Rightarrow p_2(f_4(x_{31}), f_4(x_{32}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{33}, x_{34}) \Rightarrow p_2(f_5(x_{33}), f_5(x_{34}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{50}, x_{51}) \Rightarrow p_7(f_{11}(x_{50}), f_{11}(x_{51}))$ cnf(p7$_{13}$, negated_conjecture)
$p_2(c_{26}, f_{14}(f_{16}(c_{28}, f_{17}(c_{21}, c_{27})), c_{25}))$ cnf(p2$_{14}$, negated_conjecture)
$(p_{13}(x_0, x_1)$ and $p_{13}(x_0, x_2)) \Rightarrow p_{13}(x_1, x_2)$ cnf(p13$_{15}$, negated_conjecture)
$(p_7(x_{43}, x_{44})$ and $p_7(x_{43}, x_{45})) \Rightarrow p_7(x_{44}, x_{45})$ cnf(p7$_{16}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{17}$, negated_conjecture)
$(p_{15}(x_7, x_8)$ and $p_{15}(x_7, x_9)) \Rightarrow p_{15}(x_8, x_9)$ cnf(p15$_{18}$, negated_conjecture)
$(p_2(x_{42}, x_{40})$ and $p_{20}(x_{41}, x_{42})$ and $p_2(x_{41}, x_{39})) \Rightarrow p_{20}(x_{39}, x_{40})$ cnf(p20$_{19}$, negated_conjecture)
$(p_2(x_{16}, x_{14})$ and $p_2(x_{17}, x_{15})$ and $p_{19}(x_{16}, x_{17})) \Rightarrow p_{19}(x_{14}, x_{15})$ cnf(p19$_{20}$, negated_conjecture)
$(p_{15}(x_4, x_6)$ and $p_2(x_3, x_5)) \Rightarrow p_{13}(f_{16}(x_3, x_4), f_{16}(x_5, x_6))$ cnf(p13$_{21}$, negated_conjecture)
$(p_7(x_{58}, x_{60})$ and $p_7(x_{59}, x_{61})) \Rightarrow p_7(f_9(x_{58}, x_{59}), f_9(x_{60}, x_{61}))$ cnf(p7$_{22}$, negated_conjecture)
$(p_7(x_{54}, x_{56})$ and $p_7(x_{55}, x_{57})) \Rightarrow p_7(f_8(x_{54}, x_{55}), f_8(x_{56}, x_{57}))$ cnf(p7$_{23}$, negated_conjecture)
$(p_2(x_{47}, x_{49})$ and $p_7(x_{46}, x_{48})) \Rightarrow p_7(f_{10}(x_{46}, x_{47}), f_{10}(x_{48}, x_{49}))$ cnf(p7$_{24}$, negated_conjecture)
$(p_2(x_{35}, x_{37})$ and $p_2(x_{36}, x_{38})) \Rightarrow p_2(f_6(x_{35}, x_{36}), f_6(x_{37}, x_{38}))$ cnf(p2$_{25}$, negated_conjecture)
$(p_2(x_{25}, x_{27})$ and $p_2(x_{26}, x_{28})) \Rightarrow p_2(f_{18}(x_{25}, x_{26}), f_{18}(x_{27}, x_{28}))$ cnf(p2$_{26}$, negated_conjecture)
$(p_{13}(x_{21}, x_{23})$ and $p_7(x_{22}, x_{24})) \Rightarrow p_2(f_{14}(x_{21}, x_{22}), f_{14}(x_{23}, x_{24}))$ cnf(p2$_{27}$, negated_conjecture)
$(p_2(x_{10}, x_{12})$ and $p_2(x_{11}, x_{13})) \Rightarrow p_{15}(f_{17}(x_{10}, x_{11}), f_{17}(x_{12}, x_{13}))$ cnf(p15$_{28}$, negated_conjecture)
$p_7(c_{25}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{22})))), c_{23}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{22})))), c_{26}), f_9(f_{11}(c_{24}), f_{10}(f_{11}(f_3(f_4(f_5(c_{22})))), c_{27})))))$ cnf
$(p_{19}(x_{62}, f_3(f_4(f_5(c_{22}))))$ and $p_{20}(x_{63}, f_6(f_3(f_4(f_5(c_{22})))), c_{21}))$ and $p_2(f_{14}(f_{16}(c_{28}, f_{17}(c_{21}, c_{27})), c_{25}), f_3(c_{22}))) \Rightarrow \neg p_7(c_{25}, f_8$
$(p_{19}(x_{62}, f_3(f_4(f_5(c_{22}))))$ and $p_{20}(x_{63}, f_6(f_3(f_4(f_5(c_{22})))), c_{21}))$ and $p_{19}(f_6(f_3(f_4(f_5(c_{22})))), f_{18}(c_{21}, f_3(f_5(c_{22})))), x_{63})) \Rightarrow$
$\neg p_7(c_{25}, f_8(f_{10}(f_{12}(f_{11}(f_3(f_5(c_{22})))), x_{62}), f_8(f_{10}(f_{11}(f_3(f_4(f_5(c_{22})))), f_{14}(f_{16}(c_{28}, f_{17}(c_{21}, c_{27})), c_{25})), f_9(f_{11}(x_{63}), f_{10}(f_{11}(f_3($

SYN616-1.p Harrison problem 3901

$p_{17}(c_{28})$ cnf(c28_is_p17$_1$, negated_conjecture)
$p_{10}(x_0, x_0)$ cnf(p10$_2$, negated_conjecture)
$p_9(x_{60}, x_{60})$ cnf(p9$_3$, negated_conjecture)
$p_2(x_{31}, x_{31})$ cnf(p2$_4$, negated_conjecture)
$p_{18}(x_{24}, x_{24})$ cnf(p18$_5$, negated_conjecture)
$p_{19}(c_{26}, c_{27})$ cnf(p19$_6$, negated_conjecture)
$p_2(c_{25}, c_{28})$ cnf(p2$_7$, negated_conjecture)
$\neg p_{15}(c_{25}, c_{27})$ cnf(not_p15$_8$, negated_conjecture)
$p_{13}(f_3(f_4(f_5(c_{20}))), c_{21})$ cnf(p13$_9$, negated_conjecture)
$(p_{17}(x_{23})$ and $p_2(x_{23}, x_{22})) \Rightarrow p_{17}(x_{22})$ cnf(p17$_{10}$, negated_conjecture)

$p_2(x_{50}, x_{51}) \Rightarrow p_2(f_6(x_{50}), f_6(x_{51}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{44}, x_{45}) \Rightarrow p_2(f_3(x_{44}), f_3(x_{45}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{46}, x_{47}) \Rightarrow p_2(f_4(x_{46}), f_4(x_{47}))$ cnf(p2$_{13}$, negated_conjecture)
$p_2(x_{48}, x_{49}) \Rightarrow p_2(f_5(x_{48}), f_5(x_{49}))$ cnf(p2$_{14}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{15}$, negated_conjecture)
$(p_9(x_{60}, x_{61})$ and $p_9(x_{60}, x_{62})) \Rightarrow p_9(x_{61}, x_{62})$ cnf(p9$_{16}$, negated_conjecture)
$(p_2(x_{31}, x_{32})$ and $p_2(x_{31}, x_{33})) \Rightarrow p_2(x_{32}, x_{33})$ cnf(p2$_{17}$, negated_conjecture)
$(p_{18}(x_{24}, x_{25})$ and $p_{18}(x_{24}, x_{26})) \Rightarrow p_{18}(x_{25}, x_{26})$ cnf(p18$_{18}$, negated_conjecture)
$p_2(f_{11}(c_{23}, c_{24}, f_3(f_5(c_{20}))), f_8(c_{21}, f_3(f_5(c_{20}))))$ cnf(p2$_{19}$, negated_conjecture)
$(p_{17}(x_{17})$ and $p_{16}(x_{17}, f_8(c_{21}, f_3(f_5(c_{20})))))) \Rightarrow p_{15}(x_{17}, c_{24})$ cnf(p15$_{20}$, negated_conjecture)
$(p_2(x_5, x_3)$ and $p_2(x_6, x_4)$ and $p_{13}(x_5, x_6)) \Rightarrow p_{13}(x_3, x_4)$ cnf(p13$_{21}$, negated_conjecture)
$(p_{18}(x_{30}, x_{27})$ and $p_{19}(x_{30}, x_{29})$ and $p_{10}(x_{29}, x_{28})) \Rightarrow p_{19}(x_{27}, x_{28})$ cnf(p19$_{22}$, negated_conjecture)
$(p_2(x_{20}, x_{18})$ and $p_2(x_{21}, x_{19})$ and $p_{16}(x_{20}, x_{21})) \Rightarrow p_{16}(x_{18}, x_{19})$ cnf(p16$_{23}$, negated_conjecture)
$(p_{15}(x_{16}, x_{15})$ and $p_2(x_{16}, x_{13})$ and $p_{10}(x_{15}, x_{14})) \Rightarrow p_{15}(x_{13}, x_{14})$ cnf(p15$_{24}$, negated_conjecture)
$p_{14}(f_7(c_{22}, f_8(c_{21}, f_3(f_5(c_{20})))), f_3(f_5(c_{20})), f_6(c_{21}))$ cnf(p14$_{25}$, negated_conjecture)
$(p_2(x_{56}, x_{58})$ and $p_2(x_{57}, x_{59})) \Rightarrow p_2(f_8(x_{56}, x_{57}), f_8(x_{58}, x_{59}))$ cnf(p2$_{26}$, negated_conjecture)
$(p_2(x_{40}, x_{42})$ and $p_2(x_{41}, x_{43})) \Rightarrow p_2(f_{12}(x_{40}, x_{41}), f_{12}(x_{42}, x_{43}))$ cnf(p2$_{27}$, negated_conjecture)
$(p_2(x_{53}, x_{55})$ and $p_2(x_{52}, x_{54})) \Rightarrow p_2(f_7(x_{52}, x_{53}), f_7(x_{54}, x_{55}))$ cnf(p2$_{28}$, negated_conjecture)
$p_{14}(f_7(c_{22}, f_{12}(f_8(c_{21}, f_3(f_5(c_{20}))), c_{25})), f_3(f_5(c_{20})), f_6(c_{21}))$ cnf(p14$_{29}$, negated_conjecture)
$\neg p_{14}(f_7(c_{22}, f_{12}(f_8(c_{21}, f_3(f_5(c_{20}))), c_{28})), f_3(f_5(c_{20})), f_6(c_{21}))$ cnf(not_p14$_{30}$, negated_conjecture)
$(p_2(x_{12}, x_9)$ and $p_2(x_{11}, x_8)$ and $p_2(x_{10}, x_7)$ and $p_{14}(x_{10}, x_{11}, x_{12})) \Rightarrow p_{14}(x_7, x_8, x_9)$ cnf(p14$_{31}$, negated_conjecture)
$(p_2(x_{36}, x_{39})$ and $p_9(x_{34}, x_{37})$ and $p_{10}(x_{35}, x_{38})) \Rightarrow p_2(f_{11}(x_{34}, x_{35}, x_{36}), f_{11}(x_{37}, x_{38}, x_{39}))$ cnf(p2$_{32}$, negated_conjecture)

SYN617-1.p Harrison problem 3908
$p_{11}(x_0, x_0)$ cnf(p11$_1$, negated_conjecture)
$p_9(x_{53}, x_{53})$ cnf(p9$_2$, negated_conjecture)
$p_7(x_{42}, x_{42})$ cnf(p7$_3$, negated_conjecture)
$p_2(x_{27}, x_{27})$ cnf(p2$_4$, negated_conjecture)
$p_{13}(x_{11}, x_{11})$ cnf(p13$_5$, negated_conjecture)
$p_{19}(c_{21}, c_{22})$ cnf(p19$_6$, negated_conjecture)
$p_{11}(f_{12}(f_{14}(x_5, x_6)), x_6)$ cnf(p11$_7$, negated_conjecture)
$p_7(f_8(f_{10}(x_{51}, x_{52})), x_{52})$ cnf(p7$_8$, negated_conjecture)
$p_9(f_{18}(f_5(c_{20}), x_{64}), f_{17}(x_{64}))$ cnf(p9$_9$, negated_conjecture)
$p_{13}(f_{15}(f_5(c_{20}), x_{20}), f_{16}(x_{20}))$ cnf(p13$_{10}$, negated_conjecture)
$p_{11}(x_3, x_4) \Rightarrow p_{11}(f_{12}(x_3), f_{12}(x_4))$ cnf(p11$_{11}$, negated_conjecture)
$p_7(x_{56}, x_{57}) \Rightarrow p_9(f_{17}(x_{56}), f_{17}(x_{57}))$ cnf(p9$_{12}$, negated_conjecture)
$p_7(x_{49}, x_{50}) \Rightarrow p_7(f_8(x_{49}), f_8(x_{50}))$ cnf(p7$_{13}$, negated_conjecture)
$p_2(x_{40}, x_{41}) \Rightarrow p_2(f_6(x_{40}), f_6(x_{41}))$ cnf(p2$_{14}$, negated_conjecture)
$p_2(x_{38}, x_{39}) \Rightarrow p_2(f_5(x_{38}), f_5(x_{39}))$ cnf(p2$_{15}$, negated_conjecture)
$p_2(x_{30}, x_{31}) \Rightarrow p_2(f_3(x_{30}), f_3(x_{31}))$ cnf(p2$_{16}$, negated_conjecture)
$p_{11}(x_{21}, x_{22}) \Rightarrow p_{13}(f_{16}(x_{21}), f_{16}(x_{22}))$ cnf(p13$_{17}$, negated_conjecture)
$p_9(f_{18}(f_3(x_{62}), x_{63}), f_{18}(x_{62}, f_8(x_{63})))$ cnf(p9$_{18}$, negated_conjecture)
$p_{13}(f_{15}(f_3(x_{18}), x_{19}), f_{15}(x_{18}, f_{12}(x_{19})))$ cnf(p13$_{19}$, negated_conjecture)
$(p_{11}(x_0, x_1)$ and $p_{11}(x_0, x_2)) \Rightarrow p_{11}(x_1, x_2)$ cnf(p11$_{20}$, negated_conjecture)
$(p_9(x_{53}, x_{54})$ and $p_9(x_{53}, x_{55})) \Rightarrow p_9(x_{54}, x_{55})$ cnf(p9$_{21}$, negated_conjecture)
$(p_7(x_{42}, x_{43})$ and $p_7(x_{42}, x_{44})) \Rightarrow p_7(x_{43}, x_{44})$ cnf(p7$_{22}$, negated_conjecture)
$(p_2(x_{27}, x_{28})$ and $p_2(x_{27}, x_{29})) \Rightarrow p_2(x_{28}, x_{29})$ cnf(p2$_{23}$, negated_conjecture)
$(p_{13}(x_{11}, x_{12})$ and $p_{13}(x_{11}, x_{13})) \Rightarrow p_{13}(x_{12}, x_{13})$ cnf(p13$_{24}$, negated_conjecture)
$(p_2(x_{25}, x_{23})$ and $p_2(x_{26}, x_{24})$ and $p_{19}(x_{25}, x_{26})) \Rightarrow p_{19}(x_{23}, x_{24})$ cnf(p19$_{25}$, negated_conjecture)
$(p_2(x_{58}, x_{60})$ and $p_7(x_{59}, x_{61})) \Rightarrow p_9(f_{18}(x_{58}, x_{59}), f_{18}(x_{60}, x_{61}))$ cnf(p9$_{26}$, negated_conjecture)
$(p_{11}(x_8, x_{10})$ and $p_{13}(x_7, x_9)) \Rightarrow p_{11}(f_{14}(x_7, x_8), f_{14}(x_9, x_{10}))$ cnf(p11$_{27}$, negated_conjecture)
$(p_{11}(x_{15}, x_{17})$ and $p_2(x_{14}, x_{16})) \Rightarrow p_{13}(f_{15}(x_{14}, x_{15}), f_{15}(x_{16}, x_{17}))$ cnf(p13$_{28}$, negated_conjecture)
$(p_2(x_{32}, x_{34})$ and $p_2(x_{33}, x_{35})) \Rightarrow p_2(f_4(x_{32}, x_{33}), f_4(x_{34}, x_{35}))$ cnf(p2$_{29}$, negated_conjecture)
$(p_7(x_{46}, x_{48})$ and $p_9(x_{45}, x_{47})) \Rightarrow p_7(f_{10}(x_{45}, x_{46}), f_{10}(x_{47}, x_{48}))$ cnf(p7$_{30}$, negated_conjecture)
$p_{19}(x_{37}, x_{36}) \Rightarrow p_2(f_4(f_4(f_3(x_{36}), f_5(f_6(c_{20}))), x_{37}), f_3(f_4(f_4(x_{36}, f_5(f_6(c_{20}))), x_{37})))$ cnf(p2$_{31}$, negated_conjecture)
$\neg p_{13}(f_{15}(f_4(f_4(f_3(c_{22}), f_5(f_6(c_{20}))), c_{21}), f_{14}(c_{23}, c_{24})), f_{15}(f_4(f_4(c_{22}, f_5(f_6(c_{20}))), c_{21}), c_{24}))$ cnf(not_p13$_{32}$, negated_conje

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$p_9(c_{16})$ cnf(c16_is_p9$_1$, negated_conjecture)
$p_{10}(x_0, x_0)$ cnf(p10$_2$, negated_conjecture)

$p_5(x_{34}, x_{34})$ cnf(p5$_3$, negated_conjecture)
$p_4(x_{29}, x_{29})$ cnf(p4$_4$, negated_conjecture)
$p_2(x_{24}, x_{24})$ cnf(p2$_5$, negated_conjecture)
$p_{14}(x_{17}, x_{17})$ cnf(p14$_6$, negated_conjecture)
$p_{12}(c_{19}, c_{20})$ cnf(p12$_7$, negated_conjecture)
$p_{13}(c_{23}, c_{21})$ cnf(p13$_8$, negated_conjecture)
$p_{13}(c_{19}, c_{23})$ cnf(p13$_9$, negated_conjecture)
$p_{13}(c_{19}, c_{21})$ cnf(p13$_{10}$, negated_conjecture)
$p_{12}(c_{20}, c_{21})$ cnf(p12$_{11}$, negated_conjecture)
$p_2(c_{17}, f_3(c_{16}))$ cnf(p2$_{12}$, negated_conjecture)
$p_{11}(c_{16}, c_{17}, c_{18})$ cnf(p11$_{13}$, negated_conjecture)
$p_5(f_8(c_{16}, c_{20}), f_6(f_7(c_{22})))$ cnf(p5$_{14}$, negated_conjecture)
$(p_9(x_{45})$ and $p_2(x_{45}, x_{44})) \Rightarrow p_9(x_{44})$ cnf(p9$_{15}$, negated_conjecture)
$p_5(f_8(f_3(c_{16}), c_{23}), f_6(f_7(c_{22})))$ cnf(p5$_{16}$, negated_conjecture)
$\neg\, p_5(f_8(f_3(c_{16}), c_{20}), f_6(f_7(c_{22})))$ cnf(not_p5$_{17}$, negated_conjecture)
$p_4(x_{38}, x_{39}) \Rightarrow p_5(f_6(x_{38}), f_6(x_{39}))$ cnf(p5$_{18}$, negated_conjecture)
$p_2(x_{27}, x_{28}) \Rightarrow p_2(f_3(x_{27}), f_3(x_{28}))$ cnf(p2$_{19}$, negated_conjecture)
$p_4(x_{32}, x_{33}) \Rightarrow p_4(f_7(x_{32}), f_7(x_{33}))$ cnf(p4$_{20}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{21}$, negated_conjecture)
$(p_5(x_{34}, x_{35})$ and $p_5(x_{34}, x_{36})) \Rightarrow p_5(x_{35}, x_{36})$ cnf(p5$_{22}$, negated_conjecture)
$(p_4(x_{29}, x_{30})$ and $p_4(x_{29}, x_{31})) \Rightarrow p_4(x_{30}, x_{31})$ cnf(p4$_{23}$, negated_conjecture)
$(p_2(x_{24}, x_{25})$ and $p_2(x_{24}, x_{26})) \Rightarrow p_2(x_{25}, x_{26})$ cnf(p2$_{24}$, negated_conjecture)
$(p_{14}(x_{17}, x_{18})$ and $p_{14}(x_{17}, x_{19})) \Rightarrow p_{14}(x_{18}, x_{19})$ cnf(p14$_{25}$, negated_conjecture)
$(p_5(x_{11}, x_9)$ and $p_5(x_{12}, x_{10})$ and $p_{12}(x_{11}, x_{12})) \Rightarrow p_{12}(x_9, x_{10})$ cnf(p12$_{26}$, negated_conjecture)
$(p_{14}(x_{23}, x_{20})$ and $p_{15}(x_{23}, x_{22})$ and $p_{10}(x_{22}, x_{21})) \Rightarrow p_{15}(x_{20}, x_{21})$ cnf(p15$_{27}$, negated_conjecture)
$(p_5(x_{15}, x_{13})$ and $p_5(x_{16}, x_{14})$ and $p_{13}(x_{15}, x_{16})) \Rightarrow p_{13}(x_{13}, x_{14})$ cnf(p13$_{28}$, negated_conjecture)
$(p_{13}(x_{37}, c_{21})$ and $p_{13}(c_{19}, x_{37})$ and $p_{15}(c_{24}, c_{18})) \Rightarrow p_5(x_{37}, c_{20})$ cnf(p5$_{29}$, negated_conjecture)
$(p_2(x_{40}, x_{42})$ and $p_5(x_{41}, x_{43})) \Rightarrow p_5(f_8(x_{40}, x_{41}), f_8(x_{42}, x_{43}))$ cnf(p5$_{30}$, negated_conjecture)
$(p_{13}(x_{37}, c_{21})$ and $p_{13}(c_{19}, x_{37})$ and $p_5(f_8(c_{17}, x_{37}), f_6(f_7(c_{22})))) \Rightarrow p_5(x_{37}, c_{20})$ cnf(p5$_{31}$, negated_conjecture)
$(p_{13}(x_{37}, c_{21})$ and $p_{13}(c_{19}, x_{37})$ and $p_5(f_8(c_{16}, x_{37}), f_6(f_7(c_{22})))) \Rightarrow p_5(x_{37}, c_{20})$ cnf(p5$_{32}$, negated_conjecture)
$(p_2(x_8, x_4)$ and $p_2(x_7, x_3)$ and $p_{10}(x_6, x_5)$ and $p_{11}(x_7, x_8, x_6)) \Rightarrow p_{11}(x_3, x_4, x_5)$ cnf(p11$_{33}$, negated_conjecture)

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$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_8(x_{51}, x_{51})$ cnf(p8$_2$, negated_conjecture)
$p_5(x_{46}, x_{46})$ cnf(p5$_3$, negated_conjecture)
$p_4(x_{39}, x_{39})$ cnf(p4$_4$, negated_conjecture)
$p_2(x_{18}, x_{18})$ cnf(p2$_5$, negated_conjecture)
$p_{17}(x_9, x_9)$ cnf(p17$_6$, negated_conjecture)
$p_{18}(c_{24}, f_6(c_{25}))$ cnf(p18$_7$, negated_conjecture)
$\neg\, p_{18}(c_{24}, f_6(f_7(c_{22}, c_{23})))$ cnf(not_p18$_8$, negated_conjecture)
$p_{17}(f_3(x_{10}), x_{11}) \Rightarrow p_{17}(x_{10}, x_{11})$ cnf(p17$_9$, negated_conjecture)
$p_4(x_{49}, x_{50}) \Rightarrow p_5(f_6(x_{49}), f_6(x_{50}))$ cnf(p5$_{10}$, negated_conjecture)
$p_4(x_3, x_4) \Rightarrow p_{10}(f_{12}(x_3), f_{12}(x_4))$ cnf(p10$_{11}$, negated_conjecture)
$p_{10}(x_{25}, x_{26}) \Rightarrow p_2(f_{11}(x_{25}), f_{11}(x_{26}))$ cnf(p2$_{12}$, negated_conjecture)
$p_8(x_{31}, x_{32}) \Rightarrow p_2(f_{14}(x_{31}), f_{14}(x_{32}))$ cnf(p2$_{13}$, negated_conjecture)
$p_8(x_{33}, x_{34}) \Rightarrow p_2(f_{15}(x_{33}), f_{15}(x_{34}))$ cnf(p2$_{14}$, negated_conjecture)
$p_8(x_{35}, x_{36}) \Rightarrow p_2(f_{16}(x_{35}), f_{16}(x_{36}))$ cnf(p2$_{15}$, negated_conjecture)
$p_2(x_{37}, x_{38}) \Rightarrow p_2(f_3(x_{37}), f_3(x_{38}))$ cnf(p2$_{16}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{17}$, negated_conjecture)
$(p_8(x_{51}, x_{52})$ and $p_8(x_{51}, x_{53})) \Rightarrow p_8(x_{52}, x_{53})$ cnf(p8$_{18}$, negated_conjecture)
$(p_5(x_{46}, x_{47})$ and $p_5(x_{46}, x_{48})) \Rightarrow p_5(x_{47}, x_{48})$ cnf(p5$_{19}$, negated_conjecture)
$(p_4(x_{39}, x_{40})$ and $p_4(x_{39}, x_{41})) \Rightarrow p_4(x_{40}, x_{41})$ cnf(p4$_{20}$, negated_conjecture)
$(p_2(x_{18}, x_{19})$ and $p_2(x_{18}, x_{20})) \Rightarrow p_2(x_{19}, x_{20})$ cnf(p2$_{21}$, negated_conjecture)
$p_2(f_{13}(x_{21}, x_{23}), f_{13}(x_{22}, x_{24})) \Rightarrow p_2(x_{23}, x_{24})$ cnf(p2$_{22}$, negated_conjecture)
$p_2(f_{13}(x_{21}, x_{23}), f_{13}(x_{22}, x_{24})) \Rightarrow p_2(x_{21}, x_{22})$ cnf(p2$_{23}$, negated_conjecture)
$p_{18}(x_{12}, f_6(c_{25})) \Rightarrow (p_{18}(x_{12}, f_6(c_{19}))$ or $p_2(f_{14}(x_{12}), c_{20}))$ cnf(p18$_{24}$, negated_conjecture)
$(p_2(x_7, x_5)$ and $p_2(x_8, x_6)$ and $p_{17}(x_7, x_8)) \Rightarrow p_{17}(x_5, x_6)$ cnf(p17$_{25}$, negated_conjecture)
$(p_5(x_{16}, x_{14})$ and $p_8(x_{15}, x_{13})$ and $p_{18}(x_{15}, x_{16})) \Rightarrow p_{18}(x_{13}, x_{14})$ cnf(p18$_{26}$, negated_conjecture)
$p_{18}(x_{12}, f_6(c_{25})) \Rightarrow (p_{18}(x_{12}, f_6(c_{19}))$ or $p_{17}(f_3(c_{21}), f_{15}(x_{12})))$ cnf(p18$_{27}$, negated_conjecture)

