COL axioms

COL001-0.ax Type-respecting combinators
$\text{apply}(k(x), y) = x$ cnf(k_definition, axiom)
$\text{apply}(\text{projection}_1, \text{pair}(x, y)) = x$ cnf(projection$_1$, axiom)
$\text{apply}(\text{projection}_2, \text{pair}(x, y)) = y$ cnf(projection$_2$, axiom)
$\text{pair}(\text{apply}(\text{projection}_1, x), \text{apply}(\text{projection}_2, x)) = x$ cnf(pairing, axiom)
$\text{apply}(\text{pair}(x, y), z) = \text{pair}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(pairwise_application, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{abstraction}, x), y), z) = \text{apply}(\text{apply}(x, k(z)), \text{apply}(y, z))$ cnf(abstraction, axiom)
$\text{apply}(\text{eq}, \text{pair}(x, x)) = \text{projection}_1$ cnf(equality, axiom)
$x = y$ or $\text{apply}(\text{eq}, \text{pair}(x, y)) = \text{projection}_2$ cnf(extensionality$_1$, axiom)
$\text{apply}(x, n(x, y)) = \text{apply}(y, n(x, y)) \Rightarrow x = y$ cnf(extensionality$_2$, axiom)
$\text{projection}_1 \neq \text{projection}_2$ cnf(different_projections, axiom)

COL problems

COL001-1.p Weak fixed point for S and K
The weak fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz) and (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL001-2.p Weak fixed point for S and K
The weak fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz) and (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(i, x) = x$ cnf(i_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(s, \text{apply}(b, x)), i), \text{apply}(\text{apply}(s, \text{apply}(b, x)), i)) = \text{apply}(x, \text{apply}(\text{apply}(\text{apply}(s, \text{apply}(b, x)), i), \text{apply}(\text{ap}$
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL002-1.p Weak fixed point for S, B, C, and I
The weak fixed point property holds for the set P consisting of the combinators S, B, C, and I, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), ((Cx)y)z = (xz)y, and Ix = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(c, x), y), z) = \text{apply}(\text{apply}(x, z), y)$ cnf(c_definition, axiom)
$\text{apply}(i, x) = x$ cnf(i_definition, axiom)
$y \neq \text{apply}(\text{fixed\_pt}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL002-2.p Weak fixed point for S, B, C, and I
The weak fixed point property holds for the set P consisting of the combinators S, B, C, and I, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), ((Cx)y)z = (xz)y, and Ix = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(c, x), y), z) = \text{apply}(\text{apply}(x, z), y)$ cnf(c_definition, axiom)
$\text{apply}(i, x) = x$ cnf(i_definition, axiom)
$\text{weak\_sage} = \text{apply}(\text{fixed\_pt}, \text{weak\_sage}) \Rightarrow \text{fixed\_point}(\text{weak\_sage})$ cnf(weak_fixed_point, axiom)
$\neg\,\text{fixed\_point}(\text{apply}(\text{apply}(\text{apply}(s, \text{apply}(b, x)), i), \text{apply}(\text{apply}(s, \text{apply}(b, x)), i)))$ cnf(prove_weak_fixed_point, negated_co

COL002-3.p Weak fixed point for S, B, C, and I
The weak fixed point property holds for the set P consisting of the combinators S, B, C, and I, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), ((Cx)y)z = (xz)y, and Ix = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(c, x), y), z) = \text{apply}(\text{apply}(x, z), y)$ cnf(c_definition, axiom)
$\text{apply}(i, x) = x$ cnf(i_definition, axiom)
$\text{weak\_sage} = \text{apply}(\text{fixed\_pt}, \text{weak\_sage}) \Rightarrow \text{fixed\_point}(\text{weak\_sage})$ cnf(weak_fixed_point, axiom)
$\neg\,\text{fixed\_point}(\text{apply}(\text{apply}(\text{apply}(s, \text{apply}(c, \text{apply}(b, x))), \text{apply}(s, \text{apply}(c, \text{apply}(b, x)))), \text{apply}(s, \text{apply}(c, \text{apply}(b, x)))))$ c

COL002-4.p Weak fixed point for S, B, C, and I
The weak fixed point property holds for the set P consisting of the combinators S, B, C, and I, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), ((Cx)y)z = (xz)y, and Ix = x.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s,x),y),z) = \mathrm{apply}(\mathrm{apply}(x,z),\mathrm{apply}(y,z))$ cnf(s_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(c,x),y),z) = \mathrm{apply}(\mathrm{apply}(x,z),y)$ cnf(c_definition, axiom)
$\mathrm{apply}(i,x) = x$ cnf(i_definition, axiom)
$\mathrm{weak\_fixed\_point}(x) = \mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s,\mathrm{apply}(b,x)),i),\mathrm{apply}(\mathrm{apply}(s,\mathrm{apply}(b,x)),i))$ cnf(weak_fixed_point, axiom)
$\mathrm{weak\_fixed\_point}(\mathrm{fixed\_pt}) \neq \mathrm{apply}(\mathrm{fixed\_pt},\mathrm{weak\_fixed\_point}(\mathrm{fixed\_pt}))$ cnf(prove_weak_fixed_point, negated_conjecture)

COL002-5.p Weak fixed point for S, B, C, and I
The weak fixed point property holds for the set P consisting of the combinators S, B, C, and I, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), ((Cx)y)z = (xz)y, and Ix = x.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s,x),y),z) = \mathrm{apply}(\mathrm{apply}(x,z),\mathrm{apply}(y,z))$ cnf(s_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(c,x),y),z) = \mathrm{apply}(\mathrm{apply}(x,z),y)$ cnf(c_definition, axiom)
$\mathrm{apply}(i,x) = x$ cnf(i_definition, axiom)
$\mathrm{weak\_fixed\_point}(x) = \mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s,\mathrm{apply}(c,\mathrm{apply}(b,x))),\mathrm{apply}(s,\mathrm{apply}(c,\mathrm{apply}(b,x)))),\mathrm{apply}(s,\mathrm{apply}(c,\mathrm{apply}(b,x$
$\mathrm{weak\_fixed\_point}(\mathrm{fixed\_pt}) \neq \mathrm{apply}(\mathrm{fixed\_pt},\mathrm{weak\_fixed\_point}(\mathrm{fixed\_pt}))$ cnf(prove_weak_fixed_point, negated_conjecture)

COL003-1.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w,x),y) = \mathrm{apply}(\mathrm{apply}(x,y),y)$ cnf(w_definition, axiom)
$\mathrm{apply}(y,f(y)) \neq \mathrm{apply}(f(y),\mathrm{apply}(y,f(y)))$ cnf(prove_strong_fixed_point, negated_conjecture)

COL003-10.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w,x),y) = \mathrm{apply}(\mathrm{apply}(x,y),y)$ cnf(w_definition, axiom)
$\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}) = \mathrm{apply}(\mathrm{fixed\_pt},\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt})) \Rightarrow \mathrm{fixed\_point}(\mathrm{strong\_fixed\_point})$
$\neg\,\mathrm{fixed\_point}(\mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(w,w)),\mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(b,w)),\mathrm{apply}(\mathrm{apply}(b,b),b))))$ cnf(prove_strong_fixed_poin