$(p_2(x_{55}, x_{57})$ and $p_2(x_{54}, x_{56})) \Rightarrow p_8(f_9(x_{54}, x_{55}), f_9(x_{56}, x_{57}))$ cnf(p8$_{28}$, negated_conjecture)
$(p_2(x_{27}, x_{29})$ and $p_2(x_{28}, x_{30})) \Rightarrow p_2(f_{13}(x_{27}, x_{28}), f_{13}(x_{29}, x_{30}))$ cnf(p2$_{29}$, negated_conjecture)
$(p_2(x_{21}, x_{22})$ and $p_2(x_{23}, x_{24})) \Rightarrow p_2(f_{13}(x_{21}, x_{23}), f_{13}(x_{22}, x_{24}))$ cnf(p2$_{30}$, negated_conjecture)
$(p_2(x_{42}, x_{44})$ and $p_4(x_{43}, x_{45})) \Rightarrow p_4(f_7(x_{42}, x_{43}), f_7(x_{44}, x_{45}))$ cnf(p4$_{31}$, negated_conjecture)
$(p_2(x_{59}, c_{20})$ and $p_{17}(c_{21}, x_{58})) \Rightarrow \neg p_8(c_{24}, f_9(f_{13}(x_{59}, x_{58}), x_{60}))$ cnf(not_p2$_{32}$, negated_conjecture)
$p_{18}(x_{12}, f_6(c_{25})) \Rightarrow (p_{18}(x_{12}, f_6(c_{19}))$ or $p_8(x_{12}, f_9(f_{13}(f_{14}(x_{12}), f_{15}(x_{12})), f_{16}(x_{12}))))$ cnf(p18$_{33}$, negated_conjecture)
$p_{18}(x_{17}, f_6(c_{19})) \Rightarrow (p_{18}(x_{17}, f_6(f_7(c_{22}, c_{23})))$ or $p_8(x_{17}, f_9(f_{13}(c_{20}, c_{21}), f_{11}(f_{12}(f_7(c_{22}, c_{23}))))))$ cnf(p18$_{34}$, negated_conje

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$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_5(x_{56}, x_{56})$ cnf(p5$_2$, negated_conjecture)
$p_3(x_{45}, x_{45})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_{33}, x_{33})$ cnf(p2$_4$, negated_conjecture)
$p_{11}(x_{20}, x_{20})$ cnf(p11$_5$, negated_conjecture)
$\neg p_{18}(f_6(c_{24}))$ cnf(f6_is_not_p18$_6$, negated_conjecture)
$\neg p_{18}(f_6(c_{22}))$ cnf(f6_is_not_p18$_7$, negated_conjecture)
$p_3(f_4(c_{22}), c_{23})$ cnf(p3$_8$, negated_conjecture)
$p_{19}(f_7(f_8(f_9(c_{25}))), c_{23})$ cnf(p19$_9$, negated_conjecture)
$(p_{18}(x_{28})$ and $p_5(x_{28}, x_{27})) \Rightarrow p_{18}(x_{27})$ cnf(p18$_{10}$, negated_conjecture)
$p_{11}(x_{10}, x_{11}) \Rightarrow p_{10}(f_{14}(x_{10}), f_{14}(x_{11}))$ cnf(p10$_{11}$, negated_conjecture)
$p_2(x_{59}, x_{60}) \Rightarrow p_5(f_6(x_{59}), f_6(x_{60}))$ cnf(p5$_{12}$, negated_conjecture)
$p_3(x_{54}, x_{55}) \Rightarrow p_3(f_9(x_{54}), f_9(x_{55}))$ cnf(p3$_{13}$, negated_conjecture)
$p_3(x_{52}, x_{53}) \Rightarrow p_3(f_8(x_{52}), f_8(x_{53}))$ cnf(p3$_{14}$, negated_conjecture)
$p_3(x_{50}, x_{51}) \Rightarrow p_3(f_7(x_{50}), f_7(x_{51}))$ cnf(p3$_{15}$, negated_conjecture)
$p_2(x_{48}, x_{49}) \Rightarrow p_3(f_4(x_{48}), f_4(x_{49}))$ cnf(p3$_{16}$, negated_conjecture)
$p_3(x_{25}, x_{26}) \Rightarrow p_{11}(f_{15}(x_{25}), f_{15}(x_{26}))$ cnf(p11$_{17}$, negated_conjecture)
$p_{10}(x_{23}, x_{24}) \Rightarrow p_{11}(f_{12}(x_{23}), f_{12}(x_{24}))$ cnf(p11$_{18}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{19}$, negated_conjecture)
$(p_5(x_{56}, x_{57})$ and $p_5(x_{56}, x_{58})) \Rightarrow p_5(x_{57}, x_{58})$ cnf(p5$_{20}$, negated_conjecture)
$(p_3(x_{45}, x_{46})$ and $p_3(x_{45}, x_{47})) \Rightarrow p_3(x_{46}, x_{47})$ cnf(p3$_{21}$, negated_conjecture)
$(p_2(x_{33}, x_{34})$ and $p_2(x_{33}, x_{35})) \Rightarrow p_2(x_{34}, x_{35})$ cnf(p2$_{22}$, negated_conjecture)
$(p_{11}(x_{20}, x_{21})$ and $p_{11}(x_{20}, x_{22})) \Rightarrow p_{11}(x_{21}, x_{22})$ cnf(p11$_{23}$, negated_conjecture)
$p_{10}(f_{13}(f_6(c_{22}), x_9), f_{13}(f_6(c_{24}), f_{16}(c_{26}, x_9)))$ cnf(p10$_{24}$, negated_conjecture)
$\neg p_{10}(f_{13}(f_6(c_{22}), f_{14}(f_{15}(f_7(c_{25})))), f_{14}(f_{15}(f_7(c_{25}))))$ cnf(not_p10$_{25}$, negated_conjecture)
$(p_3(x_{43}, x_{41})$ and $p_3(x_{44}, x_{42})$ and $p_{21}(x_{43}, x_{44})) \Rightarrow p_{21}(x_{41}, x_{42})$ cnf(p21$_{26}$, negated_conjecture)
$(p_3(x_{31}, x_{29})$ and $p_3(x_{32}, x_{30})$ and $p_{19}(x_{31}, x_{32})) \Rightarrow p_{19}(x_{29}, x_{30})$ cnf(p19$_{27}$, negated_conjecture)
$(p_{11}(x_{39}, x_{37})$ and $p_{20}(x_{38}, x_{39})$ and $p_{11}(x_{38}, x_{36})) \Rightarrow p_{20}(x_{36}, x_{37})$ cnf(p20$_{28}$, negated_conjecture)
$(p_{10}(x_4, x_6)$ and $p_5(x_3, x_5)) \Rightarrow p_{10}(f_{13}(x_3, x_4), f_{13}(x_5, x_6))$ cnf(p10$_{29}$, negated_conjecture)
$(p_2(x_{17}, x_{19})$ and $p_3(x_{16}, x_{18})) \Rightarrow p_{10}(f_{17}(x_{16}, x_{17}), f_{17}(x_{18}, x_{19}))$ cnf(p10$_{30}$, negated_conjecture)
$(p_{10}(x_{12}, x_{14})$ and $p_{10}(x_{13}, x_{15})) \Rightarrow p_{10}(f_{16}(x_{12}, x_{13}), f_{16}(x_{14}, x_{15}))$ cnf(p10$_{31}$, negated_conjecture)
$p_{20}(f_{12}(f_{13}(f_6(c_{22}), f_{14}(f_{15}(f_7(c_{25}))))), f_{12}(f_{13}(f_6(c_{24}), x_{40})))$ cnf(p20$_{32}$, negated_conjecture)
$\neg p_{20}(f_{12}(f_{13}(f_6(c_{22}), f_{14}(f_{15}(f_7(c_{25}))))), f_{12}(f_{13}(f_6(c_{22}), c_{27})))$ cnf(not_p20$_{33}$, negated_conjecture)
$(p_{21}(x_8, c_{23})$ and $p_3(f_4(x_7), x_8)) \Rightarrow (p_{18}(f_6(x_7))$ or $p_{10}(f_{13}(f_6(x_7), f_{17}(x_8, x_7)), f_{14}(f_{15}(f_7(c_{25})))))$ cnf(p18$_{34}$, negated_con

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$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_8(x_{78}, x_{78})$ cnf(p8$_2$, negated_conjecture)
$p_7(x_{71}, x_{71})$ cnf(p7$_3$, negated_conjecture)
$p_4(x_{38}, x_{38})$ cnf(p4$_4$, negated_conjecture)
$p_2(x_{12}, x_{12})$ cnf(p2$_5$, negated_conjecture)
$p_{13}(x_7, x_7)$ cnf(p13$_6$, negated_conjecture)
$\neg p_2(c_{23}, f_3(c_{24}))$ cnf(not_p2$_7$, negated_conjecture)
$p_7(x_{10}, x_{11}) \Rightarrow p_{13}(f_{14}(x_{10}), f_{14}(x_{11}))$ cnf(p13$_8$, negated_conjecture)
$p_4(x_{59}, x_{60}) \Rightarrow p_4(f_5(x_{59}), f_5(x_{60}))$ cnf(p4$_9$, negated_conjecture)
$p_2(x_{45}, x_{46}) \Rightarrow p_4(f_{16}(x_{45}), f_{16}(x_{46}))$ cnf(p4$_{10}$, negated_conjecture)
$p_2(x_{24}, x_{25}) \Rightarrow p_2(f_3(x_{24}), f_3(x_{25}))$ cnf(p2$_{11}$, negated_conjecture)
$p_2(x_{22}, x_{23}) \Rightarrow p_2(f_{18}(x_{22}), f_{18}(x_{23}))$ cnf(p2$_{12}$, negated_conjecture)
$p_2(x_{20}, x_{21}) \Rightarrow p_2(f_{17}(x_{20}), f_{17}(x_{21}))$ cnf(p2$_{13}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{14}$, negated_conjecture)
$(p_8(x_{78}, x_{79})$ and $p_8(x_{78}, x_{80})) \Rightarrow p_8(x_{79}, x_{80})$ cnf(p8$_{15}$, negated_conjecture)

$(p_7(x_{71},x_{72})$ and $p_7(x_{71},x_{73})) \Rightarrow p_7(x_{72},x_{73})$ cnf(p7$_{16}$, negated_conjecture)
$(p_4(x_{38},x_{39})$ and $p_4(x_{38},x_{40})) \Rightarrow p_4(x_{39},x_{40})$ cnf(p4$_{17}$, negated_conjecture)
$(p_{21}(x_{30},x_{32})$ and $p_{21}(x_{32},x_{31})) \Rightarrow p_{21}(x_{30},x_{31})$ cnf(p21$_{18}$, negated_conjecture)
$(p_2(x_{12},x_{13})$ and $p_2(x_{12},x_{14})) \Rightarrow p_2(x_{13},x_{14})$ cnf(p2$_{19}$, negated_conjecture)
$(p_{13}(x_7,x_8)$ and $p_{13}(x_7,x_9)) \Rightarrow p_{13}(x_8,x_9)$ cnf(p13$_{20}$, negated_conjecture)
$(p_4(x_{28},x_{26})$ and $p_4(x_{29},x_{27})$ and $p_{21}(x_{28},x_{29})) \Rightarrow p_{21}(x_{26},x_{27})$ cnf(p21$_{21}$, negated_conjecture)
$(p_{22}(x_{37},x_{36})$ and $p_4(x_{37},x_{34})$ and $p_{13}(x_{36},x_{35})) \Rightarrow p_{22}(x_{34},x_{35})$ cnf(p22$_{22}$, negated_conjecture)
$(p_{10}(x_{75},x_{77})$ and $p_2(x_{74},x_{76})) \Rightarrow p_7(f_{11}(x_{74},x_{75}),f_{11}(x_{76},x_{77}))$ cnf(p7$_{23}$, negated_conjecture)
$(p_2(x_3,x_5)$ and $p_2(x_4,x_6)) \Rightarrow p_{10}(f_{12}(x_3,x_4),f_{12}(x_5,x_6))$ cnf(p10$_{24}$, negated_conjecture)
$(p_4(x_{41},x_{43})$ and $p_4(x_{42},x_{44})) \Rightarrow p_4(f_{15}(x_{41},x_{42}),f_{15}(x_{43},x_{44}))$ cnf(p4$_{25}$, negated_conjecture)
$(p_4(x_{48},x_{50})$ and $p_7(x_{47},x_{49})) \Rightarrow p_4(f_{19}(x_{47},x_{48}),f_{19}(x_{49},x_{50}))$ cnf(p4$_{26}$, negated_conjecture)
$(p_4(x_{61},x_{63})$ and $p_4(x_{62},x_{64})) \Rightarrow p_4(f_6(x_{61},x_{62}),f_6(x_{63},x_{64}))$ cnf(p4$_{27}$, negated_conjecture)
$p_2(x_{15},f_3(c_{24}))$ or $p_{22}(f_{20}(x_{17},x_{15},x_{18},x_{16}),f_{14}(f_{11}(x_{17},f_{12}(x_{15},x_{18}))))$ cnf(p2$_{28}$, negated_conjecture)
$(p_7(x_{65},x_{68})$ and $p_8(x_{66},x_{69})$ and $p_4(x_{67},x_{70})) \Rightarrow p_4(f_9(x_{65},x_{66},x_{67}),f_9(x_{68},x_{69},x_{70}))$ cnf(p4$_{29}$, negated_conjecture)
$(p_2(x_{53},x_{57})$ and $p_4(x_{54},x_{58})$ and $p_2(x_{51},x_{55})$ and $p_2(x_{52},x_{56})) \Rightarrow p_4(f_{20}(x_{51},x_{52},x_{53},x_{54}),f_{20}(x_{55},x_{56},x_{57},x_{58}))$ cnf(p
$p_{22}(x_{33},f_{14}(f_{11}(c_{25},f_{12}(c_{23},c_{26})))) \Rightarrow p_{21}(f_5(f_6(c_{27},f_9(f_{11}(c_{25},f_{12}(c_{23},c_{26})),c_{28},c_{27}))),f_5(f_6(c_{27},x_{33})))$ cnf(p21$_{31}$, negat
$\neg p_{21}(f_5(f_6(c_{27},f_9(f_{11}(c_{25},f_{12}(c_{23},c_{26})),c_{28},c_{27}))),f_{15}(f_{19}(f_{11}(c_{25},f_{12}(c_{23},c_{26})),c_{27}),f_{16}(f_3(f_{17}(f_{18}(c_{24}))))))$ cnf(not_p21
$p_{22}(x_{19},f_{14}(f_{11}(x_{17},f_{12}(x_{15},x_{18})))) \Rightarrow (p_2(x_{15},f_3(c_{24}))$ or $p_{21}(f_5(f_6(x_{16},f_{20}(x_{17},x_{15},x_{18},x_{16}))),f_5(f_6(x_{16},x_{19}))))$ cnf(p
$p_2(x_{15},f_3(c_{24}))$ or $p_{21}(f_5(f_6(x_{16},f_{20}(x_{17},x_{15},x_{18},x_{16}))),f_{15}(f_{19}(f_{11}(x_{17},f_{12}(x_{15},x_{18})),x_{16}),f_{16}(f_3(f_{17}(f_{18}(c_{24}))))))$ cnf(

SYN622-1.p Harrison problem 4012
$p_{11}(x_0,x_0)$ cnf(p11$_1$, negated_conjecture)
$p_9(x_{60},x_{60})$ cnf(p9$_2$, negated_conjecture)
$p_8(x_{36},x_{36})$ cnf(p8$_3$, negated_conjecture)
$p_3(x_{25},x_{25})$ cnf(p3$_4$, negated_conjecture)
$p_2(x_9,x_9)$ cnf(p2$_5$, negated_conjecture)
$p_3(f_4(c_{23}),c_{24})$ cnf(p3$_6$, negated_conjecture)
$p_{19}(f_5(f_6(f_7(c_{25}))),c_{24})$ cnf(p19$_7$, negated_conjecture)
$p_8(f_{16}(x_{50},f_{17}(x_{51},x_{50})),x_{51})$ cnf(p8$_8$, negated_conjecture)
$(p_{21}(x_{18})$ and $p_{11}(x_{18},x_{17})) \Rightarrow p_{21}(x_{17})$ cnf(p21$_9$, negated_conjecture)
$p_2(x_3,x_4) \Rightarrow p_{11}(f_{13}(x_3),f_{13}(x_4))$ cnf(p11$_{10}$, negated_conjecture)
$p_3(x_{65},x_{66}) \Rightarrow p_9(f_{15}(x_{65}),f_{15}(x_{66}))$ cnf(p9$_{11}$, negated_conjecture)
$p_8(x_{63},x_{64}) \Rightarrow p_9(f_{10}(x_{63}),f_{10}(x_{64}))$ cnf(p9$_{12}$, negated_conjecture)
$p_9(x_{44},x_{45}) \Rightarrow p_8(f_{14}(x_{44}),f_{14}(x_{45}))$ cnf(p8$_{13}$, negated_conjecture)
$p_3(x_{34},x_{35}) \Rightarrow p_3(f_7(x_{34}),f_7(x_{35}))$ cnf(p3$_{14}$, negated_conjecture)
$p_3(x_{32},x_{33}) \Rightarrow p_3(f_6(x_{32}),f_6(x_{33}))$ cnf(p3$_{15}$, negated_conjecture)
$p_3(x_{30},x_{31}) \Rightarrow p_3(f_5(x_{30}),f_5(x_{31}))$ cnf(p3$_{16}$, negated_conjecture)
$p_2(x_{28},x_{29}) \Rightarrow p_3(f_4(x_{28}),f_4(x_{29}))$ cnf(p3$_{17}$, negated_conjecture)
$\neg p_8(f_{12}(f_{13}(c_{26}),c_{27}),f_{14}(f_{15}(f_5(c_{25}))))$ cnf(not_p8$_{18}$, negated_conjecture)
$(p_{11}(x_0,x_1)$ and $p_{11}(x_0,x_2)) \Rightarrow p_{11}(x_1,x_2)$ cnf(p11$_{19}$, negated_conjecture)
$(p_9(x_{60},x_{61})$ and $p_9(x_{60},x_{62})) \Rightarrow p_9(x_{61},x_{62})$ cnf(p9$_{20}$, negated_conjecture)
$(p_8(x_{36},x_{37})$ and $p_8(x_{36},x_{38})) \Rightarrow p_8(x_{37},x_{38})$ cnf(p8$_{21}$, negated_conjecture)
$(p_3(x_{25},x_{26})$ and $p_3(x_{25},x_{27})) \Rightarrow p_3(x_{26},x_{27})$ cnf(p3$_{22}$, negated_conjecture)
$(p_2(x_9,x_{10})$ and $p_2(x_9,x_{11})) \Rightarrow p_2(x_{10},x_{11})$ cnf(p2$_{23}$, negated_conjecture)
$p_8(f_{12}(f_{13}(c_{23}),x_{43}),f_{12}(f_{13}(c_{26}),f_{16}(c_{27},x_{43})))$ cnf(p8$_{24}$, negated_conjecture)
$p_{20}(f_{10}(f_{12}(f_{13}(c_{26}),c_{27})),f_{10}(f_{12}(f_{13}(c_{26}),x_{16})))$ cnf(p20$_{25}$, negated_conjecture)
$\neg p_8(f_{12}(f_{13}(c_{23}),f_{17}(c_{28},c_{27})),f_{12}(f_{13}(c_{26}),c_{28}))$ cnf(not_p8$_{26}$, negated_conjecture)
$(p_3(x_7,x_5)$ and $p_3(x_8,x_6)$ and $p_{19}(x_7,x_8)) \Rightarrow p_{19}(x_5,x_6)$ cnf(p19$_{27}$, negated_conjecture)
$(p_3(x_{23},x_{21})$ and $p_3(x_{24},x_{22})$ and $p_{22}(x_{23},x_{24})) \Rightarrow p_{22}(x_{21},x_{22})$ cnf(p22$_{28}$, negated_conjecture)
$(p_9(x_{14},x_{12})$ and $p_9(x_{15},x_{13})$ and $p_{20}(x_{14},x_{15})) \Rightarrow p_{20}(x_{12},x_{13})$ cnf(p20$_{29}$, negated_conjecture)
$(p_2(x_{57},x_{59})$ and $p_3(x_{56},x_{58})) \Rightarrow p_8(f_{18}(x_{56},x_{57}),f_{18}(x_{58},x_{59}))$ cnf(p8$_{30}$, negated_conjecture)
$(p_{11}(x_{39},x_{41})$ and $p_8(x_{40},x_{42})) \Rightarrow p_8(f_{12}(x_{39},x_{40}),f_{12}(x_{41},x_{42}))$ cnf(p8$_{31}$, negated_conjecture)
$(p_8(x_{46},x_{48})$ and $p_8(x_{47},x_{49})) \Rightarrow p_8(f_{16}(x_{46},x_{47}),f_{16}(x_{48},x_{49}))$ cnf(p8$_{32}$, negated_conjecture)
$(p_8(x_{52},x_{54})$ and $p_8(x_{53},x_{55})) \Rightarrow p_8(f_{17}(x_{52},x_{53}),f_{17}(x_{54},x_{55}))$ cnf(p8$_{33}$, negated_conjecture)
$(p_{22}(x_{20},c_{24})$ and $p_3(f_4(x_{19}),x_{20})) \Rightarrow (p_{21}(f_{13}(x_{19}))$ or $p_8(f_{12}(f_{13}(x_{19}),f_{18}(x_{20},x_{19})),f_{14}(f_{15}(f_5(c_{25})))))$ cnf(p21$_{34}$, nega

SYN623-1.p Harrison problem 4027
$p_{10}(x_0,x_0)$ cnf(p10$_1$, negated_conjecture)
$p_8(x_{58},x_{58})$ cnf(p8$_2$, negated_conjecture)
$p_7(x_{51},x_{51})$ cnf(p7$_3$, negated_conjecture)

$p_5(x_{48}, x_{48})$ cnf(p5$_4$, negated_conjecture)
$p_3(x_{37}, x_{37})$ cnf(p3$_5$, negated_conjecture)
$p_2(x_{30}, x_{30})$ cnf(p2$_6$, negated_conjecture)
$p_{17}(x_{23}, x_{23})$ cnf(p17$_7$, negated_conjecture)
$p_{14}(x_{10}, x_{10})$ cnf(p14$_8$, negated_conjecture)
$p_{12}(x_3, x_3)$ cnf(p12$_9$, negated_conjecture)
$p_{18}(c_{26}, c_{25})$ cnf(p18$_{10}$, negated_conjecture)
$p_3(c_{22}, c_{23})$ cnf(p3$_{11}$, negated_conjecture)
$p_2(c_{24}, c_{25})$ cnf(p2$_{12}$, negated_conjecture)
$\neg\, p_{16}(c_{22}, c_{21})$ cnf(not_p16$_{13}$, negated_conjecture)
$p_3(c_{23}, f_4(c_{24}, c_{20}))$ cnf(p3$_{14}$, negated_conjecture)
$p_{16}(f_4(c_{19}, c_{20}), c_{21})$ cnf(p16$_{15}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{16}$, negated_conjecture)
$(p_8(x_{58}, x_{59})$ and $p_8(x_{58}, x_{60})) \Rightarrow p_8(x_{59}, x_{60})$ cnf(p8$_{17}$, negated_conjecture)
$(p_7(x_{51}, x_{52})$ and $p_7(x_{51}, x_{53})) \Rightarrow p_7(x_{52}, x_{53})$ cnf(p7$_{18}$, negated_conjecture)
$(p_5(x_{48}, x_{49})$ and $p_5(x_{48}, x_{50})) \Rightarrow p_5(x_{49}, x_{50})$ cnf(p5$_{19}$, negated_conjecture)
$(p_3(x_{37}, x_{38})$ and $p_3(x_{37}, x_{39})) \Rightarrow p_3(x_{38}, x_{39})$ cnf(p3$_{20}$, negated_conjecture)
$(p_2(x_{30}, x_{31})$ and $p_2(x_{30}, x_{32})) \Rightarrow p_2(x_{31}, x_{32})$ cnf(p2$_{21}$, negated_conjecture)
$(p_{17}(x_{23}, x_{24})$ and $p_{17}(x_{23}, x_{25})) \Rightarrow p_{17}(x_{24}, x_{25})$ cnf(p17$_{22}$, negated_conjecture)
$(p_{14}(x_{10}, x_{11})$ and $p_{14}(x_{10}, x_{12})) \Rightarrow p_{14}(x_{11}, x_{12})$ cnf(p14$_{23}$, negated_conjecture)
$(p_{12}(x_3, x_4)$ and $p_{12}(x_3, x_5)) \Rightarrow p_{12}(x_4, x_5)$ cnf(p12$_{24}$, negated_conjecture)
$p_{16}(f_4(f_6(c_{27}, c_{25}), x_{21}), x_{22}) \Rightarrow p_{16}(f_4(c_{25}, x_{21}), x_{22})$ cnf(p16$_{25}$, negated_conjecture)
$(p_3(x_{15}, x_{13})$ and $p_8(x_{16}, x_{14})$ and $p_{16}(x_{15}, x_{16})) \Rightarrow p_{16}(x_{13}, x_{14})$ cnf(p16$_{26}$, negated_conjecture)
$(p_{18}(x_{28}, x_{29})$ and $p_2(x_{29}, x_{27})$ and $p_{17}(x_{28}, x_{26})) \Rightarrow p_{18}(x_{26}, x_{27})$ cnf(p18$_{27}$, negated_conjecture)
$(p_2(x_{62}, x_{64})$ and $p_7(x_{61}, x_{63})) \Rightarrow p_8(f_9(x_{61}, x_{62}), f_9(x_{63}, x_{64}))$ cnf(p8$_{28}$, negated_conjecture)
$(p_{14}(x_6, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_{12}(f_{15}(x_6, x_7), f_{15}(x_8, x_9))$ cnf(p12$_{29}$, negated_conjecture)
$(p_2(x_{34}, x_{36})$ and $p_5(x_{33}, x_{35})) \Rightarrow p_2(f_6(x_{33}, x_{34}), f_6(x_{35}, x_{36}))$ cnf(p2$_{30}$, negated_conjecture)
$(p_{12}(x_{40}, x_{42})$ and $p_2(x_{41}, x_{43})) \Rightarrow p_3(f_{13}(x_{40}, x_{41}), f_{13}(x_{42}, x_{43}))$ cnf(p3$_{31}$, negated_conjecture)
$(p_2(x_{44}, x_{46})$ and $p_3(x_{45}, x_{47})) \Rightarrow p_3(f_4(x_{44}, x_{45}), f_4(x_{46}, x_{47}))$ cnf(p3$_{32}$, negated_conjecture)
$(p_{10}(x_{54}, x_{56})$ and $p_2(x_{55}, x_{57})) \Rightarrow p_7(f_{11}(x_{54}, x_{55}), f_{11}(x_{56}, x_{57}))$ cnf(p7$_{33}$, negated_conjecture)
$(p_2(x_{17}, x_{20})$ and $p_{18}(c_{26}, x_{20})$ and $p_{16}(f_4(c_{19}, x_{18}), x_{19})$ and $p_{16}(f_4(x_{20}, f_{13}(f_{15}(c_{28}, x_{17}), x_{20})), f_9(f_{11}(c_{29}, x_{17}), x_{20}))) \Rightarrow$
$p_{16}(f_4(x_{17}, x_{18}), x_{19})$ cnf(p16$_{34}$, negated_conjecture)
$(p_2(x_{17}, x_{20})$ and $p_{18}(c_{26}, x_{20})$ and $p_{16}(f_4(c_{19}, x_{18}), x_{19})) \Rightarrow (p_{16}(f_4(x_{17}, x_{18}), x_{19})$ or $p_{16}(f_4(f_6(c_{27}, x_{20}), f_{13}(f_{15}(c_{28}, x_{17}), x_2$