COL003-12.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w,x),y) = \mathrm{apply}(\mathrm{apply}(x,y),y)$ cnf(w_definition, axiom)
$\mathrm{strong\_fixed\_point} = \mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(w,w)),\mathrm{apply}(\mathrm{apply}(b,w),\mathrm{apply}(\mathrm{apply}(b,b),b)))$ cnf(strong_fixed_point, axiom)
$\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}) \neq \mathrm{apply}(\mathrm{fixed\_pt},\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-13.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w,x),y) = \mathrm{apply}(\mathrm{apply}(x,y),y)$ cnf(w_definition, axiom)
$\mathrm{strong\_fixed\_point} = \mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(w,w)),\mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(\mathrm{apply}(b,w),b)),b))$ cnf(strong_fixed_point, axiom)
$\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}) \neq \mathrm{apply}(\mathrm{fixed\_pt},\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-14.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w,x),y) = \mathrm{apply}(\mathrm{apply}(x,y),y)$ cnf(w_definition, axiom)
$\mathrm{strong\_fixed\_point} = \mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(w,w)),\mathrm{apply}(\mathrm{apply}(b,w),b))),b)$ cnf(strong_fixed_point, axiom)
$\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}) \neq \mathrm{apply}(\mathrm{fixed\_pt},\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-15.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)

$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w, w)), w)), \text{apply}(\text{apply}(b, b), b))$ cnf(strong_fixed_point, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-16.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w, w)), w)), b)), b)$ cnf(strong_fixed_point, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-17.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w, w)), \text{apply}(b, w))), b)), b)$ cnf(strong_fixed_poin
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-18.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w, w)), \text{apply}(b, w))), \text{apply}(\text{apply}(b, b), b))$ cnf(strong_fixed_poin
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-19.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w, w)), \text{apply}(\text{apply}(b, \text{apply}(b, w)), b))), b)$ cnf(strong_fixed_poin
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-2.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(w, w)), \text{apply}(\text{apply}(b, w), \text{apply}(\text{apply}(b, b), b))))$ cnf(prove_strong_fixed_point, negated

COL003-20.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(w, w)), \text{apply}(\text{apply}(b, \text{apply}(b, w)), \text{apply}(\text{apply}(b, b), b)))$ cnf(strong_fixed_poin
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL003-3.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(w, w)), \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, w), b)), b)))$ cnf(prove_strong_fixed_point, negated

COL003-4.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)

$\text{apply}(\text{apply}(w,x),y) = \text{apply}(\text{apply}(x,y),y)$ cnf(w_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w,w)), \text{apply}(\text{apply}(b,w),b))),b))$ cnf(prove_strong_fixed_point, negated

COL003-5.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b,x),y),z) = \text{apply}(x, \text{apply}(y,z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w,x),y) = \text{apply}(\text{apply}(x,y),y)$ cnf(w_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w,w)),w)), \text{apply}(\text{apply}(b,b),b)))$ cnf(prove_strong_fixed_point, negated

COL003-6.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b,x),y),z) = \text{apply}(x, \text{apply}(y,z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w,x),y) = \text{apply}(\text{apply}(x,y),y)$ cnf(w_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w,w)),w)),b)),b))$ cnf(prove_strong_fixed_point, negated

COL003-7.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b,x),y),z) = \text{apply}(x, \text{apply}(y,z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w,x),y) = \text{apply}(\text{apply}(x,y),y)$ cnf(w_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w,w)), \text{apply}(b,w))),b)),b))$ cnf(prove_strong_fixed_poin

COL003-8.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b,x),y),z) = \text{apply}(x, \text{apply}(y,z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w,x),y) = \text{apply}(\text{apply}(x,y),y)$ cnf(w_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w,w)), \text{apply}(b,w))), \text{apply}(\text{apply}(b,b),b)))$ cnf(prove_strong_fixed_poin

COL003-9.p Strong fixed point for B and W
The strong fixed point property holds for the set P consisting of the combinators B and W alone, where ((Bx)y)z = x(yz) and (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b,x),y),z) = \text{apply}(x, \text{apply}(y,z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w,x),y) = \text{apply}(\text{apply}(x,y),y)$ cnf(w_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w,w)), \text{apply}(\text{apply}(b, \text{apply}(b,w)),b))),b))$ cnf(prove_strong_fixed_poin