SYN624-1.p Harrison problem 4028
$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_5(x_{57}, x_{57})$ cnf(p5$_2$, negated_conjecture)
$p_3(x_{46}, x_{46})$ cnf(p3$_3$, negated_conjecture)
$p_2(x_{34}, x_{34})$ cnf(p2$_4$, negated_conjecture)
$p_{11}(x_{21}, x_{21})$ cnf(p11$_5$, negated_conjecture)
$\neg\, p_{18}(f_6(c_{24}))$ cnf(f6_is_not_p18$_6$, negated_conjecture)
$\neg\, p_{18}(f_6(c_{22}))$ cnf(f6_is_not_p18$_7$, negated_conjecture)
$p_3(f_4(c_{22}), c_{23})$ cnf(p3$_8$, negated_conjecture)
$p_{19}(f_7(f_8(f_9(c_{25}))), c_{23})$ cnf(p19$_9$, negated_conjecture)
$(p_{18}(x_{29})$ and $p_5(x_{29}, x_{28})) \Rightarrow p_{18}(x_{28})$ cnf(p18$_{10}$, negated_conjecture)
$p_{10}(f_{16}(x_{16}, f_{14}(f_{15}(f_7(c_{25})))), x_{16})$ cnf(p10$_{11}$, negated_conjecture)
$p_{11}(x_{10}, x_{11}) \Rightarrow p_{10}(f_{14}(x_{10}), f_{14}(x_{11}))$ cnf(p10$_{12}$, negated_conjecture)
$p_2(x_{60}, x_{61}) \Rightarrow p_5(f_6(x_{60}), f_6(x_{61}))$ cnf(p5$_{13}$, negated_conjecture)
$p_3(x_{55}, x_{56}) \Rightarrow p_3(f_9(x_{55}), f_9(x_{56}))$ cnf(p3$_{14}$, negated_conjecture)
$p_3(x_{53}, x_{54}) \Rightarrow p_3(f_8(x_{53}), f_8(x_{54}))$ cnf(p3$_{15}$, negated_conjecture)
$p_3(x_{51}, x_{52}) \Rightarrow p_3(f_7(x_{51}), f_7(x_{52}))$ cnf(p3$_{16}$, negated_conjecture)
$p_2(x_{49}, x_{50}) \Rightarrow p_3(f_4(x_{49}), f_4(x_{50}))$ cnf(p3$_{17}$, negated_conjecture)
$p_3(x_{26}, x_{27}) \Rightarrow p_{11}(f_{15}(x_{26}), f_{15}(x_{27}))$ cnf(p11$_{18}$, negated_conjecture)
$p_{10}(x_{24}, x_{25}) \Rightarrow p_{11}(f_{12}(x_{24}), f_{12}(x_{25}))$ cnf(p11$_{19}$, negated_conjecture)
$\neg\, p_{10}(f_{13}(f_6(c_{24}), c_{26}), f_{14}(f_{15}(f_7(c_{25}))))$ cnf(not_p10$_{20}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{21}$, negated_conjecture)
$(p_5(x_{57}, x_{58})$ and $p_5(x_{57}, x_{59})) \Rightarrow p_5(x_{58}, x_{59})$ cnf(p5$_{22}$, negated_conjecture)
$(p_3(x_{46}, x_{47})$ and $p_3(x_{46}, x_{48})) \Rightarrow p_3(x_{47}, x_{48})$ cnf(p3$_{23}$, negated_conjecture)
$(p_2(x_{34}, x_{35})$ and $p_2(x_{34}, x_{36})) \Rightarrow p_2(x_{35}, x_{36})$ cnf(p2$_{24}$, negated_conjecture)
$(p_{11}(x_{21}, x_{22})$ and $p_{11}(x_{21}, x_{23})) \Rightarrow p_{11}(x_{22}, x_{23})$ cnf(p11$_{25}$, negated_conjecture)

$p_{10}(f_{13}(f_6(c_{22}), x_9), f_{13}(f_6(c_{24}), f_{16}(c_{26}, x_9)))$ cnf(p10$_{26}$, negated_conjecture)
$p_{20}(f_{12}(f_{13}(f_6(c_{24}), c_{26})), f_{12}(f_{13}(f_6(c_{24}), x_{41})))$ cnf(p20$_{27}$, negated_conjecture)
$\neg\, p_{10}(f_{13}(f_6(c_{24}), c_{26}), f_{13}(f_6(c_{22}), f_{14}(f_{15}(f_7(c_{25})))))$ cnf(not_p10$_{28}$, negated_conjecture)
$(p_3(x_{44}, x_{42})$ and $p_3(x_{45}, x_{43})$ and $p_{21}(x_{44}, x_{45})) \Rightarrow p_{21}(x_{42}, x_{43})$ cnf(p21$_{29}$, negated_conjecture)
$(p_3(x_{32}, x_{30})$ and $p_3(x_{33}, x_{31})$ and $p_{19}(x_{32}, x_{33})) \Rightarrow p_{19}(x_{30}, x_{31})$ cnf(p19$_{30}$, negated_conjecture)
$(p_{11}(x_{40}, x_{38})$ and $p_{20}(x_{39}, x_{40})$ and $p_{11}(x_{39}, x_{37})) \Rightarrow p_{20}(x_{37}, x_{38})$ cnf(p20$_{31}$, negated_conjecture)
$(p_{10}(x_4, x_6)$ and $p_5(x_3, x_5)) \Rightarrow p_{10}(f_{13}(x_3, x_4), f_{13}(x_5, x_6))$ cnf(p10$_{32}$, negated_conjecture)
$(p_2(x_{18}, x_{20})$ and $p_3(x_{17}, x_{19})) \Rightarrow p_{10}(f_{17}(x_{17}, x_{18}), f_{17}(x_{19}, x_{20}))$ cnf(p10$_{33}$, negated_conjecture)
$(p_{10}(x_{12}, x_{14})$ and $p_{10}(x_{13}, x_{15})) \Rightarrow p_{10}(f_{16}(x_{12}, x_{13}), f_{16}(x_{14}, x_{15}))$ cnf(p10$_{34}$, negated_conjecture)
$(p_{21}(x_8, c_{23})$ and $p_3(f_4(x_7), x_8)) \Rightarrow (p_{18}(f_6(x_7))$ or $p_{10}(f_{13}(f_6(x_7), f_{17}(x_8, x_7)), f_{14}(f_{15}(f_7(c_{25})))))$ cnf(p18$_{35}$, negated_con

SYN625-1.p Harrison problem 4030
$p_{15}(c_{21})$ cnf(c21_is_p15$_1$, negated_conjecture)
$p_{10}(x_0, x_0)$ cnf(p10$_2$, negated_conjecture)
$p_8(x_{71}, x_{71})$ cnf(p8$_3$, negated_conjecture)
$p_6(x_{68}, x_{68})$ cnf(p6$_4$, negated_conjecture)
$p_5(x_{47}, x_{47})$ cnf(p5$_5$, negated_conjecture)
$p_3(x_{40}, x_{40})$ cnf(p3$_6$, negated_conjecture)
$p_2(x_{33}, x_{33})$ cnf(p2$_7$, negated_conjecture)
$\neg\, p_{15}(f_4(f_7(c_{19}, c_{20}), c_{21}))$ cnf(f4_is_not_p15$_8$, negated_conjecture)
$p_5(x_{15}, x_{16}) \Rightarrow p_{16}(x_{14}, x_{15}, x_{16})$ cnf(p16$_9$, negated_conjecture)
$p_{15}(x_7) \Rightarrow \neg\, p_{18}(f_9(x_7), x_{76}, x_{76})$ cnf(not_p15$_{10}$, negated_conjecture)
$(p_{15}(x_6)$ and $p_3(x_6, x_5)) \Rightarrow p_{15}(x_5)$ cnf(p15$_{11}$, negated_conjecture)
$p_6(x_3, x_4) \Rightarrow p_{10}(f_{11}(x_3), f_{11}(x_4))$ cnf(p10$_{12}$, negated_conjecture)
$p_3(x_{74}, x_{75}) \Rightarrow p_8(f_9(x_{74}), f_9(x_{75}))$ cnf(p8$_{13}$, negated_conjecture)
$p_3(x_{66}, x_{67}) \Rightarrow p_5(f_{14}(x_{66}), f_{14}(x_{67}))$ cnf(p5$_{14}$, negated_conjecture)
$p_{15}(x_7)$ or $p_{18}(f_9(x_7), f_{14}(x_7), f_{14}(x_7))$ cnf(p15$_{15}$, negated_conjecture)
$p_{17}(x_{77}, f_{11}(c_{20})) \Rightarrow \neg\, p_{16}(f_9(c_{21}), x_{77}, c_{19})$ cnf(not_p17$_{16}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{17}$, negated_conjecture)
$(p_8(x_{71}, x_{72})$ and $p_8(x_{71}, x_{73})) \Rightarrow p_8(x_{72}, x_{73})$ cnf(p8$_{18}$, negated_conjecture)
$(p_6(x_{68}, x_{69})$ and $p_6(x_{68}, x_{70})) \Rightarrow p_6(x_{69}, x_{70})$ cnf(p6$_{19}$, negated_conjecture)
$(p_5(x_{47}, x_{48})$ and $p_5(x_{47}, x_{49})) \Rightarrow p_5(x_{48}, x_{49})$ cnf(p5$_{20}$, negated_conjecture)
$(p_3(x_{40}, x_{41})$ and $p_3(x_{40}, x_{42})) \Rightarrow p_3(x_{41}, x_{42})$ cnf(p3$_{21}$, negated_conjecture)
$(p_2(x_{33}, x_{34})$ and $p_2(x_{33}, x_{35})) \Rightarrow p_2(x_{34}, x_{35})$ cnf(p2$_{22}$, negated_conjecture)
$(p_{16}(x_{14}, x_{15}, x_{17})$ and $p_{16}(x_{14}, x_{17}, x_{16})) \Rightarrow p_{16}(x_{14}, x_{15}, x_{16})$ cnf(p16$_{23}$, negated_conjecture)
$(p_{17}(x_{26}, x_{25})$ and $p_5(x_{26}, x_{23})$ and $p_{10}(x_{25}, x_{24})) \Rightarrow p_{17}(x_{23}, x_{24})$ cnf(p17$_{24}$, negated_conjecture)
$(p_2(x_{43}, x_{45})$ and $p_3(x_{44}, x_{46})) \Rightarrow p_3(f_4(x_{43}, x_{44}), f_4(x_{45}, x_{46}))$ cnf(p3$_{25}$, negated_conjecture)
$(p_5(x_{36}, x_{38})$ and $p_6(x_{37}, x_{39})) \Rightarrow p_2(f_7(x_{36}, x_{37}), f_7(x_{38}, x_{39}))$ cnf(p2$_{26}$, negated_conjecture)
$p_{16}(x_{14}, x_{15}, x_{16}) \Rightarrow (p_5(x_{15}, x_{16})$ or $p_{16}(x_{14}, x_{15}, f_{13}(x_{14}, x_{15}, x_{16})))$ cnf(p5$_{27}$, negated_conjecture)
$p_{16}(x_{14}, x_{15}, x_{16}) \Rightarrow (p_5(x_{15}, x_{16})$ or $p_{16}(x_{14}, f_{13}(x_{14}, x_{15}, x_{16}), x_{16}))$ cnf(p5$_{28}$, negated_conjecture)
$(p_8(x_{11}, x_8)$ and $p_5(x_{13}, x_{10})$ and $p_5(x_{12}, x_9)$ and $p_{16}(x_{11}, x_{12}, x_{13})) \Rightarrow p_{16}(x_8, x_9, x_{10})$ cnf(p16$_{29}$, negated_conjecture)
$(p_8(x_{30}, x_{27})$ and $p_5(x_{32}, x_{29})$ and $p_5(x_{31}, x_{28})$ and $p_{18}(x_{30}, x_{31}, x_{32})) \Rightarrow p_{18}(x_{27}, x_{28}, x_{29})$ cnf(p18$_{30}$, negated_conjecture)
$(p_5(x_{62}, x_{65})$ and $p_8(x_{60}, x_{63})$ and $p_5(x_{61}, x_{64})) \Rightarrow p_5(f_{13}(x_{60}, x_{61}, x_{62}), f_{13}(x_{63}, x_{64}, x_{65}))$ cnf(p5$_{31}$, negated_conjecture)
$p_{18}(f_9(f_4(f_7(x_{20}, x_{22}), x_{18})), x_{19}, x_{21}) \Rightarrow (p_{16}(f_9(x_{18}), x_{19}, x_{20})$ or $p_{18}(f_9(x_{18}), x_{19}, x_{21}))$ cnf(p16$_{32}$, negated_conjecture)
$p_{18}(f_9(f_4(f_7(x_{20}, x_{22}), x_{18})), x_{19}, x_{21}) \Rightarrow (p_{18}(f_9(x_{18}), x_{19}, x_{21})$ or $p_{17}(f_{12}(x_{18}, x_{20}, x_{22}, x_{19}, x_{21}), f_{11}(x_{22})))$ cnf(p18$_{33}$, neg
$p_{18}(f_9(f_4(f_7(x_{20}, x_{22}), x_{18})), x_{19}, x_{21}) \Rightarrow (p_{18}(f_9(x_{18}), x_{19}, x_{21})$ or $p_{16}(f_9(x_{18}), f_{12}(x_{18}, x_{20}, x_{22}, x_{19}, x_{21}), x_{21}))$ cnf(p18$_{34}$
$(p_5(x_{54}, x_{59})$ and $p_6(x_{52}, x_{57})$ and $p_3(x_{50}, x_{55})$ and $p_5(x_{51}, x_{56})$ and $p_5(x_{53}, x_{58})) \Rightarrow p_5(f_{12}(x_{50}, x_{51}, x_{52}, x_{53}, x_{54}), f_{12}(x_{55}, x_5$

SYN626-1.p Harrison problem 4045
$p_{11}(x_0, x_0)$ cnf(p11$_1$, negated_conjecture)
$p_7(x_{54}, x_{54})$ cnf(p7$_2$, negated_conjecture)
$p_6(x_{47}, x_{47})$ cnf(p6$_3$, negated_conjecture)
$p_3(x_{38}, x_{38})$ cnf(p3$_4$, negated_conjecture)
$p_2(x_{33}, x_{33})$ cnf(p2$_5$, negated_conjecture)
$p_{11}(f_{13}(f_{12}(x_5)), x_5)$ cnf(p11$_6$, negated_conjecture)
$p_{14}(f_4(f_5(c_{20})), f_4(c_{21}))$ cnf(p14$_7$, negated_conjecture)
$p_{15}(x_{14}, x_{15}) \Rightarrow p_{16}(x_{14}, x_{15})$ cnf(p16$_8$, negated_conjecture)
$p_{15}(c_{22}, f_8(f_5(c_{20}), f_9(c_{23}, c_{24})))$ cnf(p15$_9$, negated_conjecture)
$p_7(f_{12}(f_{13}(x_{20})), x_{20}) \Rightarrow p_{16}(c_{22}, x_{20})$ cnf(p16$_{10}$, negated_conjecture)
$p_7(x_3, x_4) \Rightarrow p_{11}(f_{13}(x_3), f_{13}(x_4))$ cnf(p11$_{11}$, negated_conjecture)

$p_{11}(x_{57}, x_{58}) \Rightarrow p_7(f_{12}(x_{57}), f_{12}(x_{58}))$ cnf(p7$_{12}$, negated_conjecture)
$p_2(x_{45}, x_{46}) \Rightarrow p_3(f_4(x_{45}), f_4(x_{46}))$ cnf(p3$_{13}$, negated_conjecture)
$p_2(x_{36}, x_{37}) \Rightarrow p_2(f_5(x_{36}), f_5(x_{37}))$ cnf(p2$_{14}$, negated_conjecture)
$p_{16}(c_{22}, x_{20}) \Rightarrow p_7(f_{12}(f_{13}(x_{20})), x_{20})$ cnf(p7$_{15}$, negated_conjecture)
$(p_{11}(x_0, x_1)$ and $p_{11}(x_0, x_2)) \Rightarrow p_{11}(x_1, x_2)$ cnf(p11$_{16}$, negated_conjecture)
$(p_7(x_{54}, x_{55})$ and $p_7(x_{54}, x_{56})) \Rightarrow p_7(x_{55}, x_{56})$ cnf(p7$_{17}$, negated_conjecture)
$(p_6(x_{47}, x_{48})$ and $p_6(x_{47}, x_{49})) \Rightarrow p_6(x_{48}, x_{49})$ cnf(p6$_{18}$, negated_conjecture)
$(p_3(x_{38}, x_{39})$ and $p_3(x_{38}, x_{40})) \Rightarrow p_3(x_{39}, x_{40})$ cnf(p3$_{19}$, negated_conjecture)
$(p_2(x_{33}, x_{34})$ and $p_2(x_{33}, x_{35})) \Rightarrow p_2(x_{34}, x_{35})$ cnf(p2$_{20}$, negated_conjecture)
$(p_{16}(x_{14}, x_{15})$ and $p_{19}(x_{14}, x_{15})) \Rightarrow p_{15}(x_{14}, x_{15})$ cnf(p15$_{21}$, negated_conjecture)
$(p_{16}(x_{14}, x_{15})$ and $p_{18}(x_{14}, x_{15})) \Rightarrow p_{15}(x_{14}, x_{15})$ cnf(p15$_{22}$, negated_conjecture)
$(p_{16}(x_{14}, x_{15})$ and $p_{17}(x_{14}, x_{15})) \Rightarrow p_{15}(x_{14}, x_{15})$ cnf(p15$_{23}$, negated_conjecture)
$\neg p_{15}(c_{22}, f_{12}(f_{13}(f_8(f_5(c_{20}), f_9(c_{23}, c_{24})))))$ cnf(not_p15$_{24}$, negated_conjecture)
$p_{15}(x_{14}, x_{15}) \Rightarrow (p_{17}(x_{14}, x_{15})$ or $p_{18}(x_{14}, x_{15})$ or $p_{19}(x_{14}, x_{15}))$ cnf(p17$_{25}$, negated_conjecture)
$(p_3(x_8, x_6)$ and $p_3(x_9, x_7)$ and $p_{14}(x_8, x_9)) \Rightarrow p_{14}(x_6, x_7)$ cnf(p14$_{26}$, negated_conjecture)
$(p_6(x_{31}, x_{29})$ and $p_7(x_{32}, x_{30})$ and $p_{19}(x_{31}, x_{32})) \Rightarrow p_{19}(x_{29}, x_{30})$ cnf(p19$_{27}$, negated_conjecture)
$(p_6(x_{27}, x_{25})$ and $p_7(x_{28}, x_{26})$ and $p_{18}(x_{27}, x_{28})) \Rightarrow p_{18}(x_{25}, x_{26})$ cnf(p18$_{28}$, negated_conjecture)
$(p_6(x_{23}, x_{21})$ and $p_7(x_{24}, x_{22})$ and $p_{17}(x_{23}, x_{24})) \Rightarrow p_{17}(x_{21}, x_{22})$ cnf(p17$_{29}$, negated_conjecture)
$(p_6(x_{18}, x_{16})$ and $p_7(x_{19}, x_{17})$ and $p_{16}(x_{18}, x_{19})) \Rightarrow p_{16}(x_{16}, x_{17})$ cnf(p16$_{30}$, negated_conjecture)
$(p_6(x_{12}, x_{10})$ and $p_7(x_{13}, x_{11})$ and $p_{15}(x_{12}, x_{13})) \Rightarrow p_{15}(x_{10}, x_{11})$ cnf(p15$_{31}$, negated_conjecture)
$p_3(f_{10}(c_{22}, f_{12}(f_{13}(f_8(f_5(c_{20}), f_9(c_{23}, c_{24}))))), f_4(c_{21}))$ cnf(p3$_{32}$, negated_conjecture)
$(p_2(x_{59}, x_{61})$ and $p_6(x_{60}, x_{62})) \Rightarrow p_7(f_8(x_{59}, x_{60}), f_8(x_{61}, x_{62}))$ cnf(p7$_{33}$, negated_conjecture)
$(p_6(x_{41}, x_{43})$ and $p_7(x_{42}, x_{44})) \Rightarrow p_3(f_{10}(x_{41}, x_{42}), f_{10}(x_{43}, x_{44}))$ cnf(p3$_{34}$, negated_conjecture)
$(p_2(x_{51}, x_{53})$ and $p_2(x_{50}, x_{52})) \Rightarrow p_6(f_9(x_{50}, x_{51}), f_9(x_{52}, x_{53}))$ cnf(p6$_{35}$, negated_conjecture)

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$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_8(x_{70}, x_{70})$ cnf(p8$_2$, negated_conjecture)
$p_6(x_{67}, x_{67})$ cnf(p6$_3$, negated_conjecture)
$p_5(x_{64}, x_{64})$ cnf(p5$_4$, negated_conjecture)
$p_3(x_{40}, x_{40})$ cnf(p3$_5$, negated_conjecture)
$p_2(x_{33}, x_{33})$ cnf(p2$_6$, negated_conjecture)
$p_{15}(c_{18}, c_{19})$ cnf(p15$_7$, negated_conjecture)
$\neg p_3(c_{23}, c_{24})$ cnf(not_p3$_8$, negated_conjecture)
$p_3(c_{23}, f_4(f_7(c_{17}, c_{18}), c_{21}))$ cnf(p3$_9$, negated_conjecture)
$p_{16}(c_{17}, c_{20}, f_9(c_{19}, c_{18}), c_{21}, c_{22})$ cnf(p16$_{10}$, negated_conjecture)
$p_6(x_{55}, x_{56}) \Rightarrow p_3(f_{14}(x_{55}), f_{14}(x_{56}))$ cnf(p3$_{11}$, negated_conjecture)
$p_{10}(x_7, x_8) \Rightarrow p_{10}(f_{12}(x_7), f_{12}(x_8))$ cnf(p10$_{12}$, negated_conjecture)
$p_6(x_{53}, x_{54}) \Rightarrow p_3(f_{13}(x_{53}), f_{13}(x_{54}))$ cnf(p3$_{13}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{14}$, negated_conjecture)
$(p_8(x_{70}, x_{71})$ and $p_8(x_{70}, x_{72})) \Rightarrow p_8(x_{71}, x_{72})$ cnf(p8$_{15}$, negated_conjecture)
$(p_6(x_{67}, x_{68})$ and $p_6(x_{67}, x_{69})) \Rightarrow p_6(x_{68}, x_{69})$ cnf(p6$_{16}$, negated_conjecture)
$(p_5(x_{64}, x_{65})$ and $p_5(x_{64}, x_{66})) \Rightarrow p_5(x_{65}, x_{66})$ cnf(p5$_{17}$, negated_conjecture)
$(p_3(x_{40}, x_{41})$ and $p_3(x_{40}, x_{42})) \Rightarrow p_3(x_{41}, x_{42})$ cnf(p3$_{18}$, negated_conjecture)
$(p_2(x_{33}, x_{34})$ and $p_2(x_{33}, x_{35})) \Rightarrow p_2(x_{34}, x_{35})$ cnf(p2$_{19}$, negated_conjecture)
$p_{15}(x_{32}, c_{19}) \Rightarrow p_3(c_{24}, f_4(f_7(c_{17}, x_{32}), f_{14}(x_{32})))$ cnf(p3$_{20}$, negated_conjecture)
$p_{15}(x_{31}, c_{19}) \Rightarrow p_3(c_{23}, f_4(f_7(c_{17}, x_{31}), f_{13}(x_{31})))$ cnf(p3$_{21}$, negated_conjecture)
$p_{15}(x_{31}, c_{19}) \Rightarrow p_{16}(c_{17}, c_{20}, f_9(c_{19}, x_{31}), f_{13}(x_{31}), c_{22})$ cnf(p16$_{22}$, negated_conjecture)
$p_{15}(x_{32}, c_{19}) \Rightarrow p_{16}(c_{17}, c_{20}, f_9(c_{19}, x_{32}), f_{14}(x_{32}), c_{25})$ cnf(p16$_{23}$, negated_conjecture)
$(p_6(x_{14}, x_{12})$ and $p_8(x_{15}, x_{13})$ and $p_{15}(x_{14}, x_{15})) \Rightarrow p_{15}(x_{12}, x_{13})$ cnf(p15$_{24}$, negated_conjecture)
$(p_6(x_{74}, x_{76})$ and $p_8(x_{73}, x_{75})) \Rightarrow p_8(f_9(x_{73}, x_{74}), f_9(x_{75}, x_{76}))$ cnf(p8$_{25}$, negated_conjecture)
$(p_5(x_{36}, x_{38})$ and $p_6(x_{37}, x_{39})) \Rightarrow p_2(f_7(x_{36}, x_{37}), f_7(x_{38}, x_{39}))$ cnf(p2$_{26}$, negated_conjecture)
$(p_2(x_{57}, x_{59})$ and $p_3(x_{58}, x_{60})) \Rightarrow p_3(f_4(x_{57}, x_{58}), f_4(x_{59}, x_{60}))$ cnf(p3$_{27}$, negated_conjecture)
$(p_{16}(c_{17}, c_{20}, x_4, x_6, x_3)$ and $p_{16}(c_{17}, c_{20}, x_4, x_5, c_{22})) \Rightarrow p_3(x_5, x_6)$ cnf(p3$_{28}$, negated_conjecture)
$(p_{16}(c_{17}, c_{20}, x_4, x_6, x_3)$ and $p_{16}(c_{17}, c_{20}, x_4, x_5, c_{22})) \Rightarrow p_{10}(c_{22}, x_3)$ cnf(p10$_{29}$, negated_conjecture)
$(p_{16}(c_{17}, c_{20}, x_9, x_{11}, c_{25})$ and $p_{16}(c_{17}, c_{20}, x_9, x_{10}, f_{12}(c_{22}))) \Rightarrow p_3(x_{10}, x_{11})$ cnf(p3$_{30}$, negated_conjecture)
$(p_{16}(c_{17}, c_{20}, x_9, x_{11}, c_{25})$ and $p_{16}(c_{17}, c_{20}, x_9, x_{10}, f_{12}(c_{22}))) \Rightarrow p_{10}(f_{12}(c_{22}), c_{25})$ cnf(p10$_{31}$, negated_conjecture)
$p_6(x_{61}, x_{62})$ or $p_3(f_4(f_7(c_{17}, x_{61}), f_4(f_7(c_{17}, x_{62}), x_{63})), f_4(f_7(c_{17}, x_{62}), f_4(f_7(c_{17}, x_{61}), x_{63})))$ cnf(p6$_{32}$, negated_conjecture)
$(p_{15}(x_{28}, x_{27})$ and $p_{16}(c_{17}, x_{26}, x_{27}, x_{30}, f_{12}(x_{29}))) \Rightarrow p_3(x_{30}, f_4(f_7(c_{17}, x_{28}), f_{11}(x_{26}, x_{29}, x_{27}, x_{30}, x_{28})))$ cnf(p3$_{33}$, negated
$(p_{15}(x_{28}, x_{27})$ and $p_{16}(c_{17}, x_{26}, x_{27}, x_{30}, f_{12}(x_{29}))) \Rightarrow p_{16}(c_{17}, x_{26}, f_9(x_{27}, x_{28}), f_{11}(x_{26}, x_{29}, x_{27}, x_{30}, x_{28}), x_{29})$ cnf(p16$_{34}$, n

$(p_8(x_{24}, x_{18})$ and $p_5(x_{22}, x_{16})$ and $p_3(x_{25}, x_{19})$ and $p_3(x_{23}, x_{17})$ and $p_{10}(x_{21}, x_{20})$ and $p_{16}(x_{22}, x_{23}, x_{24}, x_{25}, x_{21})) \Rightarrow p_{16}(x_{16}, x_{17}, x_{18}, x_{19}, x_{20})$ cnf(p16$_{35}$, negated_conjecture)
$(p_6(x_{47}, x_{52})$ and $p_8(x_{45}, x_{50})$ and $p_{10}(x_{44}, x_{49})$ and $p_3(x_{43}, x_{48})$ and $p_3(x_{46}, x_{51})) \Rightarrow p_3(f_{11}(x_{43}, x_{44}, x_{45}, x_{46}, x_{47}), f_{11}(x_{48}, x$

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$p_2(x_4, x_4)$ cnf(p2$_1$, negated_conjecture)
$p_9(x_{40}, x_{40})$ cnf(p9$_2$, negated_conjecture)
$p_6(x_{33}, x_{33})$ cnf(p6$_3$, negated_conjecture)
$p_5(x_{24}, x_{24})$ cnf(p5$_4$, negated_conjecture)
$p_3(x_{19}, x_{19})$ cnf(p3$_5$, negated_conjecture)
$p_9(c_{28}, c_{22})$ cnf(p9$_6$, negated_conjecture)
$p_{20}(c_{22}, c_{28})$ cnf(p20$_7$, negated_conjecture)
$p_{20}(c_{28}, c_{26})$ cnf(p20$_8$, negated_conjecture)
$p_{21}(c_{27}, c_{22})$ cnf(p21$_9$, negated_conjecture)
$p_{19}(c_{22}, f_4(f_7(c_{23}, f_8(c_{24}, c_{25}))))$ cnf(p19$_{10}$, negated_conjecture)
$p_{19}(c_{27}, f_4(f_7(c_{23}, f_8(c_{24}, c_{25}))))$ cnf(p19$_{11}$, negated_conjecture)
$p_{19}(c_{26}, f_4(f_7(c_{23}, f_8(c_{24}, c_{25}))))$ cnf(p19$_{12}$, negated_conjecture)
$p_9(x_{53}, x_{54}) \Rightarrow p_9(f_{16}(x_{53}), f_{16}(x_{54}))$ cnf(p9$_{13}$, negated_conjecture)
$p_2(x_{22}, x_{23}) \Rightarrow p_3(f_4(x_{22}), f_4(x_{23}))$ cnf(p3$_{14}$, negated_conjecture)
$p_5(x_{27}, x_{28}) \Rightarrow p_5(f_{12}(x_{27}), f_{12}(x_{28}))$ cnf(p5$_{15}$, negated_conjecture)
$p_5(x_{29}, x_{30}) \Rightarrow p_5(f_{13}(x_{29}), f_{13}(x_{30}))$ cnf(p5$_{16}$, negated_conjecture)
$p_5(x_{31}, x_{32}) \Rightarrow p_5(f_{14}(x_{31}), f_{14}(x_{32}))$ cnf(p5$_{17}$, negated_conjecture)
$p_5(x_{47}, x_{48}) \Rightarrow p_9(f_{11}(x_{47}), f_{11}(x_{48}))$ cnf(p9$_{18}$, negated_conjecture)
$(p_2(x_4, x_5)$ and $p_2(x_4, x_6)) \Rightarrow p_2(x_5, x_6)$ cnf(p2$_{19}$, negated_conjecture)
$(p_9(x_{40}, x_{41})$ and $p_9(x_{40}, x_{42})) \Rightarrow p_9(x_{41}, x_{42})$ cnf(p9$_{20}$, negated_conjecture)
$(p_6(x_{33}, x_{34})$ and $p_6(x_{33}, x_{35})) \Rightarrow p_6(x_{34}, x_{35})$ cnf(p6$_{21}$, negated_conjecture)
$(p_5(x_{24}, x_{25})$ and $p_5(x_{24}, x_{26})) \Rightarrow p_5(x_{25}, x_{26})$ cnf(p5$_{22}$, negated_conjecture)
$(p_3(x_{19}, x_{20})$ and $p_3(x_{19}, x_{21})) \Rightarrow p_3(x_{20}, x_{21})$ cnf(p3$_{23}$, negated_conjecture)
$(p_3(x_3, x_1)$ and $p_9(x_2, x_0)$ and $p_{19}(x_2, x_3)) \Rightarrow p_{19}(x_0, x_1)$ cnf(p19$_{24}$, negated_conjecture)
$(p_9(x_{17}, x_{15})$ and $p_9(x_{18}, x_{16})$ and $p_{21}(x_{17}, x_{18})) \Rightarrow p_{21}(x_{15}, x_{16})$ cnf(p21$_{25}$, negated_conjecture)
$(p_9(x_{13}, x_{11})$ and $p_9(x_{14}, x_{12})$ and $p_{20}(x_{13}, x_{14})) \Rightarrow p_{20}(x_{11}, x_{12})$ cnf(p20$_{26}$, negated_conjecture)
$(p_5(x_7, x_9)$ and $p_6(x_8, x_{10})) \Rightarrow p_2(f_7(x_7, x_8), f_7(x_9, x_{10}))$ cnf(p2$_{27}$, negated_conjecture)
$(p_9(x_{59}, x_{61})$ and $p_9(x_{60}, x_{62})) \Rightarrow p_9(f_{18}(x_{59}, x_{60}), f_{18}(x_{61}, x_{62}))$ cnf(p9$_{28}$, negated_conjecture)
$(p_9(x_{55}, x_{57})$ and $p_9(x_{56}, x_{58})) \Rightarrow p_9(f_{17}(x_{55}, x_{56}), f_{17}(x_{57}, x_{58}))$ cnf(p9$_{29}$, negated_conjecture)
$(p_2(x_{49}, x_{51})$ and $p_9(x_{50}, x_{52})) \Rightarrow p_9(f_{15}(x_{49}, x_{50}), f_{15}(x_{51}, x_{52}))$ cnf(p9$_{30}$, negated_conjecture)
$(p_9(x_{43}, x_{45})$ and $p_9(x_{44}, x_{46})) \Rightarrow p_9(f_{10}(x_{43}, x_{44}), f_{10}(x_{45}, x_{46}))$ cnf(p9$_{31}$, negated_conjecture)
$(p_5(x_{36}, x_{38})$ and $p_5(x_{37}, x_{39})) \Rightarrow p_6(f_8(x_{36}, x_{37}), f_8(x_{38}, x_{39}))$ cnf(p6$_{32}$, negated_conjecture)
$(p_{21}(x_{63}, c_{26})$ and $p_{21}(c_{22}, x_{63})) \Rightarrow \neg p_{19}(x_{63}, f_4(f_7(c_{23}, f_8(c_{24}, c_{25}))))$ cnf(not_p21$_{33}$, negated_conjecture)
$p_{20}(f_{16}(f_{17}(c_{28}, c_{27})), f_{10}(f_{15}(f_7(c_{23}, f_8(c_{24}, c_{25})), c_{28}), f_{11}(f_{12}(f_{13}(f_{14}(c_{29})))))$ cnf(p20$_{34}$, negated_conjecture)
$\neg p_{20}(f_{16}(f_{17}(c_{22}, c_{27})), f_{10}(f_{15}(f_7(c_{23}, f_8(c_{24}, c_{25})), c_{22}), f_{11}(f_{12}(f_{13}(f_{14}(c_{29})))))$ cnf(not_p20$_{35}$, negated_conjecture)
$p_{20}(f_{15}(f_7(c_{23}, f_8(c_{24}, c_{25})), c_{28}), f_{18}(f_{11}(f_{12}(f_{13}(f_{14}(c_{29})))), f_{15}(f_7(c_{23}, f_8(c_{24}, c_{25})), c_{22})))$ cnf(p20$_{36}$, negated_conjecture)

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$p_2(x_4, x_4)$ cnf(p2$_1$, negated_conjecture)
$p_9(x_{40}, x_{40})$ cnf(p9$_2$, negated_conjecture)
$p_6(x_{33}, x_{33})$ cnf(p6$_3$, negated_conjecture)
$p_5(x_{24}, x_{24})$ cnf(p5$_4$, negated_conjecture)
$p_3(x_{19}, x_{19})$ cnf(p3$_5$, negated_conjecture)
$p_9(c_{28}, c_{26})$ cnf(p9$_6$, negated_conjecture)
$p_{20}(c_{22}, c_{28})$ cnf(p20$_7$, negated_conjecture)
$p_{20}(c_{28}, c_{26})$ cnf(p20$_8$, negated_conjecture)
$p_{21}(c_{26}, c_{27})$ cnf(p21$_9$, negated_conjecture)
$p_{19}(c_{22}, f_4(f_7(c_{23}, f_8(c_{24}, c_{25}))))$ cnf(p19$_{10}$, negated_conjecture)
$p_{19}(c_{27}, f_4(f_7(c_{23}, f_8(c_{24}, c_{25}))))$ cnf(p19$_{11}$, negated_conjecture)
$p_{19}(c_{26}, f_4(f_7(c_{23}, f_8(c_{24}, c_{25}))))$ cnf(p19$_{12}$, negated_conjecture)
$p_9(x_{53}, x_{54}) \Rightarrow p_9(f_{16}(x_{53}), f_{16}(x_{54}))$ cnf(p9$_{13}$, negated_conjecture)
$p_2(x_{22}, x_{23}) \Rightarrow p_3(f_4(x_{22}), f_4(x_{23}))$ cnf(p3$_{14}$, negated_conjecture)
$p_5(x_{27}, x_{28}) \Rightarrow p_5(f_{12}(x_{27}), f_{12}(x_{28}))$ cnf(p5$_{15}$, negated_conjecture)
$p_5(x_{29}, x_{30}) \Rightarrow p_5(f_{13}(x_{29}), f_{13}(x_{30}))$ cnf(p5$_{16}$, negated_conjecture)
$p_5(x_{31}, x_{32}) \Rightarrow p_5(f_{14}(x_{31}), f_{14}(x_{32}))$ cnf(p5$_{17}$, negated_conjecture)

$p_5(x_{47}, x_{48}) \Rightarrow p_9(f_{11}(x_{47}), f_{11}(x_{48}))$ cnf(p9$_{18}$, negated_conjecture)
$(p_2(x_4, x_5)$ and $p_2(x_4, x_6)) \Rightarrow p_2(x_5, x_6)$ cnf(p2$_{19}$, negated_conjecture)
$(p_9(x_{40}, x_{41})$ and $p_9(x_{40}, x_{42})) \Rightarrow p_9(x_{41}, x_{42})$ cnf(p9$_{20}$, negated_conjecture)
$(p_6(x_{33}, x_{34})$ and $p_6(x_{33}, x_{35})) \Rightarrow p_6(x_{34}, x_{35})$ cnf(p6$_{21}$, negated_conjecture)
$(p_5(x_{24}, x_{25})$ and $p_5(x_{24}, x_{26})) \Rightarrow p_5(x_{25}, x_{26})$ cnf(p5$_{22}$, negated_conjecture)
$(p_3(x_{19}, x_{20})$ and $p_3(x_{19}, x_{21})) \Rightarrow p_3(x_{20}, x_{21})$ cnf(p3$_{23}$, negated_conjecture)
$(p_3(x_3, x_1)$ and $p_9(x_2, x_0)$ and $p_{19}(x_2, x_3)) \Rightarrow p_{19}(x_0, x_1)$ cnf(p19$_{24}$, negated_conjecture)
$(p_9(x_{17}, x_{15})$ and $p_9(x_{18}, x_{16})$ and $p_{21}(x_{17}, x_{18})) \Rightarrow p_{21}(x_{15}, x_{16})$ cnf(p21$_{25}$, negated_conjecture)
$(p_9(x_{13}, x_{11})$ and $p_9(x_{14}, x_{12})$ and $p_{20}(x_{13}, x_{14})) \Rightarrow p_{20}(x_{11}, x_{12})$ cnf(p20$_{26}$, negated_conjecture)
$(p_5(x_7, x_9)$ and $p_6(x_8, x_{10})) \Rightarrow p_2(f_7(x_7, x_8), f_7(x_9, x_{10}))$ cnf(p2$_{27}$, negated_conjecture)
$(p_9(x_{59}, x_{61})$ and $p_9(x_{60}, x_{62})) \Rightarrow p_9(f_{18}(x_{59}, x_{60}), f_{18}(x_{61}, x_{62}))$ cnf(p9$_{28}$, negated_conjecture)
$(p_9(x_{55}, x_{57})$ and $p_9(x_{56}, x_{58})) \Rightarrow p_9(f_{17}(x_{55}, x_{56}), f_{17}(x_{57}, x_{58}))$ cnf(p9$_{29}$, negated_conjecture)
$(p_2(x_{49}, x_{51})$ and $p_9(x_{50}, x_{52})) \Rightarrow p_9(f_{15}(x_{49}, x_{50}), f_{15}(x_{51}, x_{52}))$ cnf(p9$_{30}$, negated_conjecture)
$(p_9(x_{43}, x_{45})$ and $p_9(x_{44}, x_{46})) \Rightarrow p_9(f_{10}(x_{43}, x_{44}), f_{10}(x_{45}, x_{46}))$ cnf(p9$_{31}$, negated_conjecture)
$(p_5(x_{36}, x_{38})$ and $p_5(x_{37}, x_{39})) \Rightarrow p_6(f_8(x_{36}, x_{37}), f_8(x_{38}, x_{39}))$ cnf(p6$_{32}$, negated_conjecture)
$(p_{21}(x_{63}, c_{26})$ and $p_{21}(c_{22}, x_{63})) \Rightarrow \neg p_{19}(x_{63}, f_4(f_7(c_{23}, f_8(c_{24}, c_{25}))))$ cnf(not_p21$_{33}$, negated_conjecture)
$p_{20}(f_{16}(f_{17}(c_{28}, c_{27})), f_{10}(f_{15}(f_7(c_{23}, f_8(c_{24}, c_{25})), c_{28}), f_{11}(f_{12}(f_{13}(f_{14}(c_{29}))))))$ cnf(p20$_{34}$, negated_conjecture)
$\neg p_{20}(f_{16}(f_{17}(c_{26}, c_{27})), f_{10}(f_{15}(f_7(c_{23}, f_8(c_{24}, c_{25})), c_{26}), f_{11}(f_{12}(f_{13}(f_{14}(c_{29}))))))$ cnf(not_p20$_{35}$, negated_conjecture)
$p_{20}(f_{15}(f_7(c_{23}, f_8(c_{24}, c_{25})), c_{28}), f_{18}(f_{11}(f_{12}(f_{13}(f_{14}(c_{29})))), f_{15}(f_7(c_{23}, f_8(c_{24}, c_{25})), c_{26})))$ cnf(p20$_{36}$, negated_conjecture)

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$p_{10}(x_0, x_0)$ cnf(p10$_1$, negated_conjecture)
$p_9(x_{74}, x_{74})$ cnf(p9$_2$, negated_conjecture)
$p_7(x_{65}, x_{65})$ cnf(p7$_3$, negated_conjecture)
$p_6(x_{62}, x_{62})$ cnf(p6$_4$, negated_conjecture)
$p_5(x_{37}, x_{37})$ cnf(p5$_5$, negated_conjecture)
$p_3(x_{32}, x_{32})$ cnf(p3$_6$, negated_conjecture)
$p_2(x_{12}, x_{12})$ cnf(p2$_7$, negated_conjecture)
$p_{12}(x_5, x_5)$ cnf(p12$_8$, negated_conjecture)
$p_{22}(c_{25}, c_{28})$ cnf(p22$_9$, negated_conjecture)
$p_5(f_{17}(f_{18}(x_{48}, x_{49})), x_{48})$ cnf(p5$_{10}$, negated_conjecture)
$p_5(f_{16}(f_{18}(x_{44}, x_{45})), x_{45})$ cnf(p5$_{11}$, negated_conjecture)
$p_{23}(f_{13}(c_{27}, f_{14}(c_{28})), f_{11}(f_{15}(c_{24})))$ cnf(p23$_{12}$, negated_conjecture)
$\neg p_{23}(f_{13}(f_{16}(c_{27}), f_{14}(c_{28})), f_{11}(c_{24}))$ cnf(not_p23$_{13}$, negated_conjecture)
$p_9(x_{77}, x_{78}) \Rightarrow p_9(f_{15}(x_{77}), f_{15}(x_{78}))$ cnf(p9$_{14}$, negated_conjecture)
$p_9(x_3, x_4) \Rightarrow p_{10}(f_{11}(x_3), f_{11}(x_4))$ cnf(p10$_{15}$, negated_conjecture)
$p_2(x_{35}, x_{36}) \Rightarrow p_3(f_4(x_{35}), f_4(x_{36}))$ cnf(p3$_{16}$, negated_conjecture)
$p_6(x_{40}, x_{41}) \Rightarrow p_5(f_{14}(x_{40}), f_{14}(x_{41}))$ cnf(p5$_{17}$, negated_conjecture)
$p_5(x_{42}, x_{43}) \Rightarrow p_5(f_{16}(x_{42}), f_{16}(x_{43}))$ cnf(p5$_{18}$, negated_conjecture)
$p_5(x_{46}, x_{47}) \Rightarrow p_5(f_{17}(x_{46}), f_{17}(x_{47}))$ cnf(p5$_{19}$, negated_conjecture)
$p_5(x_{60}, x_{61}) \Rightarrow p_5(f_{20}(x_{60}), f_{20}(x_{61}))$ cnf(p5$_{20}$, negated_conjecture)
$(p_{10}(x_0, x_1)$ and $p_{10}(x_0, x_2)) \Rightarrow p_{10}(x_1, x_2)$ cnf(p10$_{21}$, negated_conjecture)
$(p_9(x_{74}, x_{75})$ and $p_9(x_{74}, x_{76})) \Rightarrow p_9(x_{75}, x_{76})$ cnf(p9$_{22}$, negated_conjecture)
$(p_7(x_{65}, x_{66})$ and $p_7(x_{65}, x_{67})) \Rightarrow p_7(x_{66}, x_{67})$ cnf(p7$_{23}$, negated_conjecture)
$(p_6(x_{62}, x_{63})$ and $p_6(x_{62}, x_{64})) \Rightarrow p_6(x_{63}, x_{64})$ cnf(p6$_{24}$, negated_conjecture)
$(p_5(x_{37}, x_{38})$ and $p_5(x_{37}, x_{39})) \Rightarrow p_5(x_{38}, x_{39})$ cnf(p5$_{25}$, negated_conjecture)
$(p_3(x_{32}, x_{33})$ and $p_3(x_{32}, x_{34})) \Rightarrow p_3(x_{33}, x_{34})$ cnf(p3$_{26}$, negated_conjecture)
$(p_2(x_{12}, x_{13})$ and $p_2(x_{12}, x_{14})) \Rightarrow p_2(x_{13}, x_{14})$ cnf(p2$_{27}$, negated_conjecture)
$(p_{12}(x_5, x_6)$ and $p_{12}(x_5, x_7)) \Rightarrow p_{12}(x_6, x_7)$ cnf(p12$_{28}$, negated_conjecture)
$(p_{12}(x_{28}, x_{25})$ and $p_{23}(x_{28}, x_{27})$ and $p_{10}(x_{27}, x_{26})) \Rightarrow p_{23}(x_{25}, x_{26})$ cnf(p23$_{29}$, negated_conjecture)
$(p_3(x_{18}, x_{16})$ and $p_7(x_{17}, x_{15})$ and $p_{21}(x_{17}, x_{18})) \Rightarrow p_{21}(x_{15}, x_{16})$ cnf(p21$_{30}$, negated_conjecture)
$(p_3(x_{23}, x_{21})$ and $p_6(x_{24}, x_{22})$ and $p_{22}(x_{23}, x_{24})) \Rightarrow p_{22}(x_{21}, x_{22})$ cnf(p22$_{31}$, negated_conjecture)
$(p_5(x_8, x_{10})$ and $p_5(x_9, x_{11})) \Rightarrow p_{12}(f_{13}(x_8, x_9), f_{13}(x_{10}, x_{11}))$ cnf(p12$_{32}$, negated_conjecture)
$(p_5(x_{50}, x_{52})$ and $p_5(x_{51}, x_{53})) \Rightarrow p_5(f_{18}(x_{50}, x_{51}), f_{18}(x_{52}, x_{53}))$ cnf(p5$_{33}$, negated_conjecture)
$p_{23}(f_{13}(x_{30}, x_{31}), f_{11}(f_{15}(x_{29}))) \Rightarrow p_5(x_{30}, f_{18}(f_{20}(c_{29}), f_{19}(x_{29}, x_{30}, x_{31})))$ cnf(p5$_{34}$, negated_conjecture)
$p_{23}(f_{13}(x_{30}, x_{31}), f_{11}(f_{15}(x_{29}))) \Rightarrow p_{23}(f_{13}(f_{19}(x_{29}, x_{30}, x_{31}), x_{31}), f_{11}(x_{29}))$ cnf(p23$_{35}$, negated_conjecture)
$(p_{22}(c_{25}, x_{20})$ and $p_{23}(f_{13}(x_{19}, f_{14}(x_{20})), f_{11}(c_{24}))) \Rightarrow p_{21}(f_8(c_{26}, x_{19}, x_{20}), f_4(c_{26}))$ cnf(p21$_{36}$, negated_conjecture)
$(p_5(x_{69}, x_{72})$ and $p_6(x_{70}, x_{73})$ and $p_2(x_{68}, x_{71})) \Rightarrow p_7(f_8(x_{68}, x_{69}, x_{70}), f_8(x_{71}, x_{72}, x_{73}))$ cnf(p7$_{37}$, negated_conjecture)
$(p_5(x_{56}, x_{59})$ and $p_9(x_{54}, x_{57})$ and $p_5(x_{55}, x_{58})) \Rightarrow p_5(f_{19}(x_{54}, x_{55}, x_{56}), f_{19}(x_{57}, x_{58}, x_{59}))$ cnf(p5$_{38}$, negated_conjecture)