COL004-1.p Find combinator equivalent to U from S and K
Construct from S and K alone a combinator that behaves as the combinator U does, where ((Sx)y)z = (xz)(yz), (Kx)y = x, (Ux)y = y((xx)y).
$\text{apply}(\text{apply}(\text{apply}(s,x),y),z) = \text{apply}(\text{apply}(x,z), \text{apply}(y,z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k,x),y) = x$ cnf(k_definition, axiom)
$\text{apply}(\text{apply}(z, f(z)), g(z)) \neq \text{apply}(g(z), \text{apply}(\text{apply}(f(z), f(z)), g(z)))$ cnf(prove_u_combinator, negated_conjecture)

COL004-3.p Find combinator equivalent to U from S and K.
Construct from S and K alone a combinator that behaves as the combinator U does, where ((Sx)y)z = (xz)(yz), (Kx)y = x, (Ux)y = y((xx)y).
$\text{apply}(\text{apply}(\text{apply}(s,x),y),z) = \text{apply}(\text{apply}(x,z), \text{apply}(y,z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k,x),y) = x$ cnf(k_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(s, \text{apply}(k, \text{apply}(s, \text{apply}(\text{apply}(s,k),k)))), \text{apply}(\text{apply}(s, \text{apply}(\text{apply}(s,k),k)), \text{apply}(\text{apply}(s,k),$
$\text{apply}(y, \text{apply}(\text{apply}(x,x),y))$ cnf(prove_u_combinator, negated_conjecture)

COL005-1.p Find a model for S and W but not a weak fixed point
The model one is seeking must satisfy S and W and fail to satisfy the weak fixed point property, where ((Sx)y)z = (xz)(yz), (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(s,x),y),z) = \text{apply}(\text{apply}(x,z), \text{apply}(y,z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(w,x),y) = \text{apply}(\text{apply}(x,y),y)$ cnf(w_definition, axiom)

$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_model, negated_conjecture)

COL006-1.p Strong fixed point for S and K
The strong fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz), (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL006-2.p Strong fixed point for S and K
The strong fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz), (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg \text{fixed\_point}(\text{apply}(\text{apply}(s, \text{apply}(k, \text{apply}(\text{apply}(s, \text{apply}(\text{apply}(s, k), k)), \text{apply}(\text{apply}(s, k), k)))), \text{apply}(\text{apply}(s, \text{apply}(k, \text{ap}$

COL006-3.p Strong fixed point for S and K
The strong fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz), (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg \text{fixed\_point}(\text{apply}(\text{apply}(s, \text{apply}(k, \text{apply}(\text{apply}(s, \text{apply}(\text{apply}(s, k), k)), \text{apply}(\text{apply}(s, k), k)))), \text{apply}(\text{apply}(s, \text{apply}(\text{appl}$

COL006-4.p Strong fixed point for S and K
The strong fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz), (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg \text{fixed\_point}(\text{apply}(\text{apply}(s, \text{apply}(k, \text{apply}(\text{apply}(\text{apply}(s, s), \text{apply}(\text{apply}(s, k), k)), \text{apply}(\text{apply}(s, s), \text{apply}(s, k))))), \text{apply}(\text{a}$

COL006-5.p Strong fixed point for S and K
The strong fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz), (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(s, \text{apply}(k, \text{apply}(\text{apply}(s, \text{apply}(\text{apply}(s, k), k)), \text{apply}(\text{apply}(s, k), k)))), \text{apply}(\text{apply}(s, \text{app}$
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL006-6.p Strong fixed point for S and K
The strong fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz), (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(s, \text{apply}(k, \text{apply}(\text{apply}(s, \text{apply}(\text{apply}(s, k), k)), \text{apply}(\text{apply}(s, k), k)))), \text{apply}(\text{apply}(s, \text{app}$
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL006-7.p Strong fixed point for S and K
The strong fixed point property holds for the set P consisting of the combinators S and K alone, where ((Sx)y)z = (xz)(yz), (Kx)y = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(s, \text{apply}(k, \text{apply}(\text{apply}(\text{apply}(s, s), \text{apply}(\text{apply}(s, k), k)), \text{apply}(\text{apply}(s, s), \text{apply}(s, k))))),$
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL007-1.p Weak fixed point for L
The weak fixed point property holds for the set P consisting of the combinator L, where (Lx)y = x(yy).
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL008-1.p Weak fixed point for M and B
The weak fixed point property holds for the set P consisting of the combinators M and B, where ((Bx)y)z = x(yz), Mx = xx.

$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL009-1.p Weak fixed point for B and L2
The weak fixed point property holds for the set P consisting of the combinators B and L2, where ((Bx)y)z = x(yz), (L2x)y = y(xx).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(l_2, x), y) = \text{apply}(y, \text{apply}(x, x))$ cnf(l2_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL010-1.p Weak fixed point for B and S2
The weak fixed point property holds for the set P consisting of the combinators B and S2, where ((Bx)y)z = x(yz), ((S2x)y)z = (xz)(yy).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(s_2, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, y))$ cnf(s2_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL011-1.p Weak fixed point for O and Q1
The weak fixed point property holds for the set P consisting of the combinators O and Q1, where (Ox)y = y(xy), ((Q1x)y)z = x(zy).
$\text{apply}(\text{apply}(o, x), y) = \text{apply}(y, \text{apply}(x, y))$ cnf(o_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(q_1, x), y), z) = \text{apply}(x, \text{apply}(z, y))$ cnf(q1_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL012-1.p Weak fixed point for U
The weak fixed point property holds for the set P consisting of the combinator U, where (Ux)y = y((xx)y).
$\text{apply}(\text{apply}(u, x), y) = \text{apply}(y, \text{apply}(\text{apply}(x, x), y))$ cnf(u_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL013-1.p Weak fixed point for S and L
The weak fixed point property holds for the set P consisting of the combinators S and L, where ((Sx)y)z = (xz)(yz), (Lx)y = x(yy).
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL014-1.p Weak fixed point for L and O
The weak fixed point property holds for the set P consisting of the combinators L and O, where (Lx)y = x(yy), (Ox)y = y(xy).
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$\text{apply}(\text{apply}(o, x), y) = \text{apply}(y, \text{apply}(x, y))$ cnf(o_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL015-1.p Weak fixed point for Q and M
The weak fixed point property holds for the set P consisting of the combinators Q and M, where Mx = xx, ((Qx)y)z = y(xz).
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(q, x), y), z) = \text{apply}(y, \text{apply}(x, z))$ cnf(q_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL016-1.p Weak fixed point for B, M and L
The weak fixed point property holds for the set P consisting of the combinators B, M and L, where ((Bx)y)z = x(yz), (Lx)y = x(yy), Mx = xx.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL017-1.p Weak fixed point for B, M, and T
The weak fixed point property holds for the set P consisting of the combinators B, M, and T, where ((Bx)y)z = x(yz), Mx = xx, (Tx)y = yx.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)