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$p_{11}(x_0, x_0)$ cnf(p11$_1$, negated_conjecture)
$p_9(x_{70}, x_{70})$ cnf(p9$_2$, negated_conjecture)
$p_8(x_{67}, x_{67})$ cnf(p8$_3$, negated_conjecture)
$p_6(x_{60}, x_{60})$ cnf(p6$_4$, negated_conjecture)
$p_4(x_{53}, x_{53})$ cnf(p4$_5$, negated_conjecture)
$p_3(x_{46}, x_{46})$ cnf(p3$_6$, negated_conjecture)
$p_2(x_{27}, x_{27})$ cnf(p2$_7$, negated_conjecture)
$p_{19}(x_{24}, x_{24})$ cnf(p19$_8$, negated_conjecture)
$p_{17}(x_{17}, x_{17})$ cnf(p17$_9$, negated_conjecture)
$p_{15}(x_{10}, x_{10})$ cnf(p15$_{10}$, negated_conjecture)
$p_{13}(x_3, x_3)$ cnf(p13$_{11}$, negated_conjecture)
$(p_{11}(x_0, x_1)$ and $p_{11}(x_0, x_2)) \Rightarrow p_{11}(x_1, x_2)$ cnf(p11$_{12}$, negated_conjecture)
$(p_9(x_{70}, x_{71})$ and $p_9(x_{70}, x_{72})) \Rightarrow p_9(x_{71}, x_{72})$ cnf(p9$_{13}$, negated_conjecture)
$(p_8(x_{67}, x_{68})$ and $p_8(x_{67}, x_{69})) \Rightarrow p_8(x_{68}, x_{69})$ cnf(p8$_{14}$, negated_conjecture)
$(p_6(x_{60}, x_{61})$ and $p_6(x_{60}, x_{62})) \Rightarrow p_6(x_{61}, x_{62})$ cnf(p6$_{15}$, negated_conjecture)
$(p_4(x_{53}, x_{54})$ and $p_4(x_{53}, x_{55})) \Rightarrow p_4(x_{54}, x_{55})$ cnf(p4$_{16}$, negated_conjecture)
$(p_3(x_{46}, x_{47})$ and $p_3(x_{46}, x_{48})) \Rightarrow p_3(x_{47}, x_{48})$ cnf(p3$_{17}$, negated_conjecture)
$(p_2(x_{27}, x_{28})$ and $p_2(x_{27}, x_{29})) \Rightarrow p_2(x_{28}, x_{29})$ cnf(p2$_{18}$, negated_conjecture)
$(p_{19}(x_{24}, x_{25})$ and $p_{19}(x_{24}, x_{26})) \Rightarrow p_{19}(x_{25}, x_{26})$ cnf(p19$_{19}$, negated_conjecture)
$(p_{17}(x_{17}, x_{18})$ and $p_{17}(x_{17}, x_{19})) \Rightarrow p_{17}(x_{18}, x_{19})$ cnf(p17$_{20}$, negated_conjecture)
$(p_{15}(x_{10}, x_{11})$ and $p_{15}(x_{10}, x_{12})) \Rightarrow p_{15}(x_{11}, x_{12})$ cnf(p15$_{21}$, negated_conjecture)
$(p_{13}(x_3, x_4)$ and $p_{13}(x_3, x_5)) \Rightarrow p_{13}(x_4, x_5)$ cnf(p13$_{22}$, negated_conjecture)
$(p_3(x_{37}, x_{35})$ and $p_4(x_{36}, x_{34})$ and $p_{21}(x_{36}, x_{37})) \Rightarrow p_{21}(x_{34}, x_{35})$ cnf(p21$_{23}$, negated_conjecture)
$p_{21}(f_5(f_7(f_{10}(c_{24}, f_{12}(c_{28}, f_{12}(c_{25}, c_{26}))), c_{22}), c_{23}), c_{27})$ cnf(p21$_{24}$, negated_conjecture)
$(p_{11}(x_{73}, x_{75})$ and $p_9(x_{74}, x_{76})) \Rightarrow p_9(f_{12}(x_{73}, x_{74}), f_{12}(x_{75}, x_{76}))$ cnf(p9$_{25}$, negated_conjecture)
$(p_{15}(x_6, x_8)$ and $p_2(x_7, x_9)) \Rightarrow p_{13}(f_{16}(x_6, x_7), f_{16}(x_8, x_9))$ cnf(p13$_{26}$, negated_conjecture)
$(p_{17}(x_{13}, x_{15})$ and $p_3(x_{14}, x_{16})) \Rightarrow p_{15}(f_{18}(x_{13}, x_{14}), f_{18}(x_{15}, x_{16}))$ cnf(p15$_{27}$, negated_conjecture)
$(p_{19}(x_{20}, x_{22})$ and $p_9(x_{21}, x_{23})) \Rightarrow p_{17}(f_{20}(x_{20}, x_{21}), f_{20}(x_{22}, x_{23}))$ cnf(p17$_{28}$, negated_conjecture)
$(p_2(x_{31}, x_{33})$ and $p_6(x_{30}, x_{32})) \Rightarrow p_2(f_7(x_{30}, x_{31}), f_7(x_{32}, x_{33}))$ cnf(p2$_{29}$, negated_conjecture)
$(p_{13}(x_{49}, x_{51})$ and $p_3(x_{50}, x_{52})) \Rightarrow p_3(f_{14}(x_{49}, x_{50}), f_{14}(x_{51}, x_{52}))$ cnf(p3$_{30}$, negated_conjecture)
$(p_2(x_{56}, x_{58})$ and $p_3(x_{57}, x_{59})) \Rightarrow p_4(f_5(x_{56}, x_{57}), f_5(x_{58}, x_{59}))$ cnf(p4$_{31}$, negated_conjecture)
$(p_8(x_{63}, x_{65})$ and $p_9(x_{64}, x_{66})) \Rightarrow p_6(f_{10}(x_{63}, x_{64}), f_{10}(x_{65}, x_{66}))$ cnf(p6$_{32}$, negated_conjecture)
$p_{21}(f_5(f_7(f_{10}(c_{24}, f_{12}(c_{25}, c_{26})), x_{42}), x_{43}), x_{44}) \Rightarrow p_3(x_{43}, x_{44})$ cnf(p3$_{33}$, negated_conjecture)
$p_3(x_{43}, x_{44}) \Rightarrow p_{21}(f_5(f_7(f_{10}(c_{24}, f_{12}(c_{25}, c_{26})), x_{42}), x_{43}), x_{44})$ cnf(p21$_{34}$, negated_conjecture)
$p_{21}(f_5(c_{22}, c_{23}), x_{77}) \Rightarrow \neg p_{21}(f_5(f_7(f_{10}(c_{24}, f_{12}(c_{25}, c_{26})), c_{22}), x_{77}), c_{27})$ cnf(not_p21$_{35}$, negated_conjecture)
$p_{21}(f_5(f_7(f_{10}(c_{24}, f_{12}(c_{28}, x_{39})), x_{38}), x_{40}), x_{41}) \Rightarrow p_{21}(f_5(x_{38}, f_{14}(f_{16}(f_{18}(f_{20}(c_{29}, x_{39}), x_{40}), x_{38}), x_{41})), x_{41})$ cnf(p21$_{36}$, ne
$(p_{21}(f_5(x_{38}, x_{45}), x_{41})$ and $p_{21}(f_5(f_7(f_{10}(c_{24}, x_{39}), x_{38}), x_{40}), x_{45})) \Rightarrow p_{21}(f_5(f_7(f_{10}(c_{24}, f_{12}(c_{28}, x_{39})), x_{38}), x_{40}), x_{41})$ cnf(
$p_{21}(f_5(f_7(f_{10}(c_{24}, f_{12}(c_{28}, x_{39})), x_{38}), x_{40}), x_{41}) \Rightarrow p_{21}(f_5(f_7(f_{10}(c_{24}, x_{39}), x_{38}), x_{40}), f_{14}(f_{16}(f_{18}(f_{20}(c_{29}, x_{39}), x_{40}), x_{38}), x_{41}))$

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$p_{15}(f_3(c_{19}))$ cnf(f3_is_p15$_1$, negated_conjecture)
$p_{15}(f_3(c_{18}))$ cnf(f3_is_p15$_2$, negated_conjecture)
$p_{11}(x_0, x_0)$ cnf(p11$_3$, negated_conjecture)
$p_6(x_{45}, x_{45})$ cnf(p6$_4$, negated_conjecture)
$p_4(x_{36}, x_{36})$ cnf(p4$_5$, negated_conjecture)
$p_2(x_{27}, x_{27})$ cnf(p2$_6$, negated_conjecture)
$p_{16}(x_{18}, x_{18})$ cnf(p16$_7$, negated_conjecture)
$p_{12}(x_3, x_3)$ cnf(p12$_8$, negated_conjecture)
$p_6(f_8(f_3(c_{19})), f_8(c_{19}))$ cnf(p6$_9$, negated_conjecture)
$p_4(f_5(f_3(c_{18})), f_5(c_{18}))$ cnf(p4$_{10}$, negated_conjecture)
$p_4(f_5(f_3(c_{19})), f_5(c_{19}))$ cnf(p4$_{11}$, negated_conjecture)
$p_6(f_7(f_3(c_{18})), f_7(c_{18}))$ cnf(p6$_{12}$, negated_conjecture)
$p_6(f_7(f_3(c_{19})), f_7(c_{19}))$ cnf(p6$_{13}$, negated_conjecture)
$p_6(f_8(f_3(c_{18})), f_8(c_{18}))$ cnf(p6$_{14}$, negated_conjecture)
$(p_{15}(x_{17})$ and $p_2(x_{17}, x_{16})) \Rightarrow p_{15}(x_{16})$ cnf(p15$_{15}$, negated_conjecture)
$p_{11}(x_6, x_7) \Rightarrow p_{12}(f_{13}(x_6), f_{13}(x_7))$ cnf(p12$_{16}$, negated_conjecture)
$p_2(x_{50}, x_{51}) \Rightarrow p_6(f_8(x_{50}), f_8(x_{51}))$ cnf(p6$_{17}$, negated_conjecture)
$p_2(x_{48}, x_{49}) \Rightarrow p_6(f_7(x_{48}), f_7(x_{49}))$ cnf(p6$_{18}$, negated_conjecture)
$p_2(x_{43}, x_{44}) \Rightarrow p_4(f_5(x_{43}), f_5(x_{44}))$ cnf(p4$_{19}$, negated_conjecture)

$p_2(x_{34}, x_{35}) \Rightarrow p_2(f_3(x_{34}), f_3(x_{35}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_{15}(f_{10}(x_{14}, x_{15}))$ cnf(p15$_{21}$, negated_conjecture)
$(p_{11}(x_0, x_1)$ and $p_{11}(x_0, x_2)) \Rightarrow p_{11}(x_1, x_2)$ cnf(p11$_{22}$, negated_conjecture)
$(p_6(x_{45}, x_{46})$ and $p_6(x_{45}, x_{47})) \Rightarrow p_6(x_{46}, x_{47})$ cnf(p6$_{23}$, negated_conjecture)
$(p_4(x_{36}, x_{37})$ and $p_4(x_{36}, x_{38})) \Rightarrow p_4(x_{37}, x_{38})$ cnf(p4$_{24}$, negated_conjecture)
$(p_2(x_{27}, x_{28})$ and $p_2(x_{27}, x_{29})) \Rightarrow p_2(x_{28}, x_{29})$ cnf(p2$_{25}$, negated_conjecture)
$(p_{16}(x_{18}, x_{19})$ and $p_{16}(x_{18}, x_{20})) \Rightarrow p_{16}(x_{19}, x_{20})$ cnf(p16$_{26}$, negated_conjecture)
$(p_{12}(x_3, x_4)$ and $p_{12}(x_3, x_5)) \Rightarrow p_{12}(x_4, x_5)$ cnf(p12$_{27}$, negated_conjecture)
$\neg p_6(f_7(f_{10}(f_3(c_{19}), f_3(c_{18}))), f_9(f_7(c_{19}), f_7(c_{18})))$ cnf(not_p6$_{28}$, negated_conjecture)
$p_{17}(x_8, x_9, f_3(c_{19})) \Rightarrow (p_{12}(f_{13}(x_8), c_{20})$ or $p_{17}(x_8, x_9, c_{19}))$ cnf(p12$_{29}$, negated_conjecture)
$p_{17}(x_{10}, x_{11}, f_3(c_{18})) \Rightarrow (p_{12}(f_{13}(x_{10}), c_{20})$ or $p_{17}(x_{10}, x_{11}, c_{18}))$ cnf(p12$_{30}$, negated_conjecture)
$p_{17}(x_8, x_9, c_{19}) \Rightarrow (p_{12}(f_{13}(x_8), c_{20})$ or $p_{17}(x_8, x_9, f_3(c_{19})))$ cnf(p12$_{31}$, negated_conjecture)
$p_{17}(x_{10}, x_{11}, c_{18}) \Rightarrow (p_{12}(f_{13}(x_{10}), c_{20})$ or $p_{17}(x_{10}, x_{11}, f_3(c_{18})))$ cnf(p12$_{32}$, negated_conjecture)
$(p_6(x_{53}, x_{55})$ and $p_6(x_{52}, x_{54})) \Rightarrow p_6(f_9(x_{52}, x_{53}), f_9(x_{54}, x_{55}))$ cnf(p6$_{33}$, negated_conjecture)
$(p_2(x_{30}, x_{32})$ and $p_2(x_{31}, x_{33})) \Rightarrow p_2(f_{10}(x_{30}, x_{31}), f_{10}(x_{32}, x_{33}))$ cnf(p2$_{34}$, negated_conjecture)
$(p_4(x_{39}, x_{41})$ and $p_4(x_{40}, x_{42})) \Rightarrow p_4(f_{14}(x_{39}, x_{40}), f_{14}(x_{41}, x_{42}))$ cnf(p4$_{35}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_6(f_8(f_{10}(x_{14}, x_{15})), f_9(f_8(x_{14}), f_8(x_{15})))$ cnf(p6$_{36}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_4(f_5(f_{10}(x_{14}, x_{15})), f_{14}(f_5(x_{14}), f_5(x_{15})))$ cnf(p4$_{37}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_6(f_7(f_{10}(x_{14}, x_{15})), f_9(f_7(x_{14}), f_7(x_{15})))$ cnf(p6$_{38}$, negated_conjecture)
$(p_2(x_{26}, x_{23})$ and $p_{16}(x_{25}, x_{22})$ and $p_{11}(x_{24}, x_{21})$ and $p_{17}(x_{24}, x_{25}, x_{26})) \Rightarrow p_{17}(x_{21}, x_{22}, x_{23})$ cnf(p17$_{39}$, negated_conjectur
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12}, x_{13}, x_{14})$ or $p_{17}(x_{12}, x_{13}, f_{10}(x_{14}, x_{15})))$ cnf(p12$_{40}$, negated_conje
$(p_{15}(x_{14})$ and $p_{15}(x_{15})$ and $p_{17}(x_{12}, x_{13}, x_{15})) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12}, x_{13}, f_{10}(x_{14}, x_{15})))$ cnf(p12$_{41}$, negated_con
$(p_{15}(x_{14})$ and $p_{15}(x_{15})$ and $p_{17}(x_{12}, x_{13}, x_{14})$ and $p_{17}(x_{12}, x_{13}, f_{10}(x_{14}, x_{15}))) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12}, x_{13}, x_{15}))$

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$p_{15}(f_3(c_{19}))$ cnf(f3_is_p15$_1$, negated_conjecture)
$p_{15}(f_3(c_{18}))$ cnf(f3_is_p15$_2$, negated_conjecture)
$p_{11}(x_0, x_0)$ cnf(p11$_3$, negated_conjecture)
$p_6(x_{45}, x_{45})$ cnf(p6$_4$, negated_conjecture)
$p_4(x_{36}, x_{36})$ cnf(p4$_5$, negated_conjecture)
$p_2(x_{27}, x_{27})$ cnf(p2$_6$, negated_conjecture)
$p_{16}(x_{18}, x_{18})$ cnf(p16$_7$, negated_conjecture)
$p_{12}(x_3, x_3)$ cnf(p12$_8$, negated_conjecture)
$p_6(f_8(f_3(c_{19})), f_8(c_{19}))$ cnf(p6$_9$, negated_conjecture)
$p_4(f_5(f_3(c_{18})), f_5(c_{18}))$ cnf(p4$_{10}$, negated_conjecture)
$p_4(f_5(f_3(c_{19})), f_5(c_{19}))$ cnf(p4$_{11}$, negated_conjecture)
$p_6(f_7(f_3(c_{18})), f_7(c_{18}))$ cnf(p6$_{12}$, negated_conjecture)
$p_6(f_7(f_3(c_{19})), f_7(c_{19}))$ cnf(p6$_{13}$, negated_conjecture)
$p_6(f_8(f_3(c_{18})), f_8(c_{18}))$ cnf(p6$_{14}$, negated_conjecture)
$(p_{15}(x_{17})$ and $p_2(x_{17}, x_{16})) \Rightarrow p_{15}(x_{16})$ cnf(p15$_{15}$, negated_conjecture)
$p_{11}(x_6, x_7) \Rightarrow p_{12}(f_{13}(x_6), f_{13}(x_7))$ cnf(p12$_{16}$, negated_conjecture)
$p_2(x_{50}, x_{51}) \Rightarrow p_6(f_8(x_{50}), f_8(x_{51}))$ cnf(p6$_{17}$, negated_conjecture)
$p_2(x_{48}, x_{49}) \Rightarrow p_6(f_7(x_{48}), f_7(x_{49}))$ cnf(p6$_{18}$, negated_conjecture)
$p_2(x_{43}, x_{44}) \Rightarrow p_4(f_5(x_{43}), f_5(x_{44}))$ cnf(p4$_{19}$, negated_conjecture)
$p_2(x_{34}, x_{35}) \Rightarrow p_2(f_3(x_{34}), f_3(x_{35}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_{15}(f_{10}(x_{14}, x_{15}))$ cnf(p15$_{21}$, negated_conjecture)
$(p_{11}(x_0, x_1)$ and $p_{11}(x_0, x_2)) \Rightarrow p_{11}(x_1, x_2)$ cnf(p11$_{22}$, negated_conjecture)
$(p_6(x_{45}, x_{46})$ and $p_6(x_{45}, x_{47})) \Rightarrow p_6(x_{46}, x_{47})$ cnf(p6$_{23}$, negated_conjecture)
$(p_4(x_{36}, x_{37})$ and $p_4(x_{36}, x_{38})) \Rightarrow p_4(x_{37}, x_{38})$ cnf(p4$_{24}$, negated_conjecture)
$(p_2(x_{27}, x_{28})$ and $p_2(x_{27}, x_{29})) \Rightarrow p_2(x_{28}, x_{29})$ cnf(p2$_{25}$, negated_conjecture)
$(p_{16}(x_{18}, x_{19})$ and $p_{16}(x_{18}, x_{20})) \Rightarrow p_{16}(x_{19}, x_{20})$ cnf(p16$_{26}$, negated_conjecture)
$(p_{12}(x_3, x_4)$ and $p_{12}(x_3, x_5)) \Rightarrow p_{12}(x_4, x_5)$ cnf(p12$_{27}$, negated_conjecture)
$\neg p_6(f_8(f_{10}(f_3(c_{19}), f_3(c_{18}))), f_9(f_8(c_{19}), f_8(c_{18})))$ cnf(not_p6$_{28}$, negated_conjecture)
$p_{17}(x_8, x_9, f_3(c_{19})) \Rightarrow (p_{12}(f_{13}(x_8), c_{20})$ or $p_{17}(x_8, x_9, c_{19}))$ cnf(p12$_{29}$, negated_conjecture)
$p_{17}(x_{10}, x_{11}, f_3(c_{18})) \Rightarrow (p_{12}(f_{13}(x_{10}), c_{20})$ or $p_{17}(x_{10}, x_{11}, c_{18}))$ cnf(p12$_{30}$, negated_conjecture)
$p_{17}(x_8, x_9, c_{19}) \Rightarrow (p_{12}(f_{13}(x_8), c_{20})$ or $p_{17}(x_8, x_9, f_3(c_{19})))$ cnf(p12$_{31}$, negated_conjecture)
$p_{17}(x_{10}, x_{11}, c_{18}) \Rightarrow (p_{12}(f_{13}(x_{10}), c_{20})$ or $p_{17}(x_{10}, x_{11}, f_3(c_{18})))$ cnf(p12$_{32}$, negated_conjecture)
$(p_6(x_{53}, x_{55})$ and $p_6(x_{52}, x_{54})) \Rightarrow p_6(f_9(x_{52}, x_{53}), f_9(x_{54}, x_{55}))$ cnf(p6$_{33}$, negated_conjecture)
$(p_2(x_{30}, x_{32})$ and $p_2(x_{31}, x_{33})) \Rightarrow p_2(f_{10}(x_{30}, x_{31}), f_{10}(x_{32}, x_{33}))$ cnf(p2$_{34}$, negated_conjecture)
$(p_4(x_{39}, x_{41})$ and $p_4(x_{40}, x_{42})) \Rightarrow p_4(f_{14}(x_{39}, x_{40}), f_{14}(x_{41}, x_{42}))$ cnf(p4$_{35}$, negated_conjecture)

$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_6(f_8(f_{10}(x_{14},x_{15})), f_9(f_8(x_{14}), f_8(x_{15})))$ cnf(p6$_{36}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_4(f_5(f_{10}(x_{14},x_{15})), f_{14}(f_5(x_{14}), f_5(x_{15})))$ cnf(p4$_{37}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_6(f_7(f_{10}(x_{14},x_{15})), f_9(f_7(x_{14}), f_7(x_{15})))$ cnf(p6$_{38}$, negated_conjecture)
$(p_2(x_{26},x_{23})$ and $p_{16}(x_{25},x_{22})$ and $p_{11}(x_{24},x_{21})$ and $p_{17}(x_{24},x_{25},x_{26})) \Rightarrow p_{17}(x_{21},x_{22},x_{23})$ cnf(p17$_{39}$, negated_conjectur
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12},x_{13},x_{14})$ or $p_{17}(x_{12},x_{13},f_{10}(x_{14},x_{15})))$ cnf(p12$_{40}$, negated_conje
$(p_{15}(x_{14})$ and $p_{15}(x_{15})$ and $p_{17}(x_{12},x_{13},x_{15})) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12},x_{13},f_{10}(x_{14},x_{15})))$ cnf(p12$_{41}$, negated_con
$(p_{15}(x_{14})$ and $p_{15}(x_{15})$ and $p_{17}(x_{12},x_{13},x_{14})$ and $p_{17}(x_{12},x_{13},f_{10}(x_{14},x_{15}))) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12},x_{13},x_{15}))$