$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL018-1.p Weak fixed point for W, Q, and L
The weak fixed point property holds for the set P consisting of the combinators W, Q, and L, where (Lx)y = x(yy), (Wx)y = (xy)y, ((Qx)y)z = y(xz).
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(q, x), y), z) = \text{apply}(y, \text{apply}(x, z))$ cnf(q_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL019-1.p Weak fixed point for B, S, and T
The weak fixed point property holds for the set P consisting of the combinators B, S, and T, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), (Tx)y = yx.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL020-1.p Weak fixed point for B, S, and C
The weak fixed point property holds for the set P consisting of the combinators B, S, and C, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), ((Cx)y)z = (xz)y.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(c, x), y), z) = \text{apply}(\text{apply}(x, z), y)$ cnf(c_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL021-1.p Weak fixed point for B, M, and V
The weak fixed point property holds for the set P consisting of the combinators B, M, and V, where ((Bx)y)z = x(yz), Mx = xx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(v, x), y), z) = \text{apply}(\text{apply}(z, x), y)$ cnf(v_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL022-1.p Weak fixed point for B, O, and M
The weak fixed point property holds for the set P consisting of the combinators B, O, and M, where ((Bx)y)z = x(yz), Mx = xx, (Ox)y = y(xy).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$\text{apply}(\text{apply}(o, x), y) = \text{apply}(y, \text{apply}(x, y))$ cnf(o_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL023-1.p Weak fixed point for B and N
The weak fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL024-1.p Weak fixed point for B, M, and C
The weak fixed point property holds for the set P consisting of the combinators B, M, and C, where ((Bx)y)z = x(yz), Mx = xx, ((Cx)y)z = (xz)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(c, x), y), z) = \text{apply}(\text{apply}(x, z), y)$ cnf(c_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL025-1.p Weak fixed point for B and W
The weak fixed point property holds for the set P consisting of the combinators B and W, where ((Bx)y)z = x(yz), (Wx)y = (xy)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL026-1.p Weak fixed point for B and W1

The weak fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w_1, x), y) = \text{apply}(\text{apply}(y, x), x)$ cnf(w1_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL027-1.p Weak fixed point for B and H
The weak fixed point property holds for the set P consisting of the combinators B and H, where ((Bx)y)z = x(yz), ((Hx)y)z = ((xy)z)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(h, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, y), z), y)$ cnf(h_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL029-1.p Strong fixed point for U
The strong fixed point property holds for the set P consisting of the combinator U, where (Ux)y = y((xx)y).
$\text{apply}(\text{apply}(u, x), y) = \text{apply}(y, \text{apply}(\text{apply}(x, x), y))$ cnf(u_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL030-1.p Strong fixed point for S and L
The strong fixed point property holds for the set P consisting of the combinators S and L, where ((Sx)y)z = (xz)(yz), (Lx)y = x(yy).
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL031-1.p Strong fixed point for L and O
The strong fixed point property holds for the set P consisting of the combinators L and O, where (Lx)y = x(yy), (Ox)y = y(xy).
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$\text{apply}(\text{apply}(o, x), y) = \text{apply}(y, \text{apply}(x, y))$ cnf(o_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL032-1.p Strong fixed point for Q and M
The strong fixed point property holds for the set P consisting of the combinators Q and M, where Mx = xx, ((Qx)y)z = y(xz).
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(q, x), y), z) = \text{apply}(y, \text{apply}(x, z))$ cnf(q_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL033-1.p Strong fixed point for B, M and L
The strong fixed point property holds for the set P consisting of the combinators B, M and L, where ((Bx)y)z = x(yz), (Lx)y = x(yy), Mx = xx.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL034-1.p Strong fixed point for B, M, and T
The strong fixed point property holds for the set P consisting of the combinators B, M, and T, where ((Bx)y)z = x(yz), Mx = xx, (Tx)y = yx.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(m, x) = \text{apply}(x, x)$ cnf(m_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL035-1.p Strong fixed point for W, Q, and L
The strong fixed point property holds for the set P consisting of the combinators W, Q, and L, where (Lx)y = x(yy), (Wx)y = (xy)y, ((Qx)y)z = y(xz).
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$\text{apply}(\text{apply}(w, x), y) = \text{apply}(\text{apply}(x, y), y)$ cnf(w_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(q, x), y), z) = \text{apply}(y, \text{apply}(x, z))$ cnf(q_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL036-1.p Strong fixed point for B, S, and T

The strong fixed point property holds for the set P consisting of the combinators B, S, and T, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), (Tx)y = yx.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, z), \mathrm{apply}(y, z))$ cnf(s_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(y, f(y)) \neq \mathrm{apply}(f(y), \mathrm{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL037-1.p Strong fixed point for B, S, and C

The strong fixed point property holds for the set P consisting of the combinators B, S, and C, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), ((Cx)y)z = (xz)y.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, z), \mathrm{apply}(y, z))$ cnf(s_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(c, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, z), y)$ cnf(c_definition, axiom)
$\mathrm{apply}(y, f(y)) \neq \mathrm{apply}(f(y), \mathrm{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL038-1.p Strong fixed point for B, M, and V

The strong fixed point property holds for the set P consisting of the combinators B, M, and V, where ((Bx)y)z = x(yz), Mx = xx, ((Vx)y)z = (zx)y.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(m, x) = \mathrm{apply}(x, x)$ cnf(m_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(v, x), y), z) = \mathrm{apply}(\mathrm{apply}(z, x), y)$ cnf(v_definition, axiom)
$\mathrm{apply}(y, f(y)) \neq \mathrm{apply}(f(y), \mathrm{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL039-1.p Strong fixed point for B, O, and M

The strong fixed point property holds for the set P consisting of the combinators B, O, and M, where ((Bx)y)z = x(yz), Mx = xx, (Ox)y = y(xy).

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(m, x) = \mathrm{apply}(x, x)$ cnf(m_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(o, x), y) = \mathrm{apply}(y, \mathrm{apply}(x, y))$ cnf(o_definition, axiom)
$\mathrm{apply}(y, f(y)) \neq \mathrm{apply}(f(y), \mathrm{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL041-1.p Strong fixed point for B, M, and C

The strong fixed point property holds for the set P consisting of the combinators B, M, and C, where ((Bx)y)z = x(yz), Mx = xx, ((Cx)y)z = (xz)y.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(m, x) = \mathrm{apply}(x, x)$ cnf(m_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(c, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, z), y)$ cnf(c_definition, axiom)
$\mathrm{apply}(y, f(y)) \neq \mathrm{apply}(f(y), \mathrm{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL042-1.p Strong fixed point for B and W1

The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w_1, x), y) = \mathrm{apply}(\mathrm{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\mathrm{apply}(y, f(y)) \neq \mathrm{apply}(f(y), \mathrm{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL042-2.p Strong fixed point for B and W1

The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w_1, x), y) = \mathrm{apply}(\mathrm{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\mathrm{apply}(\mathrm{strong\_fixed\_point}, \mathrm{fixed\_pt}) = \mathrm{apply}(\mathrm{fixed\_pt}, \mathrm{apply}(\mathrm{strong\_fixed\_point}, \mathrm{fixed\_pt})) \Rightarrow \mathrm{fixed\_point}(\mathrm{strong\_fixed\_point})$
$\neg\, \mathrm{fixed\_point}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(w_1, w_1)), \mathrm{apply}(b, w_1))), b)), b))$ cnf(prove_strong_fixed_po

COL042-3.p Strong fixed point for B and W1

The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w_1, x), y) = \mathrm{apply}(\mathrm{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\mathrm{apply}(\mathrm{strong\_fixed\_point}, \mathrm{fixed\_pt}) = \mathrm{apply}(\mathrm{fixed\_pt}, \mathrm{apply}(\mathrm{strong\_fixed\_point}, \mathrm{fixed\_pt})) \Rightarrow \mathrm{fixed\_point}(\mathrm{strong\_fixed\_point})$
$\neg\, \mathrm{fixed\_point}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(w_1, w_1)), \mathrm{apply}(b, w_1))), \mathrm{apply}(\mathrm{apply}(b, b), b)))$ cnf(prove_strong_fixed_po

COL042-4.p Strong fixed point for B and W1

The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w_1, x), y) = \text{apply}(\text{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w_1, w_1)), \text{apply}(\text{apply}(b, \text{apply}(b, w_1)), b))), b))$ cnf(prove_strong_fixed_po

COL042-5.p Strong fixed point for B and W1
The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w_1, x), y) = \text{apply}(\text{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(w_1, w_1)), \text{apply}(\text{apply}(b, \text{apply}(b, w_1)), \text{apply}(\text{apply}(b, b), b))))$ cnf(prove_strong_fixed_po