SYN643-1.p Harrison problem 4298
$p_{15}(f_3(c_{19}))$ cnf(f3_is_p15$_1$, negated_conjecture)
$p_{15}(f_3(c_{18}))$ cnf(f3_is_p15$_2$, negated_conjecture)
$p_{11}(x_0,x_0)$ cnf(p11$_3$, negated_conjecture)
$p_6(x_{45},x_{45})$ cnf(p6$_4$, negated_conjecture)
$p_4(x_{36},x_{36})$ cnf(p4$_5$, negated_conjecture)
$p_2(x_{27},x_{27})$ cnf(p2$_6$, negated_conjecture)
$p_{16}(x_{18},x_{18})$ cnf(p16$_7$, negated_conjecture)
$p_{12}(x_3,x_3)$ cnf(p12$_8$, negated_conjecture)
$p_6(f_8(f_3(c_{19})), f_8(c_{19}))$ cnf(p6$_9$, negated_conjecture)
$p_4(f_5(f_3(c_{18})), f_5(c_{18}))$ cnf(p4$_{10}$, negated_conjecture)
$p_4(f_5(f_3(c_{19})), f_5(c_{19}))$ cnf(p4$_{11}$, negated_conjecture)
$p_6(f_7(f_3(c_{18})), f_7(c_{18}))$ cnf(p6$_{12}$, negated_conjecture)
$p_6(f_7(f_3(c_{19})), f_7(c_{19}))$ cnf(p6$_{13}$, negated_conjecture)
$p_6(f_8(f_3(c_{18})), f_8(c_{18}))$ cnf(p6$_{14}$, negated_conjecture)
$(p_{15}(x_{17})$ and $p_2(x_{17},x_{16})) \Rightarrow p_{15}(x_{16})$ cnf(p15$_{15}$, negated_conjecture)
$p_{11}(x_6,x_7) \Rightarrow p_{12}(f_{13}(x_6), f_{13}(x_7))$ cnf(p12$_{16}$, negated_conjecture)
$p_2(x_{54},x_{55}) \Rightarrow p_6(f_8(x_{54}), f_8(x_{55}))$ cnf(p6$_{17}$, negated_conjecture)
$p_2(x_{52},x_{53}) \Rightarrow p_6(f_7(x_{52}), f_7(x_{53}))$ cnf(p6$_{18}$, negated_conjecture)
$p_2(x_{39},x_{40}) \Rightarrow p_4(f_5(x_{39}), f_5(x_{40}))$ cnf(p4$_{19}$, negated_conjecture)
$p_2(x_{34},x_{35}) \Rightarrow p_2(f_3(x_{34}), f_3(x_{35}))$ cnf(p2$_{20}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_{15}(f_{10}(x_{14},x_{15}))$ cnf(p15$_{21}$, negated_conjecture)
$(p_{11}(x_0,x_1)$ and $p_{11}(x_0,x_2)) \Rightarrow p_{11}(x_1,x_2)$ cnf(p11$_{22}$, negated_conjecture)
$(p_6(x_{45},x_{46})$ and $p_6(x_{45},x_{47})) \Rightarrow p_6(x_{46},x_{47})$ cnf(p6$_{23}$, negated_conjecture)
$(p_4(x_{36},x_{37})$ and $p_4(x_{36},x_{38})) \Rightarrow p_4(x_{37},x_{38})$ cnf(p4$_{24}$, negated_conjecture)
$(p_2(x_{27},x_{28})$ and $p_2(x_{27},x_{29})) \Rightarrow p_2(x_{28},x_{29})$ cnf(p2$_{25}$, negated_conjecture)
$(p_{16}(x_{18},x_{19})$ and $p_{16}(x_{18},x_{20})) \Rightarrow p_{16}(x_{19},x_{20})$ cnf(p16$_{26}$, negated_conjecture)
$(p_{12}(x_3,x_4)$ and $p_{12}(x_3,x_5)) \Rightarrow p_{12}(x_4,x_5)$ cnf(p12$_{27}$, negated_conjecture)
$\neg p_4(f_5(f_{10}(f_3(c_{19}), f_3(c_{18}))), f_9(f_5(c_{19}), f_5(c_{18})))$ cnf(not_p4$_{28}$, negated_conjecture)
$p_{17}(x_8,x_9,f_3(c_{19})) \Rightarrow (p_{12}(f_{13}(x_8), c_{20})$ or $p_{17}(x_8,x_9,c_{19}))$ cnf(p12$_{29}$, negated_conjecture)
$p_{17}(x_{10},x_{11},f_3(c_{18})) \Rightarrow (p_{12}(f_{13}(x_{10}), c_{20})$ or $p_{17}(x_{10},x_{11},c_{18}))$ cnf(p12$_{30}$, negated_conjecture)
$p_{17}(x_8,x_9,c_{19}) \Rightarrow (p_{12}(f_{13}(x_8), c_{20})$ or $p_{17}(x_8,x_9,f_3(c_{19})))$ cnf(p12$_{31}$, negated_conjecture)
$p_{17}(x_{10},x_{11},c_{18}) \Rightarrow (p_{12}(f_{13}(x_{10}), c_{20})$ or $p_{17}(x_{10},x_{11},f_3(c_{18})))$ cnf(p12$_{32}$, negated_conjecture)
$(p_6(x_{48},x_{50})$ and $p_6(x_{49},x_{51})) \Rightarrow p_6(f_{14}(x_{48},x_{49}), f_{14}(x_{50},x_{51}))$ cnf(p6$_{33}$, negated_conjecture)
$(p_2(x_{30},x_{32})$ and $p_2(x_{31},x_{33})) \Rightarrow p_2(f_{10}(x_{30},x_{31}), f_{10}(x_{32},x_{33}))$ cnf(p2$_{34}$, negated_conjecture)
$(p_4(x_{42},x_{44})$ and $p_4(x_{41},x_{43})) \Rightarrow p_4(f_9(x_{41},x_{42}), f_9(x_{43},x_{44}))$ cnf(p4$_{35}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_6(f_8(f_{10}(x_{14},x_{15})), f_{14}(f_8(x_{14}), f_8(x_{15})))$ cnf(p6$_{36}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_4(f_5(f_{10}(x_{14},x_{15})), f_9(f_5(x_{14}), f_5(x_{15})))$ cnf(p4$_{37}$, negated_conjecture)
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow p_6(f_7(f_{10}(x_{14},x_{15})), f_{14}(f_7(x_{14}), f_7(x_{15})))$ cnf(p6$_{38}$, negated_conjecture)
$(p_2(x_{26},x_{23})$ and $p_{16}(x_{25},x_{22})$ and $p_{11}(x_{24},x_{21})$ and $p_{17}(x_{24},x_{25},x_{26})) \Rightarrow p_{17}(x_{21},x_{22},x_{23})$ cnf(p17$_{39}$, negated_conjectur
$(p_{15}(x_{14})$ and $p_{15}(x_{15})) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12},x_{13},x_{14})$ or $p_{17}(x_{12},x_{13},f_{10}(x_{14},x_{15})))$ cnf(p12$_{40}$, negated_conje
$(p_{15}(x_{14})$ and $p_{15}(x_{15})$ and $p_{17}(x_{12},x_{13},x_{15})) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12},x_{13},f_{10}(x_{14},x_{15})))$ cnf(p12$_{41}$, negated_con
$(p_{15}(x_{14})$ and $p_{15}(x_{15})$ and $p_{17}(x_{12},x_{13},x_{14})$ and $p_{17}(x_{12},x_{13},f_{10}(x_{14},x_{15}))) \Rightarrow (p_{12}(f_{13}(x_{12}), c_{20})$ or $p_{17}(x_{12},x_{13},x_{15}))$

SYN720-1.p Synthetic domain theory for EBL
include('Axioms/SYN001-0.ax')

SYN721+1.p Peter Andrews Problem LX1
$(r(a,b)$ and $\forall x$: $(\exists y$: $r(x,y) \Rightarrow q(x,x))$ and $\forall u,v$: $(q(u,v) \Rightarrow \forall z$: $r(z,v))) \Rightarrow \exists w$: $(r(b,w)$ and $q(w,a))$ fof(lx$_1$, conjectur

SYN721-1.p Peter Andrews Problem LX1
$r(a,b)$ cnf(lx1$_1$, negated_conjecture)
$r(a,b) \Rightarrow q(a,a)$ cnf(lx1$_2$, negated_conjecture)

$q(a,b) \Rightarrow r(c,b)$ cnf(lx1_3, negated_conjecture)
$q(a,a) \Rightarrow \neg\, r(b,a)$ cnf(lx1_4, negated_conjecture)

SYN722+1.p Peter Andrews Problem THM119
$\neg\, \forall z$: (($p(z)$ or $r(z)$) and $q(z)$) and $\forall x$: $\exists y$: ($p(x)$ or $\neg\, q(x)$ or $\neg\, q(y)$ or $\neg\, q(c)$ or $\neg\, q(d)$) and ($\neg\, p(a)$ or $\neg\, p(b)$) fof(thm_{119}

SYN723+1.p Peter Andrews Problem THM138
$\exists x$: $\forall y$: ($p(x) \iff p(y)$) $\iff$ (($\exists x$: $q(x) \iff \forall y$: $r(y)$) $\iff$ (($\exists x$: $\forall y$: ($q(x) \iff q(y)$) $\iff$ ($\exists x$: $r(x) \iff$ $\forall y$: $s(y)$))) $\iff$ ($\exists x$: $\forall y$: ($r(x) \iff r(y)$) $\iff$ (($\exists x$: $s(x) \iff \forall y$: $p(y)$) $\iff$ ($\exists x$: $\forall y$: ($s(x) \iff s(y)$) $\iff$ ($\exists x$: $p(x) \iff \forall y$: $q(y)$))))))) fof(thm_{138}, conjecture)

SYN724+1.p Peter Andrews Problem THM31
$\forall x$: ($r(x) \Rightarrow s(x)$) $\iff$ $\forall x$: (($r(x)$ and $s(x)$) $\iff$ $r(x)$) fof(thm_{31}, conjecture)

SYN724-1.p Peter Andrews Problem THM31
$r(a) \Rightarrow s(a)$ cnf(thm31_3, negated_conjecture)
$r(\text{sk}_1)$ or $r(\text{sk}_2)$ cnf(thm31_4, negated_conjecture)
($r(\text{sk}_2)$ and $s(\text{sk}_2)$) $\Rightarrow$ $r(\text{sk}_1)$ cnf(thm31_9, negated_conjecture)
$s(\text{sk}_1) \Rightarrow r(\text{sk}_2)$ cnf(thm31_{10}, negated_conjecture)
($r(\text{sk}_2)$ and $s(\text{sk}_1)$) $\Rightarrow$ $\neg\, s(\text{sk}_2)$ cnf(thm31_{15}, negated_conjecture)

SYN725+1.p Peter Andrews Problem THM39
$\forall x$: ($r(x)$ or ($s(x) \iff$ ($r(x)$ and $s(x)$))) $\Rightarrow$ $\forall x$: ($r(x) \Rightarrow s(x)$) fof(thm_{39}, conjecture)

SYN726+1.p Peter Andrews Problem THM400
(($\forall x, y, z$: (($p(x,y)$ and $p(y,z)$) $\Rightarrow$ $p(x,z)$) and $\forall x, y, z$: (($q(x,y)$ and $q(y,z)$) $\Rightarrow$ $q(x,z)$) and $\forall x, y$: ($q(x,y) \Rightarrow$ $q(y,x)$) and $\forall x, y$: ($p(x,y)$ or $q(x,y)$)) $\Rightarrow$ $\forall x, y$: $p(x,y)$) or $\forall x, y$: $q(x,y)$ fof(thm_{400}, conjecture)

SYN726-1.p Peter Andrews Problem THM400
($p(a,b)$ and $p(b,c)$) $\Rightarrow$ $p(a,c)$ cnf(thm400_1, negated_conjecture)
($q(a,b)$ and $q(b,c)$) $\Rightarrow$ $q(a,c)$ cnf(thm400_2, negated_conjecture)
$q(a,b) \Rightarrow q(b,a)$ cnf(thm400_3, negated_conjecture)
$p(a,b)$ or $q(a,b)$ cnf(thm400_4, negated_conjecture)
$\neg\, p(\text{sk}_1, \text{sk}_2)$ cnf(thm400_5, negated_conjecture)
$\neg\, q(\text{sk}_3, \text{sk}_4)$ cnf(thm400_6, negated_conjecture)

SYN727+1.p Peter Andrews Problem THM68
($\forall x$: likes(x, bruce) and $\forall y$: ($\exists z$: likes(y, z) $\Rightarrow$ likes(lyle, y))) $\Rightarrow$ $\exists u$: $\forall v$: likes(u, v) fof(thm_{68}, conjecture)

SYN727-1.p Peter Andrews Problem THM68
likes(a, bruce) cnf(thm68_1, negated_conjecture)
likes(a, b) $\Rightarrow$ likes(lyle, a) cnf(thm68_2, negated_conjecture)
$\neg$ likes($a, \text{sk}_1(a)$) cnf(thm68_3, negated_conjecture)

SYN728+1.p Peter Andrews Problem THM69
($\forall x$: ($\exists y$: $p(x,y) \Rightarrow \forall z$: $p(z,z)$) and $\forall r$: $\exists s$: ($p(r,s)$ or ($m(r)$ and $q(f(r,s))$)) and $\forall w$: ($q(w) \Rightarrow \neg\, m(g(w))$)) $\Rightarrow$ $\forall u$: $\exists v$: ($p(g(u), v)$ and $p(u,u)$) fof(thm_{69}, conjecture)

SYN728-1.p Peter Andrews Problem THM69
$p(a,b) \Rightarrow p(c,c)$ cnf(thm69_1, negated_conjecture)
$m(a)$ or $p(a, \text{sk}_1(a))$ cnf(thm69_2, negated_conjecture)
$q(f(a, \text{sk}_1(a)))$ or $p(a, \text{sk}_1(a))$ cnf(thm69_3, negated_conjecture)
$m(g(a)) \Rightarrow \neg\, q(a)$ cnf(thm69_4, negated_conjecture)
$p(\text{sk}_2, \text{sk}_2) \Rightarrow \neg\, p(g(\text{sk}_2), a)$ cnf(thm69_5, negated_conjecture)

SYN729+1.p Peter Andrews Problem THM72
($\forall x$: $\exists y$: ($p(x) \Rightarrow$ ($l(x, g(h(y)))$ and $p(y)$)) and $\forall w$: ($p(w) \Rightarrow$ ($p(g(w))$ and $p(h(w))$))) $\Rightarrow$ $\forall x$: ($p(x) \Rightarrow$ $\exists y$: ($l(x,y)$ and $p(y)$)) fof(thm_{72}, conjecture)

SYN729-1.p Peter Andrews Problem THM72
$p(a) \Rightarrow l(a, g(h(\text{sk}_1(a))))$ cnf(thm72_1, negated_conjecture)
$p(a) \Rightarrow p(\text{sk}_1(a))$ cnf(thm72_2, negated_conjecture)
$p(a) \Rightarrow p(g(a))$ cnf(thm72_3, negated_conjecture)
$p(a) \Rightarrow p(h(a))$ cnf(thm72_4, negated_conjecture)
$p(\text{sk}_2)$ cnf(thm72_5, negated_conjecture)
$p(a) \Rightarrow \neg\, l(\text{sk}_2, a)$ cnf(thm72_6, negated_conjecture)

SYN730+1.p Peter Andrews Problem THM75

$\exists v\colon \forall j\colon \exists q\colon ((p(a,j,h(j)) \text{ or } p(v,j,k(j))) \Rightarrow p(v,j,q))$ fof(thm_{75}, conjecture)

SYN731+1.p Peter Andrews Problem X2150
$\exists w\colon (\forall x\colon \exists y\colon p(w,x,y) \Rightarrow \exists z\colon p(z,z,w))$ fof(x_{2150}, conjecture)

SYN731-1.p Peter Andrews Problem X2150
$p(a,b,\text{sk}_1(b,a))$ cnf(x2150_1, negated_conjecture)
$\neg\, p(a,a,b)$ cnf(x2150_2, negated_conjecture)

SYN731∧5.p TPS problem X2150
cP: \$i → \$i → \$i → \$o thf(cP, type)
$\exists w\colon \$i\colon (\forall x\colon \$i\colon \exists y\colon \$i\colon (\text{cP@}w\text{@}x\text{@}y) \Rightarrow \exists z\colon \$i\colon (\text{cP@}z\text{@}z\text{@}w))$ thf(cX_{2150}, conjecture)

SYN732+1.p Peter Andrews Problem X3411
$\forall y\colon (\forall x\colon p(x,y) \Rightarrow \forall u\colon q(u,y)) \Rightarrow \exists z\colon (\exists v\colon p(v,z) \Rightarrow \exists w\colon (p(z,w) \text{ or } q(w,z)))$ fof(x_{3411}, conjecture)

SYN732∧5.p TPS problem X3411
cQ: \$i → \$i → \$o thf(cQ, type)
cP: \$i → \$i → \$o thf(cP, type)
$\forall xy\colon \$i\colon (\forall xx\colon \$i\colon (\text{cP@}xx\text{@}xy) \Rightarrow \forall xu\colon \$i\colon (\text{cQ@}xu\text{@}xy)) \Rightarrow \exists xz\colon \$i\colon (\exists xv\colon \$i\colon (\text{cP@}xv\text{@}xz) \Rightarrow \exists xw\colon \$i\colon (\text{cP@}xz\text{@}xw \text{ or } \text{cQ@}x$

SYN733+1.p Peter Andrews Problem Y2141
$\forall x\colon \exists y\colon (p(x) \text{ and } (q(y) \text{ or } q(x))) \Rightarrow \exists z\colon (p(z) \text{ and } q(z))$ fof(y_{2141}, conjecture)

SYN734-1.p PSAT - K=4 C=20 V=4 D=1.2
$\text{ssRr}(u,\text{skf}_1(u))$ cnf(clause_1, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v)) \Rightarrow (\text{ssPv}_1(u) \text{ or } \text{ssPv}_2(u) \text{ or } \text{ssPv}_4(u))$ cnf(clause_2, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_3(v)) \Rightarrow (\text{ssPv}_1(u) \text{ or } \text{ssPv}_2(u) \text{ or } \text{ssPv}_3(u))$ cnf(clause_3, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_1(u) \text{ and } \text{ssPv}_2(u)) \Rightarrow (\text{ssPv}_1(v) \text{ or } \text{ssPv}_3(u))$ cnf(clause_4, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_1(u) \text{ and } \text{ssPv}_3(u) \text{ and } \text{ssPv}_4(u)) \Rightarrow \text{ssPv}_4(v)$ cnf(clause_5, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_1(v) \text{ and } \text{ssPv}_3(u) \text{ and } \text{ssPv}_4(u)) \Rightarrow \text{ssPv}_2(u)$ cnf(clause_6, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssPv}_1(u) \text{ and } \text{ssPv}_2(u)) \Rightarrow \neg\, \text{ssPv}_3(u)$ cnf(clause_7, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssRr}(u,w)) \Rightarrow (\text{ssPv}_4(v) \text{ or } \text{ssPv}_2(w) \text{ or } \text{ssPv}_1(u) \text{ or } \text{ssPv}_4(u))$ cnf(clause_8, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_2(u)) \Rightarrow (\text{ssPv}_2(v) \text{ or } \text{ssPv}_1(w) \text{ or } \text{ssPv}_4(u))$ cnf(clause_9, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssRr}(u,w)) \Rightarrow (\text{ssPv}_3(w) \text{ or } \text{ssPv}_1(u) \text{ or } \text{ssPv}_3(u))$ cnf(clause_{10}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_3(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(u)) \Rightarrow (\text{ssPv}_3(w) \text{ or } \text{ssPv}_3(u))$ cnf(clause_{11}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(u)) \Rightarrow (\text{ssPv}_1(w) \text{ or } \text{ssPv}_2(u))$ cnf(clause_{12}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_1(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_4(u)) \Rightarrow (\text{ssPv}_4(w) \text{ or } \text{ssPv}_1(u))$ cnf(clause_{13}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_4(u)) \Rightarrow (\text{ssPv}_3(w) \text{ or } \text{ssPv}_1(u))$ cnf(clause_{14}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_3(w)) \Rightarrow (\text{ssPv}_1(u) \text{ or } \text{ssPv}_2(u))$ cnf(clause_{15}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_1(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_2(u) \text{ and } \text{ssPv}_4(u)) \Rightarrow \text{ssPv}_2(w)$ cnf(clause_{16}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_3(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(w) \text{ and } \text{ssPv}_2(u)) \Rightarrow \neg\, \text{ssPv}_4(u)$ cnf(clause_{17}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssRr}(u,x) \text{ and } \text{ssPv}_4(u)) \Rightarrow (\text{ssPv}_4(v) \text{ or } \text{ssPv}_3(w) \text{ or } \text{ssPv}_1(x))$ cnf(clause_{18}, negated_co
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssRr}(u,x) \text{ and } \text{ssPv}_4(u)) \Rightarrow (\text{ssPv}_4(w) \text{ or } \text{ssPv}_3(x))$ cnf(clause_{19}, negated_c
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_3(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(w) \text{ and } \text{ssRr}(u,x)) \Rightarrow (\text{ssPv}_3(x) \text{ or } \text{ssPv}_1(u))$ cnf(clause_{20}, negated_c
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_2(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(w) \text{ and } \text{ssRr}(u,x) \text{ and } \text{ssPv}_4(u)) \Rightarrow \text{ssPv}_3(x)$ cnf(clause_{21}, negated_c

SYN735-1.p PSAT - K=4 C=20 V=4 D=1.8
$\text{ssRr}(u,\text{skf}_1(u))$ cnf(clause_1, negated_conjecture)
$\text{ssRr}(u,v) \Rightarrow (\text{ssPv}_1(v) \text{ or } \text{ssPv}_1(u) \text{ or } \text{ssPv}_3(u) \text{ or } \text{ssPv}_4(u))$ cnf(clause_2, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_2(v) \text{ and } \text{ssPv}_2(u) \text{ and } \text{ssPv}_4(u)) \Rightarrow \text{ssPv}_3(u)$ cnf(clause_3, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssRr}(u,w)) \Rightarrow (\text{ssPv}_3(v) \text{ or } \text{ssPv}_2(w) \text{ or } \text{ssPv}_1(u) \text{ or } \text{ssPv}_3(u))$ cnf(clause_4, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(u)) \Rightarrow (\text{ssPv}_4(v) \text{ or } \text{ssPv}_2(w) \text{ or } \text{ssPv}_2(u))$ cnf(clause_5, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssRr}(u,w)) \Rightarrow (\text{ssPv}_2(w) \text{ or } \text{ssPv}_2(u) \text{ or } \text{ssPv}_3(u))$ cnf(clause_6, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_2(u)) \Rightarrow (\text{ssPv}_4(v) \text{ or } \text{ssPv}_3(w) \text{ or } \text{ssPv}_1(u))$ cnf(clause_7, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(u) \text{ and } \text{ssPv}_4(u)) \Rightarrow (\text{ssPv}_4(v) \text{ or } \text{ssPv}_3(w))$ cnf(clause_8, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(u) \text{ and } \text{ssPv}_4(u)) \Rightarrow (\text{ssPv}_4(v) \text{ or } \text{ssPv}_2(w))$ cnf(clause_9, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_3(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_4(u)) \Rightarrow (\text{ssPv}_1(w) \text{ or } \text{ssPv}_2(u))$ cnf(clause_{10}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_1(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_3(u)) \Rightarrow (\text{ssPv}_3(w) \text{ or } \text{ssPv}_2(u))$ cnf(clause_{11}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(w)) \Rightarrow (\text{ssPv}_2(u) \text{ or } \text{ssPv}_3(u))$ cnf(clause_{12}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_3(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssPv}_1(u) \text{ and } \text{ssPv}_4(u)) \Rightarrow \text{ssPv}_3(w)$ cnf(clause_{13}, negated_conjecture)
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_2(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssRr}(u,x)) \Rightarrow (\text{ssPv}_4(w) \text{ or } \text{ssPv}_3(x) \text{ or } \text{ssPv}_2(u))$ cnf(clause_{14}, negated_co
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_4(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssRr}(u,x) \text{ and } \text{ssPv}_3(u)) \Rightarrow (\text{ssPv}_3(w) \text{ or } \text{ssPv}_1(x))$ cnf(clause_{15}, negated_c
$(\text{ssRr}(u,v) \text{ and } \text{ssPv}_1(v) \text{ and } \text{ssRr}(u,w) \text{ and } \text{ssRr}(u,x) \text{ and } \text{ssPv}_2(u)) \Rightarrow (\text{ssPv}_3(w) \text{ or } \text{ssPv}_2(x))$ cnf(clause_{16}, negated_c

$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_1(w)$ and $\mathrm{ssRr}(u,x)) \Rightarrow (\mathrm{ssPv}_2(x)$ or $\mathrm{ssPv}_3(u))$ $\mathrm{cnf}(\mathrm{clause}_{17}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_2(w)$ and $\mathrm{ssRr}(u,x)) \Rightarrow (\mathrm{ssPv}_3(x)$ or $\mathrm{ssPv}_2(u))$ $\mathrm{cnf}(\mathrm{clause}_{18}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssRr}(u,x)$ and $\mathrm{ssPv}_4(u)) \Rightarrow (\mathrm{ssPv}_4(w)$ or $\mathrm{ssPv}_2(x))$ $\mathrm{cnf}(\mathrm{clause}_{19}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_4(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_1(w)$ and $\mathrm{ssRr}(u,x)) \Rightarrow (\mathrm{ssPv}_2(x)$ or $\mathrm{ssPv}_1(u))$ $\mathrm{cnf}(\mathrm{clause}_{20}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_1(w)$ and $\mathrm{ssRr}(u,x)$ and $\mathrm{ssPv}_1(u)) \Rightarrow \mathrm{ssPv}_2(x)$ $\mathrm{cnf}(\mathrm{clause}_{21}, \mathrm{negated\_c}$

SYN738-1.p PSAT - K=4 C=20 V=8 D=1.8

$\mathrm{ssRr}(u, \mathrm{skf}_1(u))$ $\mathrm{cnf}(\mathrm{clause}_1, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssPv}_8(u)) \Rightarrow (\mathrm{ssPv}_4(u)$ or $\mathrm{ssPv}_5(u))$ $\mathrm{cnf}(\mathrm{clause}_2, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_5(u)$ and $\mathrm{ssPv}_8(u)) \Rightarrow (\mathrm{ssPv}_2(v)$ or $\mathrm{ssPv}_2(u))$ $\mathrm{cnf}(\mathrm{clause}_3, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssPv}_2(u)) \Rightarrow (\mathrm{ssPv}_1(u)$ or $\mathrm{ssPv}_7(u))$ $\mathrm{cnf}(\mathrm{clause}_4, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_7(v)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssPv}_4(u)) \Rightarrow \mathrm{ssPv}_6(u)$ $\mathrm{cnf}(\mathrm{clause}_5, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssRr}(u,w)) \Rightarrow (\mathrm{ssPv}_5(w)$ or $\mathrm{ssPv}_6(u)$ or $\mathrm{ssPv}_8(u))$ $\mathrm{cnf}(\mathrm{clause}_6, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_4(u)) \Rightarrow (\mathrm{ssPv}_5(v)$ or $\mathrm{ssPv}_3(w)$ or $\mathrm{ssPv}_5(u))$ $\mathrm{cnf}(\mathrm{clause}_7, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_8(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_4(w)) \Rightarrow (\mathrm{ssPv}_5(u)$ or $\mathrm{ssPv}_7(u))$ $\mathrm{cnf}(\mathrm{clause}_8, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_6(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_4(u)$ and $\mathrm{ssPv}_5(u)) \Rightarrow \mathrm{ssPv}_6(w)$ $\mathrm{cnf}(\mathrm{clause}_9, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_7(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssPv}_8(u)) \Rightarrow \mathrm{ssPv}_8(w)$ $\mathrm{cnf}(\mathrm{clause}_{10}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_7(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssPv}_8(u)) \Rightarrow \mathrm{ssPv}_7(w)$ $\mathrm{cnf}(\mathrm{clause}_{11}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_1(u)$ and $\mathrm{ssPv}_6(u)) \Rightarrow \mathrm{ssPv}_7(w)$ $\mathrm{cnf}(\mathrm{clause}_{12}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_7(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_1(u)$ and $\mathrm{ssPv}_2(u)) \Rightarrow \mathrm{ssPv}_4(w)$ $\mathrm{cnf}(\mathrm{clause}_{13}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_2(w)$ and $\mathrm{ssPv}_1(u)) \Rightarrow \mathrm{ssPv}_8(u)$ $\mathrm{cnf}(\mathrm{clause}_{14}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_5(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_2(w)$ and $\mathrm{ssPv}_2(u)) \Rightarrow \mathrm{ssPv}_7(u)$ $\mathrm{cnf}(\mathrm{clause}_{15}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_4(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_3(w)$ and $\mathrm{ssPv}_4(u)) \Rightarrow \neg\,\mathrm{ssPv}_8(u)$ $\mathrm{cnf}(\mathrm{clause}_{16}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_7(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssRr}(u,x)) \Rightarrow (\mathrm{ssPv}_8(w)$ or $\mathrm{ssPv}_3(x)$ or $\mathrm{ssPv}_4(u))$ $\mathrm{cnf}(\mathrm{clause}_{17}, \mathrm{negated\_co}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_6(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssRr}(u,x)$ and $\mathrm{ssPv}_3(u)) \Rightarrow (\mathrm{ssPv}_8(w)$ or $\mathrm{ssPv}_6(x))$ $\mathrm{cnf}(\mathrm{clause}_{18}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_5(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssRr}(u,x)$ and $\mathrm{ssPv}_5(u)) \Rightarrow (\mathrm{ssPv}_6(w)$ or $\mathrm{ssPv}_4(x))$ $\mathrm{cnf}(\mathrm{clause}_{19}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_6(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_3(w)$ and $\mathrm{ssRr}(u,x)$ and $\mathrm{ssPv}_4(u)) \Rightarrow \mathrm{ssPv}_5(x)$ $\mathrm{cnf}(\mathrm{clause}_{20}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_1(w)$ and $\mathrm{ssRr}(u,x)$ and $\mathrm{ssPv}_7(u)) \Rightarrow \mathrm{ssPv}_7(x)$ $\mathrm{cnf}(\mathrm{clause}_{21}, \mathrm{negated\_c}$

SYN768-1.p PSAT inverse problem - K=4 C=20 V=4 D=1.6

$\mathrm{ssRr}(\mathrm{skf}_3(u), u)$ $\mathrm{cnf}(\mathrm{clause}_1, \mathrm{negated\_conjecture})$
$\mathrm{ssRr}(u, \mathrm{skf}_2(u))$ $\mathrm{cnf}(\mathrm{clause}_2, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_2(u)$ and $\mathrm{ssPv}_3(u)) \Rightarrow (\mathrm{ssPv}_2(v)$ or $\mathrm{ssPv}_4(u))$ $\mathrm{cnf}(\mathrm{clause}_3, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_2(u)$ and $\mathrm{ssPv}_4(u)) \Rightarrow (\mathrm{ssPv}_1(v)$ or $\mathrm{ssPv}_3(u))$ $\mathrm{cnf}(\mathrm{clause}_4, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_2(u)$ and $\mathrm{ssPv}_1(v)) \Rightarrow (\mathrm{ssPv}_2(v)$ or $\mathrm{ssPv}_3(v))$ $\mathrm{cnf}(\mathrm{clause}_5, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_1(v)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssPv}_4(u)) \Rightarrow \mathrm{ssPv}_1(u)$ $\mathrm{cnf}(\mathrm{clause}_6, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(v,w)) \Rightarrow (\mathrm{ssPv}_2(u)$ or $\mathrm{ssPv}_4(w)$ or $\mathrm{ssPv}_1(v)$ or $\mathrm{ssPv}_3(v))$ $\mathrm{cnf}(\mathrm{clause}_7, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssPv}_4(v)) \Rightarrow (\mathrm{ssPv}_3(u)$ or $\mathrm{ssPv}_1(w)$ or $\mathrm{ssPv}_3(v))$ $\mathrm{cnf}(\mathrm{clause}_8, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_4(w)) \Rightarrow (\mathrm{ssPv}_2(u)$ or $\mathrm{ssPv}_2(v)$ or $\mathrm{ssPv}_4(v))$ $\mathrm{cnf}(\mathrm{clause}_9, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_2(u)$ and $\mathrm{ssRr}(v,w)) \Rightarrow (\mathrm{ssPv}_3(w)$ or $\mathrm{ssPv}_2(v)$ or $\mathrm{ssPv}_4(v))$ $\mathrm{cnf}(\mathrm{clause}_{10}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_1(u)$ and $\mathrm{ssPv}_3(u)) \Rightarrow (\mathrm{ssPv}_3(v)$ or $\mathrm{ssPv}_2(w))$ $\mathrm{cnf}(\mathrm{clause}_{11}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_1(u)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_1(v)) \Rightarrow (\mathrm{ssPv}_3(w)$ or $\mathrm{ssPv}_4(v))$ $\mathrm{cnf}(\mathrm{clause}_{12}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssPv}_4(v)) \Rightarrow (\mathrm{ssPv}_3(w)$ or $\mathrm{ssPv}_3(v))$ $\mathrm{cnf}(\mathrm{clause}_{13}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_2(u)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_3(v)) \Rightarrow (\mathrm{ssPv}_1(w)$ or $\mathrm{ssPv}_2(v))$ $\mathrm{cnf}(\mathrm{clause}_{14}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_2(w)$ and $\mathrm{ssPv}_3(v)) \Rightarrow \mathrm{ssPv}_2(v)$ $\mathrm{cnf}(\mathrm{clause}_{15}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_2(u)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssPv}_1(w)$ and $\mathrm{ssPv}_2(v)) \Rightarrow \neg\,\mathrm{ssPv}_4(v)$ $\mathrm{cnf}(\mathrm{clause}_{16}, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_1(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssRr}(u,x)) \Rightarrow (\mathrm{ssPv}_4(w)$ or $\mathrm{ssPv}_1(x)$ or $\mathrm{ssPv}_4(u))$ $\mathrm{cnf}(\mathrm{clause}_{17}, \mathrm{negated\_co}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_4(w)$ and $\mathrm{ssRr}(v,x)$ and $\mathrm{ssPv}_1(x)) \Rightarrow (\mathrm{ssPv}_2(u)$ or $\mathrm{ssPv}_4(v))$ $\mathrm{cnf}(\mathrm{clause}_{18}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_4(u)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssRr}(v,x)$ and $\mathrm{ssPv}_2(v)) \Rightarrow (\mathrm{ssPv}_2(w)$ or $\mathrm{ssPv}_1(x))$ $\mathrm{cnf}(\mathrm{clause}_{19}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_1(w)$ and $\mathrm{ssRr}(v,x)) \Rightarrow (\mathrm{ssPv}_4(x)$ or $\mathrm{ssPv}_2(v))$ $\mathrm{cnf}(\mathrm{clause}_{20}, \mathrm{negated\_c}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_4(u)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_3(w)$ and $\mathrm{ssRr}(v,x)$ and $\mathrm{ssPv}_1(x)) \Rightarrow \neg\,\mathrm{ssPv}_1(v)$ $\mathrm{cnf}(\mathrm{clause}_{21}, \mathrm{negated}$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_4(u)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssPv}_1(w)$ and $\mathrm{ssRr}(v,x)$ and $\mathrm{ssPv}_4(x)) \Rightarrow \neg\,\mathrm{ssPv}_4(v)$ $\mathrm{cnf}(\mathrm{clause}_{22}, \mathrm{negated}$

SYN772-1.p PSAT inverse problem - K=4 C=20 V=8 D=1.6

$\mathrm{ssRr}(\mathrm{skf}_3(u), u)$ $\mathrm{cnf}(\mathrm{clause}_1, \mathrm{negated\_conjecture})$
$\mathrm{ssRr}(u, \mathrm{skf}_2(u))$ $\mathrm{cnf}(\mathrm{clause}_2, \mathrm{negated\_conjecture})$
$\mathrm{ssRr}(u,v) \Rightarrow (\mathrm{ssPv}_3(v)$ or $\mathrm{ssPv}_3(u)$ or $\mathrm{ssPv}_5(u)$ or $\mathrm{ssPv}_8(u))$ $\mathrm{cnf}(\mathrm{clause}_3, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_7(u)) \Rightarrow (\mathrm{ssPv}_2(v)$ or $\mathrm{ssPv}_5(u)$ or $\mathrm{ssPv}_8(u))$ $\mathrm{cnf}(\mathrm{clause}_4, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_2(u)) \Rightarrow (\mathrm{ssPv}_1(v)$ or $\mathrm{ssPv}_6(v)$ or $\mathrm{ssPv}_7(v))$ $\mathrm{cnf}(\mathrm{clause}_5, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssPv}_4(u)) \Rightarrow (\mathrm{ssPv}_8(v)$ or $\mathrm{ssPv}_5(u))$ $\mathrm{cnf}(\mathrm{clause}_6, \mathrm{negated\_conjecture})$
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_1(v)$ and $\mathrm{ssPv}_4(u)) \Rightarrow (\mathrm{ssPv}_5(u)$ or $\mathrm{ssPv}_6(u))$ $\mathrm{cnf}(\mathrm{clause}_7, \mathrm{negated\_conjecture})$

$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_6(v)$ and $\mathrm{ssPv}_7(v)$ and $\mathrm{ssPv}_8(v)) \Rightarrow \mathrm{ssPv}_2(u)$ cnf(clause_8, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_4(v)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssPv}_8(u)) \Rightarrow \mathrm{ssPv}_2(u)$ cnf(clause_9, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(v,w)) \Rightarrow (\mathrm{ssPv}_8(u)$ or $\mathrm{ssPv}_6(w)$ or $\mathrm{ssPv}_4(v)$ or $\mathrm{ssPv}_8(v))$ cnf(clause_{10}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_3(u)) \Rightarrow (\mathrm{ssPv}_8(v)$ or $\mathrm{ssPv}_2(w)$ or $\mathrm{ssPv}_4(u))$ cnf(clause_{11}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_1(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_6(u)) \Rightarrow (\mathrm{ssPv}_5(w)$ or $\mathrm{ssPv}_8(u))$ cnf(clause_{12}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_5(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_5(u)) \Rightarrow (\mathrm{ssPv}_7(w)$ or $\mathrm{ssPv}_8(u))$ cnf(clause_{13}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_4(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_5(u)) \Rightarrow (\mathrm{ssPv}_3(w)$ or $\mathrm{ssPv}_7(u))$ cnf(clause_{14}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_8(u)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssPv}_8(v)) \Rightarrow (\mathrm{ssPv}_3(w)$ or $\mathrm{ssPv}_6(v))$ cnf(clause_{15}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_6(u)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssPv}_1(v)) \Rightarrow (\mathrm{ssPv}_7(w)$ or $\mathrm{ssPv}_3(v))$ cnf(clause_{16}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_3(u)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssPv}_3(v)) \Rightarrow (\mathrm{ssPv}_5(w)$ or $\mathrm{ssPv}_2(v))$ cnf(clause_{17}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_7(w)$ and $\mathrm{ssPv}_7(v)) \Rightarrow (\mathrm{ssPv}_8(u)$ or $\mathrm{ssPv}_1(v))$ cnf(clause_{18}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_6(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_5(u)$ and $\mathrm{ssPv}_7(u)) \Rightarrow \mathrm{ssPv}_8(w)$ cnf(clause_{19}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_5(u)$ and $\mathrm{ssRr}(w,v)$ and $\mathrm{ssPv}_3(w)$ and $\mathrm{ssPv}_3(v)) \Rightarrow \mathrm{ssPv}_5(v)$ cnf(clause_{20}, negated_conjecture)
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssRr}(v,w)$ and $\mathrm{ssPv}_3(w)$ and $\mathrm{ssRr}(v,x)) \Rightarrow (\mathrm{ssPv}_4(u)$ or $\mathrm{ssPv}_6(x)$ or $\mathrm{ssPv}_7(v))$ cnf(clause_{21}, negated_cor
$(\mathrm{ssRr}(u,v)$ and $\mathrm{ssPv}_5(v)$ and $\mathrm{ssRr}(u,w)$ and $\mathrm{ssPv}_4(w)$ and $\mathrm{ssRr}(u,x)$ and $\mathrm{ssPv}_6(u)) \Rightarrow \mathrm{ssPv}_7(x)$ cnf(clause_{22}, negated_c

SYN914-1.p Show that $11 > 10$

Having at least eleven elements but allowing at most 10 is a contradiction.

$x = a_1$ or $x = a_2$ or $x = a_3$ or $x = a_4$ or $x = a_5$ or $x = a_6$ or $x = a_7$ or $x = a_8$ or $x = a_9$ or $x = a_{10}$ cnf($\mathrm{at\_most}_{10}$, axiom
$b_1 \neq b_2$ cnf($\mathrm{at\_least\_11\_1}_2$, negated_conjecture)
$b_1 \neq b_3$ cnf($\mathrm{at\_least\_11\_1}_3$, negated_conjecture)
$b_1 \neq b_4$ cnf($\mathrm{at\_least\_11\_1}_4$, negated_conjecture)
$b_1 \neq b_5$ cnf($\mathrm{at\_least\_11\_1}_5$, negated_conjecture)
$b_1 \neq b_6$ cnf($\mathrm{at\_least\_11\_1}_6$, negated_conjecture)
$b_1 \neq b_7$ cnf($\mathrm{at\_least\_11\_1}_7$, negated_conjecture)
$b_1 \neq b_8$ cnf($\mathrm{at\_least\_11\_1}_8$, negated_conjecture)
$b_1 \neq b_9$ cnf($\mathrm{at\_least\_11\_1}_9$, negated_conjecture)
$b_1 \neq b_{10}$ cnf($\mathrm{at\_least\_11\_1}_{10}$, negated_conjecture)
$b_1 \neq b_{11}$ cnf($\mathrm{at\_least\_11\_1}_{11}$, negated_conjecture)
$b_2 \neq b_3$ cnf($\mathrm{at\_least\_11\_2}_3$, negated_conjecture)
$b_2 \neq b_4$ cnf($\mathrm{at\_least\_11\_2}_4$, negated_conjecture)
$b_2 \neq b_5$ cnf($\mathrm{at\_least\_11\_2}_5$, negated_conjecture)
$b_2 \neq b_6$ cnf($\mathrm{at\_least\_11\_2}_6$, negated_conjecture)
$b_2 \neq b_7$ cnf($\mathrm{at\_least\_11\_2}_7$, negated_conjecture)
$b_2 \neq b_8$ cnf($\mathrm{at\_least\_11\_2}_8$, negated_conjecture)
$b_2 \neq b_9$ cnf($\mathrm{at\_least\_11\_2}_9$, negated_conjecture)
$b_2 \neq b_{10}$ cnf($\mathrm{at\_least\_11\_2}_{10}$, negated_conjecture)
$b_2 \neq b_{11}$ cnf($\mathrm{at\_least\_11\_2}_{11}$, negated_conjecture)
$b_3 \neq b_4$ cnf($\mathrm{at\_least\_11\_3}_4$, negated_conjecture)
$b_3 \neq b_5$ cnf($\mathrm{at\_least\_11\_3}_5$, negated_conjecture)
$b_3 \neq b_6$ cnf($\mathrm{at\_least\_11\_3}_6$, negated_conjecture)
$b_3 \neq b_7$ cnf($\mathrm{at\_least\_11\_3}_7$, negated_conjecture)
$b_3 \neq b_8$ cnf($\mathrm{at\_least\_11\_3}_8$, negated_conjecture)
$b_3 \neq b_9$ cnf($\mathrm{at\_least\_11\_3}_9$, negated_conjecture)
$b_3 \neq b_{10}$ cnf($\mathrm{at\_least\_11\_3}_{10}$, negated_conjecture)
$b_3 \neq b_{11}$ cnf($\mathrm{at\_least\_11\_3}_{11}$, negated_conjecture)
$b_4 \neq b_5$ cnf($\mathrm{at\_least\_11\_4}_5$, negated_conjecture)
$b_4 \neq b_6$ cnf($\mathrm{at\_least\_11\_4}_6$, negated_conjecture)
$b_4 \neq b_7$ cnf($\mathrm{at\_least\_11\_4}_7$, negated_conjecture)
$b_4 \neq b_8$ cnf($\mathrm{at\_least\_11\_4}_8$, negated_conjecture)
$b_4 \neq b_9$ cnf($\mathrm{at\_least\_11\_4}_9$, negated_conjecture)
$b_4 \neq b_{10}$ cnf($\mathrm{at\_least\_11\_4}_{10}$, negated_conjecture)
$b_4 \neq b_{11}$ cnf($\mathrm{at\_least\_11\_4}_{11}$, negated_conjecture)
$b_5 \neq b_6$ cnf($\mathrm{at\_least\_11\_5}_6$, negated_conjecture)
$b_5 \neq b_7$ cnf($\mathrm{at\_least\_11\_5}_7$, negated_conjecture)
$b_5 \neq b_8$ cnf($\mathrm{at\_least\_11\_5}_8$, negated_conjecture)
$b_5 \neq b_9$ cnf($\mathrm{at\_least\_11\_5}_9$, negated_conjecture)
$b_5 \neq b_{10}$ cnf($\mathrm{at\_least\_11\_5}_{10}$, negated_conjecture)
$b_5 \neq b_{11}$ cnf($\mathrm{at\_least\_11\_5}_{11}$, negated_conjecture)
$b_6 \neq b_7$ cnf($\mathrm{at\_least\_11\_6}_7$, negated_conjecture)

$b_6 \neq b_8$ cnf(at_least_11_6$_8$, negated_conjecture)
$b_6 \neq b_9$ cnf(at_least_11_6$_9$, negated_conjecture)
$b_6 \neq b_{10}$ cnf(at_least_11_6$_{10}$, negated_conjecture)
$b_6 \neq b_{11}$ cnf(at_least_11_6$_{11}$, negated_conjecture)
$b_7 \neq b_8$ cnf(at_least_11_7$_8$, negated_conjecture)
$b_7 \neq b_9$ cnf(at_least_11_7$_9$, negated_conjecture)
$b_7 \neq b_{10}$ cnf(at_least_11_7$_{10}$, negated_conjecture)
$b_7 \neq b_{11}$ cnf(at_least_11_7$_{11}$, negated_conjecture)
$b_8 \neq b_9$ cnf(at_least_11_8$_9$, negated_conjecture)
$b_8 \neq b_{10}$ cnf(at_least_11_8$_{10}$, negated_conjecture)
$b_8 \neq b_{11}$ cnf(at_least_11_8$_{11}$, negated_conjecture)
$b_9 \neq b_{10}$ cnf(at_least_11_9$_{10}$, negated_conjecture)
$b_9 \neq b_{11}$ cnf(at_least_11_9$_{11}$, negated_conjecture)
$b_{10} \neq b_{11}$ cnf(at_least_11_10$_{11}$, negated_conjecture)

SYN915+1.p TRUE
$true fof(truth, conjecture)

SYN915-1.p FALSE
$false cnf(false_clause, negated_conjecture)

SYN915∧4.p TRUE
include('Axioms/LCL010^0.ax')
ivalid@(iatom@itrue) thf(truth, conjecture)

SYN916+1.p FALSE
$false fof(falsity, conjecture)

SYN916-1.p FALSE
$true cnf(true_clause, negated_conjecture)

SYN916∧4.p FALSE
include('Axioms/LCL010^0.ax')
ivalid@(iatom@ifalse) thf(falsity, conjecture)

SYN917+1.p Combined problems from Smullyan
$((\forall x\colon (((f(x) \text{ and } g(x)) \Rightarrow h(x)) \Rightarrow \exists y\colon (f(y) \text{ and } \neg\, g(y))) \text{ and } (\forall w\colon (f(w) \Rightarrow g(w)) \text{ or } \forall z\colon (f(z) \Rightarrow h(z)))) \Rightarrow (\forall r\colon ((f(r) \text{ and } h(r)) \Rightarrow g(r)) \Rightarrow \exists v\colon (f(v) \text{ and } g(v) \text{ and } \neg\, h(v)))) \text{ and } ((\forall x, y\colon (r(x,y) \Rightarrow r(y,x)) \text{ and } \forall x, y, z\colon ((r(x,y) \text{ and } r(y,z)) \Rightarrow r(x,z))) \Rightarrow \forall x, y\colon (r(x,y) \Rightarrow r(x,x))) \text{ and } (((\forall x\colon ((f(x) \text{ and } g(x)) \Rightarrow h(x)) \Rightarrow \exists x\colon (f(x) \text{ and } \neg\, g(x))) \text{ and } (\forall w\colon (f(w) \Rightarrow g(w)) \text{ or } \forall z\colon (f(z) \Rightarrow h(z)))) \Rightarrow (\forall r\colon ((f(r) \text{ and } h(r)) \Rightarrow g(r)) \Rightarrow \exists v\colon (f(v) \text{ and } g(v) \text{ and } \neg\, h(v)))) \text{ and } \exists x\colon \forall y\colon ((p(y) \Rightarrow q(x)) \Rightarrow (p(x) \Rightarrow q(x))) \text{ and } (\forall x\colon (p(x) \text{ and } q(x)) \iff (\forall x\colon p(x) \text{ and } \forall x\colon q(x))) \text{ and } ((\forall x\colon p(x) \text{ or } \forall x\colon q(x)) \Rightarrow \forall x\colon (p(x) \text{ or } q(x))) \text{ and } (\exists x\colon (p(x) \text{ or } q(x)) \iff (\exists x\colon p(x) \text{ or } \exists x\colon q(x$
$\forall x\colon p(x)) \text{ and } (\exists x\colon (p(x) \text{ and } q(x)) \Rightarrow (\exists x\colon p(x) \text{ and } \exists x\colon q(x))) \text{ and } \forall y\colon (\forall x\colon p(x) \Rightarrow p(y)) \text{ and } (\forall x\colon p(x) \Rightarrow \exists x\colon p(x)) \text{ and } (\neg\, \exists y\colon p(y) \Rightarrow \forall y\colon (\exists x\colon p(x) \Rightarrow p(y))) \text{ and } (\forall x\colon (p(x) \text{ or } c) \iff (\forall x\colon p(x) \text{ or } c)) \text{ and } (\exists x\colon (p(x) \text{ and } c) \iff (\exists x\colon p(x) \text{ and } c)) \text{ and } (\exists x\colon c \iff c) \text{ and } (\forall x\colon c \iff c) \text{ and } (\exists x\colon (c \Rightarrow p(x)) \iff (c \Rightarrow \exists x\colon p(x))) \text{ and } (\exists x\colon (p(x) \Rightarrow c) \iff (\forall x\colon p(x) \Rightarrow c)) \text{ and } (\forall x\colon (c \Rightarrow p(x)) \iff (c \Rightarrow \forall x\colon p(x))) \text{ and } (\forall x\colon (p(x) \Rightarrow c) \iff (\exists x\colon p(x) \Rightarrow c))$ fof(prove_this, conjecture)

SYN918+1.p From Smullyan
$(\forall x\colon (((f(x) \text{ and } g(x)) \Rightarrow h(x)) \Rightarrow \exists y\colon (f(y) \text{ and } \neg\, g(y))) \text{ and } (\forall w\colon (f(w) \Rightarrow g(w)) \text{ or } \forall z\colon (f(z) \Rightarrow h(z)))) \Rightarrow (\forall r\colon ((f(r) \text{ and } h(r)) \Rightarrow g(r)) \Rightarrow \exists v\colon (f(v) \text{ and } g(v) \text{ and } \neg\, h(v)))$ fof(prove_this, conjecture)

SYN919+1.p From Smullyan
$(\forall x, y\colon (r(x,y) \Rightarrow r(y,x)) \text{ and } \forall x, y, z\colon ((r(x,y) \text{ and } r(y,z)) \Rightarrow r(x,z))) \Rightarrow \forall x, y\colon (r(x,y) \Rightarrow r(x,x))$ fof(prove_this, co

SYN920+1.p From Smullyan
$((\forall x\colon ((f(x) \text{ and } g(x)) \Rightarrow h(x)) \Rightarrow \exists x\colon (f(x) \text{ and } \neg\, g(x))) \text{ and } (\forall w\colon (f(w) \Rightarrow g(w)) \text{ or } \forall z\colon (f(z) \Rightarrow h(z)))) \Rightarrow (\forall r\colon ((f(r) \text{ and } h(r)) \Rightarrow g(r)) \Rightarrow \exists v\colon (f(v) \text{ and } g(v) \text{ and } \neg\, h(v)))$ fof(prove_this, conjecture)

SYN921+1.p From Smullyan
$\exists x\colon \forall y\colon ((p(y) \Rightarrow q(x)) \Rightarrow (p(x) \Rightarrow q(x)))$ fof(prove_this, conjecture)

SYN922+1.p From Smullyan
$\forall x\colon (p(x) \text{ and } q(x)) \iff (\forall x\colon p(x) \text{ and } \forall x\colon q(x))$ fof(prove_this, conjecture)

SYN923+1.p From Smullyan
$(\forall x\colon p(x) \text{ or } \forall x\colon q(x)) \Rightarrow \forall x\colon (p(x) \text{ or } q(x))$ fof(prove_this, conjecture)

SYN924+1.p From Smullyan
$\exists x\colon (p(x) \text{ or } q(x)) \iff (\exists x\colon p(x) \text{ or } \exists x\colon q(x))$ fof(prove_this, conjecture)

SYN925+1.p From Smullyan
$\exists y\colon (p(y) \Rightarrow \forall x\colon p(x))$ fof(prove_this, conjecture)

SYN926+1.p From Smullyan
$\exists x\colon (p(x) \text{ and } q(x)) \Rightarrow (\exists x\colon p(x) \text{ and } \exists x\colon q(x))$ fof(prove_this, conjecture)

SYN927+1.p From Smullyan
$\forall y\colon (\forall x\colon p(x) \Rightarrow p(y))$ fof(prove_this, conjecture)

SYN928+1.p From Smullyan
$\forall x\colon p(x) \Rightarrow \exists x\colon p(x)$ fof(prove_this, conjecture)

SYN929+1.p From Smullyan
$\neg\, \exists y\colon p(y) \Rightarrow \forall y\colon (\exists x\colon p(x) \Rightarrow p(y))$ fof(prove_this, conjecture)

SYN930+1.p From Smullyan
$\forall x\colon (p(x) \text{ or } c) \iff (\forall x\colon p(x) \text{ or } c)$ fof(prove_this, conjecture)

SYN931+1.p From Smullyan
$\exists x\colon (p(x) \text{ and } c) \iff (\exists x\colon p(x) \text{ and } c)$ fof(prove_this, conjecture)

SYN932+1.p From Smullyan
$\exists x\colon c \iff c$ fof(prove_this, conjecture)

SYN933+1.p From Smullyan
$\forall x\colon c \iff c$ fof(prove_this, conjecture)

SYN934+1.p From Smullyan
$\exists x\colon (c \Rightarrow p(x)) \iff (c \Rightarrow \exists x\colon p(x))$ fof(prove_this, conjecture)

SYN935+1.p From Smullyan
$\exists x\colon (p(x) \Rightarrow c) \iff (\forall x\colon p(x) \Rightarrow c)$ fof(prove_this, conjecture)

SYN936+1.p From Smullyan
$\forall x\colon (c \Rightarrow p(x)) \iff (c \Rightarrow \forall x\colon p(x))$ fof(prove_this, conjecture)

SYN937+1.p From Smullyan
$\forall x\colon (p(x) \Rightarrow c) \iff (\exists x\colon p(x) \Rightarrow c)$ fof(prove_this, conjecture)

SYN939+1.p Syntactic from Shults
$\forall c, b\colon (\forall z\colon q(f(z)) \Rightarrow \exists x, y\colon ((p(f(y)) \Rightarrow p(x)) \text{ and } (r(y) \Rightarrow (r(b) \text{ and } r(c))) \text{ and } q(x)))$ fof(prove_this, conjecture)

SYN940+1.p Syntactic from Shults
$\forall b, c\colon (\forall z\colon q(f(z)) \Rightarrow \exists x, y\colon ((p(f(y)) \Rightarrow (p(x) \text{ and } (r(y) \Rightarrow (r(b) \text{ and } r(c))))) \text{ and } q(x)))$ fof(prove_this, conjecture)

SYN941+1.p Syntactic from Shults
$\forall b, c\colon (q(f(b)) \Rightarrow \exists x, y\colon ((p(f(y)) \Rightarrow (p(x) \text{ and } (r(y) \Rightarrow (r(b) \text{ and } r(c))))) \text{ and } q(x)))$ fof(prove_this, conjecture)

SYN942+1.p Syntactic from Shults
$(\forall x\colon (a(x) \Rightarrow (b(x) \text{ or } c(x))) \text{ and } \neg\, \forall x\colon (a(x) \Rightarrow b(x))) \Rightarrow \exists x\colon (a(x) \text{ and } c(x))$ fof(prove_this, conjecture)

SYN943+1.p Syntactic from Shults
$\forall a\colon \exists x, x_2, x_3, x_4, y\colon ((p(a) \text{ and } e(a) \text{ and } (e(x) \Rightarrow (g(x) \text{ or } s(x, f(x)))) \text{ and } (e(x_2) \Rightarrow (g(x_2) \text{ or } c(f(x_2)))) \text{ and } (s(a, y) \Rightarrow p(y))) \Rightarrow ((p(x_3) \text{ and } g(x_3)) \text{ or } (p(x_4) \text{ and } c(x_4))))$ fof(prove_this, conjecture)

SYN944+1.p Syntactic from Shults
$\forall a, b, c\colon ((s(a) \text{ and } s(b) \text{ and } r(b, c) \text{ and } \forall x\colon (s(x) \Rightarrow p(x)) \text{ and } \forall x, y\colon (r(x, y) \Rightarrow q(x, y))) \Rightarrow \exists x, y\colon (p(x) \text{ and } q(x, y)))$ fo

SYN945+1.p Syntactic from Shults
$\forall x\colon p(x) \Rightarrow \forall a, b\colon (p(a) \text{ and } p(b))$ fof(prove_this, conjecture)

SYN946+1.p Syntactic from Shults
$(\forall x\colon p(x) \text{ and } \exists y\colon q(y)) \Rightarrow \exists z\colon \forall y\colon (p(y) \text{ or } r(z))$ fof(prove_this, conjecture)

SYN947+1.p Syntactic from Shults
$\forall x\colon \exists y\colon (p(x) \text{ and } q(y)) \Rightarrow \exists z\colon \forall y\colon (p(y) \text{ or } r(z))$ fof(prove_this, conjecture)

SYN948+1.p Syntactic from Shults
$\forall x\colon \exists y\colon (a(x, y) \text{ and } a(y, y)) \Rightarrow \exists z\colon a(z, z)$ fof(prove_this, conjecture)

SYN949+1.p Syntactic from Shults

$\forall a, b, c$: ((s(a) and s(b) and r(b, c) and $\forall x$: (s(x) $\Rightarrow$ p(x)) and $\forall x, y$: (r(x, y) $\Rightarrow$ q(x, y))) $\Rightarrow$ $\exists x, y$: (p(x) and q(x, y))) fo

SYN950+1.p Syntactic from Shults
$\forall a, b$: ($\forall y$: (q(y) $\Rightarrow$ p(y)) $\Rightarrow$ $\exists x$: ((p(x) $\Rightarrow$ p(a)) and (q(x) $\Rightarrow$ p(b)))) fof(prove_this, conjecture)

SYN951+1.p Syntactic from Shults
$\exists x$: p(x) $\Rightarrow$ ($\exists x$: p(x) and (a $\Rightarrow$ ((b or $\neg$ b) and (q $\Rightarrow$ q)))) fof(prove_this, conjecture)

SYN952+1.p Syntactic from Shults
$\forall x$: p(x) $\Rightarrow$ $\exists y$: p(y) fof(prove_this, conjecture)

SYN953+1.p Syntactic from Shults
$\forall x$: (p(x) $\Rightarrow$ q(x)) $\Rightarrow$ ($\forall x$: p(x) $\Rightarrow$ $\forall x$: q(x)) fof(prove_this, conjecture)

SYN954+1.p Syntactic from Shults
$\forall a, b$: ($\forall z$: (q(z) $\Rightarrow$ p(z)) $\Rightarrow$ $\exists x$: ((p(x) $\Rightarrow$ p(a)) and (q(x) $\Rightarrow$ p(b)))) fof(prove_this, conjecture)

SYN955+1.p Syntactic from Shults
$\forall x$: (a(x) $\Rightarrow$ b(x)) $\Rightarrow$ ($\exists x$: a(x) $\Rightarrow$ $\exists x$: b(x)) fof(prove_this, conjecture)

SYN956+1.p Syntactic from Shults
$\exists x$: (a(x) $\Rightarrow$ b(x)) $\Rightarrow$ ($\forall x$: a(x) $\Rightarrow$ $\exists x$: b(x)) fof(prove_this, conjecture)

SYN957+1.p Syntactic from Shults
$\neg \exists y$: $\forall x$: (a(x, y) $\iff$ $\neg$ a(x, x)) fof(prove_this, conjecture)

SYN958+1.p Syntactic from Shults
($\exists x$: a(x) and $\forall x$: b(x)) $\Rightarrow$ $\exists x$: (a(x) and b(x)) fof(prove_this, conjecture)

SYN959+1.p Syntactic from Shults
$\exists x$: b(x) $\Rightarrow$ $\exists x$: (a(x) or b(x)) fof(prove_this, conjecture)

SYN960+1.p Syntactic from Shults
$\exists x, y$: a(x, y) $\iff$ $\exists y, x$: a(x, y) fof(prove_this, conjecture)

SYN961+1.p Syntactic from Shults
$\forall a, b$: ($\forall x$: p(x) $\Rightarrow$ (p(a) and p(b))) fof(prove_this, conjecture)

SYN962+1.p Syntactic from Shults
$\forall x$: p(x) $\Rightarrow$ ($\forall x$: p(x) and $\forall y$: p(y)) fof(prove_this, conjecture)

SYN963+1.p Syntactic from Shults
$\exists x$: p(x) $\iff$ $\exists y$: p(y) fof(prove_this, conjecture)

SYN964+1.p Syntactic from Shults
$\exists x$: p(x) $\Rightarrow$ $\exists z$: p(z) fof(prove_this, conjecture)

SYN965+1.p Syntactic from Shults
$\exists z$: $\forall x$: $\exists y$: ((p(y, x) $\Rightarrow$ $\exists w$: p(w, y)) and ((p(z, y) and p(y, z)) $\Rightarrow$ p(y, x))) fof(prove_this, conjecture)

SYN966+1.p Syntactic from Shults
$\forall x, y$: (eq(x, y) $\iff$ $\forall z$: (a_member_of(z, x) $\iff$ a_member_of(z, y))) $\Rightarrow$ $\forall a, b$: (eq(a, b) $\Rightarrow$ eq(b, a)) fof(prove_this, conj

SYN967+1.p Syntactic from Shults
$\forall a, b$: ($\forall y$: (q(y) $\Rightarrow$ p(y)) $\Rightarrow$ $\exists x$: ((p(x) $\Rightarrow$ p(a)) and (q(x) $\Rightarrow$ p(b)))) fof(prove_this, conjecture)

SYN968+1.p Syntactic from Shults
$\exists x$: $\forall y$: (p(x) $\Rightarrow$ p(y)) fof(prove_this, conjecture)

SYN969+1.p Syntactic from Shults
$\forall b$: (($\forall x$: (p(x) $\Rightarrow$ q(x)) and r(b)) $\Rightarrow$ ($\forall y$: (r(y) $\Rightarrow$ p(y)) $\Rightarrow$ q(b))) fof(prove_this, conjecture)

SYN970+1.p Syntactic from Shults
$\forall a, b$: $\exists x, y$: ((p(x) $\Rightarrow$ r(y)) $\Rightarrow$ (p(a) $\Rightarrow$ r(b))) fof(prove_this, conjecture)

SYN971+1.p Syntactic from Shults
$\exists y$: ($\exists x$: p(x) $\Rightarrow$ p(y)) fof(prove_this, conjecture)

SYN972+1.p Syntactic from Shults
$\exists x$: $\forall y$: p(x, y) $\Rightarrow$ $\forall y$: $\exists x$: p(x, y) fof(prove_this, conjecture)

SYN973+1.p Syntactic from Shults
p(z) $\Rightarrow$ p(z) fof(prove_this, conjecture)

SYN974+1.p Syntactic from Shults

$\exists x\colon p(x) \Rightarrow \exists y\colon p(y)$ fof(prove_this, conjecture)

SYN975+1.p Syntactic from Shults
$\forall x, y\colon p(x, y) \Rightarrow \forall x\colon p(x, x)$ fof(prove_this, conjecture)

SYN976+1.p Syntactic from Shults
$\forall a\colon (((f \text{ or } g) \text{ and } \forall x\colon (p(x) \text{ and } q(x))) \Rightarrow q(a))$ fof(prove_this, conjecture)

SYN977+1.p Syntactic from Shults
$(a \iff b) \text{ or } a \text{ or } b$ fof(prove_this, conjecture)

SYN977∧4.p Syntactic from Shults
include('Axioms/LCL010^0.ax')
a: \$i → \$o thf(a_type, type)
b: \$i → \$o thf(b_type, type)
ivalid@(ior@(iequiv@(iatom@a)@(iatom@b))@(ior@(iatom@a)@(iatom@b))) thf(prove_this, conjecture)

SYN978+1.p Syntactic from Shults
$(a \text{ and } b) \Rightarrow (a \iff b)$ fof(prove_this, conjecture)

SYN978∧4.p Syntactic from Shults
include('Axioms/LCL010^0.ax')
a: \$i → \$o thf(a_type, type)
b: \$i → \$o thf(b_type, type)
ivalid@(iimplies@(iand@(iatom@a)@(iatom@b))@(iequiv@(iatom@a)@(iatom@b))) thf(prove_this, conjecture)

SYN979+1.p Syntactic from Shults
$\forall a, b\colon \exists x, y\colon (((q(x) \Rightarrow p(x, a)) \text{ and } q(a) \text{ and } q(b) \text{ and } (r(y) \Rightarrow p(b, y)) \text{ and } r(a) \text{ and } r(b) \text{ and } (s(a) \Rightarrow p(x, y)) \text{ and } s(a)) \Rightarrow p(a, b))$ fof(prove_this, conjecture)

SYN980+1.p Syntactic from Shults
$\forall b\colon (\forall y\colon ((r(b) \Rightarrow r(y)) \Rightarrow p(f(y), y)) \Rightarrow \exists x, y\colon (p(x, y) \text{ and } (q(f(b), b) \Rightarrow q(x, y))))$ fof(prove_this, conjecture)

SYN981+1.p Syntactic from Shults
$(\forall x\colon (p(x) \Rightarrow q(x)) \text{ and } \exists y\colon (q(y) \Rightarrow r(y))) \Rightarrow \exists z\colon (p(z) \Rightarrow r(z))$ fof(prove_this, conjecture)

SYN982-1.p Problem that's Horn but resists hyper-resolution
ssNonce(na) cnf(clause_1, axiom)
ssP(t) cnf(clause_2, axiom)
ssBf(na) cnf(clause_3, axiom)
ssP(b) cnf(clause_4, axiom)
ssP(a) cnf(clause_5, axiom)
ssNonce(nb(u)) cnf(clause_6, axiom)
ssNonce(tb(u)) cnf(clause_7, axiom)
$\neg$ ssNonce(kt(u)) cnf(clause_8, axiom)
ssTk(key(bt, b)) cnf(clause_9, axiom)
ssTk(key(at, a)) cnf(clause_{10}, axiom)
ssBk(key(bt, t)) cnf(clause_{11}, axiom)
ssSa(pair(b, na)) cnf(clause_{12}, axiom)
ssAk(key(at, t)) cnf(clause_{13}, axiom)
ssIm(pair(u, v)) ⇒ ssIm(v) cnf(clause_{14}, axiom)
ssIm(pair(u, v)) ⇒ ssIm(u) cnf(clause_{15}, axiom)
ssM(sent(a, b, pair(a, na))) cnf(clause_{16}, axiom)
ssIm(triple(u, v, w)) ⇒ ssIm(w) cnf(clause_{17}, axiom)
ssIm(triple(u, v, w)) ⇒ ssIm(v) cnf(clause_{18}, axiom)
ssIm(triple(u, v, w)) ⇒ ssIm(u) cnf(clause_{19}, axiom)
ssM(sent(u, v, w)) ⇒ ssIm(w) cnf(clause_{20}, axiom)
ssIm(quadr(u, v, w, x)) ⇒ ssIm(x) cnf(clause_{21}, axiom)
ssIm(quadr(u, v, w, x)) ⇒ ssIm(w) cnf(clause_{22}, axiom)
ssIm(quadr(u, v, w, x)) ⇒ ssIm(v) cnf(clause_{23}, axiom)
ssIm(quadr(u, v, w, x)) ⇒ ssIm(u) cnf(clause_{24}, axiom)
(ssIm(u) and ssP(v)) ⇒ ssIk(key(u, v)) cnf(clause_{25}, axiom)
(ssIm(u) and ssIm(v)) ⇒ ssIm(pair(u, v)) cnf(clause_{26}, axiom)
(ssIm(u) and ssP(v) and ssP(w)) ⇒ ssM(sent(v, w, u)) cnf(clause_{27}, axiom)
(ssIm(u) and ssIm(v) and ssIm(w)) ⇒ ssIm(triple(u, v, w)) cnf(clause_{28}, axiom)

(ssIm(u) and ssIk(key(v, w)) and ssP(w)) $\Rightarrow$ ssIm(encr(u, v)) cnf(clause$_{29}$, axiom)
(ssM(sent(u, b, pair(u, v))) and ssBf(v)) $\Rightarrow$ ssSb(pair(u, v)) cnf(clause$_{30}$, axiom)
(ssIm(u) and ssIm(v) and ssIm(w) and ssIm(x)) $\Rightarrow$ ssIm(quadr(u, v, w, x)) cnf(clause$_{31}$, axiom)
(ssM(sent(t, a, triple(encr(quadr(u, v, w, x), at), y, z))) and ssSa(pair(u, v))) $\Rightarrow$ ssAk(key(w, u)) cnf(clause$_{32}$, axiom)
(ssM(sent(u, b, pair(u, v))) and ssBf(v)) $\Rightarrow$ ssM(sent(b, t, triple(b, nb(v), encr(triple(u, v, tb(v)), bt)))) cnf(clause$_{33}$, axiom
(ssM(sent(u, b, pair(encr(triple(u, v, tb(w)), bt), encr(nb(w), v)))) and ssSb(pair(u, w))) $\Rightarrow$ ssBk(key(v, u)) cnf(clause$_{34}$, a
(ssM(sent(t, a, triple(encr(quadr(u, v, w, x), at), y, z))) and ssSa(pair(u, v))) $\Rightarrow$ ssM(sent(a, u, pair(y, encr(z, w)))) cnf(cla
(ssM(sent(u, t, triple(u, v, encr(triple(w, x, y), z)))) and ssTk(key(z, u)) and ssTk(key(x_1, w)) and ssNonce(x)) $\Rightarrow$ ssM(sent(t
ssIk(key(u, b)) $\Rightarrow$ $\neg$ ssBk(key(u, a)) cnf(clause$_{37}$, negated_conjecture)

SYN983$\wedge$1.p Factoring application over conjunction
a: \$o thf(a_const, type)
b: \$o thf(b_const, type)
p: \$o $\rightarrow$ \$o thf(p_const, type)
(p@a and p@b) $\Rightarrow$ (p@(a and b)) thf(thm, conjecture)

SYN984$\wedge$1.p Factoring application over conjunction with lambda
Variation of BB-1 with functional extensionality
a: \$o thf(a_const, type)
b: \$o thf(b_const, type)
p: (\$i $\rightarrow$ \$o) $\rightarrow$ \$o thf(p_const, type)
(p@λx: \$i. a and p@λx: \$i. b) $\Rightarrow$ (p@λx: \$i. (a and b)) thf(thm, conjecture)

SYN985$\wedge$1.p Factoring application over conjunction with abstraction
Variation of BB-1 with functional extensionality
$\neg \forall p$: (\$i $\rightarrow$ \$o) $\rightarrow$ \$o, a: \$i $\rightarrow$ \$o, b: \$i $\rightarrow$ \$o: ((p@λx: \$i: (a@x) and p@λx: \$i: (b@x)) $\Rightarrow$ (p@λx: \$i: (a@x and b@x))) thf(

SYN986+1.000.p Orevkov formula - size 0
hyp(2,k,1) is defined. Each Ck has a non-normal natural deduction of size linear in k, and each normal deduction of Ck has at least hyp(2,k,1)=2_k nodes.
include('Axioms/SYN002+0.ax')
$\exists z_0$: $r(0, 0, z_0)$ fof(ck, conjecture)

SYN986+1.001.p Orevkov formula - size 1
hyp(2,k,1) is defined. Each Ck has a non-normal natural deduction of size linear in k, and each normal deduction of Ck has at least hyp(2,k,1)=2_k nodes.
include('Axioms/SYN002+0.ax')
$\exists z_1, z_0$: ($r(0, 0, z_1)$ and $r(0, z_1, z_0)$) fof(ck, conjecture)

SYN986+1.002.p Orevkov formula - size 2
hyp(2,k,1) is defined. Each Ck has a non-normal natural deduction of size linear in k, and each normal deduction of Ck has at least hyp(2,k,1)=2_k nodes.
include('Axioms/SYN002+0.ax')
$\exists z_2, z_1, z_0$: ($r(0, 0, z_2)$ and $r(0, z_2, z_1)$ and $r(0, z_1, z_0)$) fof(ck, conjecture)

SYN986+1.003.p Orevkov formula - size 3
hyp(2,k,1) is defined. Each Ck has a non-normal natural deduction of size linear in k, and each normal deduction of Ck has at least hyp(2,k,1)=2_k nodes.
include('Axioms/SYN002+0.ax')
$\exists z_3, z_2, z_1, z_0$: ($r(0, 0, z_3)$ and $r(0, z_3, z_2)$ and $r(0, z_2, z_1)$ and $r(0, z_1, z_0)$) fof(ck, conjecture)

SYN986+1.004.p Orevkov formula - size 4
hyp(2,k,1) is defined. Each Ck has a non-normal natural deduction of size linear in k, and each normal deduction of Ck has at least hyp(2,k,1)=2_k nodes.
include('Axioms/SYN002+0.ax')
$\exists z_4, z_3, z_2, z_1, z_0$: ($r(0, 0, z_4)$ and $r(0, z_4, z_3)$ and $r(0, z_3, z_2)$ and $r(0, z_2, z_1)$ and $r(0, z_1, z_0)$) fof(ck, conjecture)

SYN986+1.005.p Orevkov formula - size 5
hyp(2,k,1) is defined. Each Ck has a non-normal natural deduction of size linear in k, and each normal deduction of Ck has at least hyp(2,k,1)=2_k nodes.
include('Axioms/SYN002+0.ax')
$\exists z_5, z_4, z_3, z_2, z_1, z_0$: ($r(0, 0, z_5)$ and $r(0, z_5, z_4)$ and $r(0, z_4, z_3)$ and $r(0, z_3, z_2)$ and $r(0, z_2, z_1)$ and $r(0, z_1, z_0)$) fof(ck, conje

SYN986+1.006.p Orevkov formula - size 6

hyp(2,k,1) is defined. Each Ck has a non-normal natural deduction of size linear in k, and each normal deduction of Ck has at least hyp(2,k,1)=2_k nodes.
include('Axioms/SYN002+0.ax')
$\exists z_6, z_5, z_4, z_3, z_2, z_1, z_0$: $(r(0,0,z_6)$ and $r(0,z_6,z_5)$ and $r(0,z_5,z_4)$ and $r(0,z_4,z_3)$ and $r(0,z_3,z_2)$ and $r(0,z_2,z_1)$ and $r(0,z_1,z$

SYN987∧1.p All things are true
$\forall x$: $o: x thf(thm, conjecture)

SYN987∧2.p All things are true
$\forall x$: $o: x thf(thm, axiom)

SYN988∧1.p All things are false
$\forall x$: $o: $\neg\, x$ thf(thm, conjecture)

SYN988∧2.p All things are false
$\forall x$: $o: $\neg\, x$ thf(thm, axiom)

SYN989∧1.p All things are true or false
$\forall x$: $o: $(x$ or $\neg\, x)$ thf(thm, conjecture)

SYN989∧2.p All things are true or false
$\forall x$: $o: $(x$ or $\neg\, x)$ thf(thm, axiom)

SYN989∧3.p All things are true or false
p: $o thf($p$, type)
p or $\neg\, p$ thf(cTRIV_0, conjecture)

SYN990∧1.p Simple test for satisfiability
There are two individuals, a and b. Everything is either a or b. There are three functions from individuals to individuals: f,g,h. They are all different.
a: $i thf($a$, type)
b: $i thf($b$, type)
f: $i → $i thf($f$, type)
g: $i → $i thf($g$, type)
h: $i → $i thf($h$, type)
$\forall x$: $i: $(x = a$ or $x = b)$ thf(ab, axiom)
$f \neq g$ thf(fg, axiom)
$g \neq h$ thf(gh, axiom)
$f \neq h$ thf(fh, axiom)

SYN991∧1.p Inconsistency of axioms that says all relations are reflexive
refl: ($i → $i → $o) → $o thf(refl_type, type)
refl = $(\lambda r$: $i → $i → $o: $\forall x$: $i: $(r@x@x))$ thf(refl, definition)
$\forall r$: $i → $i → $o: (refl@$r$) thf(ax, axiom)

SYN992∧1.p There exists a reflexive relation
refl: ($i → $i → $o) → $o thf(refl_type, type)
refl = $(\lambda r$: $i → $i → $o: $\forall x$: $i: $(r@x@x))$ thf(refl, definition)
$\exists r$: $i → $i → $o: (refl@$r$) thf(ax, conjecture)

SYN993∧1.p Skolemization test 1
q: $i → $i → $o thf(q_decl, type)
$\exists x$: $i: $\forall y$: $i: $(q@x@y)$ or $\exists u$: $i: $\forall v$: $i: $\neg\, q@v@u$ thf(conj, conjecture)

SYN994∧1.p Skolemization test 2
q: $i → $i → $o thf(q_decl, type)
$\exists y$: $i: $\forall x$: $i: $(\forall z$: $i: $(q@x@z)$ or $\neg\, q@x@y)$ thf(conj, conjecture)

SYN995∧1.p Every function has a fixed point
leibeq: $i → $i → $o thf(leibeq_decl, type)
leibeq = $(\lambda x$: $i, y: $i: $\forall p$: $i → $o: $((p@x) \iff (p@y)))$ thf(leibeq, definition)
$\forall f$: $i → $i: $\exists x$: $i: (leibeq@$(f@x)@x)$ thf(conj, conjecture)

SYN996∧1.p Test for naive Skolemization
r: $i → $i → $o thf(r_decl, type)
$\forall x$: $i: $\exists y$: $i: $(r@x@y) \Rightarrow \exists f$: $i → $i: $\forall x$: $i: $(r@x@(f@x))$ thf(conj, conjecture)

SYN997∧1.p Test for validity of axiom of choice
$\exists e$: ($i → $o) → $i: $\forall p$: $i → $o: $(\exists y$: $i: $(p@y) \Rightarrow (p@(e@p)))$ thf(conj, conjecture)

SYN998∧1.p Leibniz equality is reflexive
leibeq: $i → $i → $o thf(leibeq_decl, type)
leibeq = (λ$x: $i, $y: $i: ∀$p: $i → $o: (($p@$x) ⇒ ($p@$y))) thf(leibeq, definition)
∀$x: $i: (leibeq@$x@$x) thf(conj, conjecture)

SYN999∧1.p Leibniz equality is symmetric
leibeq: $i → $i → $o thf(leibeq_decl, type)
leibeq = (λ$x: $i, $y: $i: ∀$p: $i → $o: (($p@$x) ⇒ ($p@$y))) thf(leibeq, definition)
∀$x: $i, $y: $i: ((leibeq@$x@$y) ⇒ (leibeq@$y@$x)) thf(conj, conjecture)