COL042-6.p Strong fixed point for B and W1
The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w_1, x), y) = \text{apply}(\text{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w_1, w_1)), \text{apply}(b, w_1))), b)), b)$ cnf(strong_fixed_po
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL042-7.p Strong fixed point for B and W1
The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w_1, x), y) = \text{apply}(\text{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w_1, w_1)), \text{apply}(b, w_1))), \text{apply}(\text{apply}(b, b), b))$ cnf(strong_fixed_po
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL042-8.p Strong fixed point for B and W1
The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w_1, x), y) = \text{apply}(\text{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(w_1, w_1)), \text{apply}(\text{apply}(b, \text{apply}(b, w_1)), b))), b)$ cnf(strong_fixed_po
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL042-9.p Strong fixed point for B and W1
The strong fixed point property holds for the set P consisting of the combinators B and W1, where ((Bx)y)z = x(yz), (W1x)y = (yx)x.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(w_1, x), y) = \text{apply}(\text{apply}(y, x), x)$ cnf(w1_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(w_1, w_1)), \text{apply}(\text{apply}(b, \text{apply}(b, w_1)), \text{apply}(\text{apply}(b, b), b)))$ cnf(strong_fixed_po
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL043-1.p Strong fixed point for B and H
The strong fixed point property holds for the set P consisting of the combinators B and H, where ((Bx)y)z = x(yz), ((Hx)y)z = ((xy)z)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(h, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, y), z), y)$ cnf(h_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL043-2.p Strong fixed point for B and H
The strong fixed point property holds for the set P consisting of the combinators B and H, where ((Bx)y)z = x(yz), ((Hx)y)z = ((xy)z)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(h, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, y), z), y)$ cnf(h_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(h, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, h), \text{apply}(b, b))), \text{apply}(h, \text{appl}$

COL043-3.p Strong fixed point for B and H

The strong fixed point property holds for the set P consisting of the combinators B and H, where ((Bx)y)z = x(yz), ((Hx)y)z = ((xy)z)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(h, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, y), z), y)$ cnf(h_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(h, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, h), \text{apply}(b, b))), \text{apply}(h, \text{app}$
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL044-1.p Strong fixed point for B and N
The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL044-2.p Strong fixed point for B and N
The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(n, \text{apply}(\text{apply}(b, b), \text{apply}(\text{apply}(n, \text{apply}(\text{apply}(b, b), n)), n))), n)), b)$

COL044-3.p Strong fixed point for B and N
The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(n, \text{apply}(\text{apply}(b, b), \text{apply}(\text{apply}(n, \text{apply}(n, \text{apply}(b, b))), n))), n)), b)$

COL044-4.p Strong fixed point for B and N
The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(n, \text{apply}(n, \text{apply}(\text{apply}(b, \text{apply}(b, b)), \text{apply}(n, \text{apply}(\text{apply}(b, b), n)))$

COL044-5.p Strong fixed point for B and N
The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) = \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt})) \Rightarrow \text{fixed\_point}(\text{strong\_fixed\_point})$
$\neg\, \text{fixed\_point}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(n, \text{apply}(n, \text{apply}(\text{apply}(b, \text{apply}(b, b)), \text{apply}(n, \text{apply}(n, \text{apply}(b, b)))$

COL044-6.p Strong fixed point for B and N
The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(n, \text{apply}(\text{apply}(b, b), \text{apply}(\text{apply}(n, \text{apply}(\text{apply}(b, b), n)), n))$
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL044-7.p Strong fixed point for B and N
The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$\text{strong\_fixed\_point} = \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(n, \text{apply}(\text{apply}(b, b), \text{apply}(\text{apply}(n, \text{apply}(n, \text{apply}(b, b))), n))$
$\text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}) \neq \text{apply}(\text{fixed\_pt}, \text{apply}(\text{strong\_fixed\_point}, \text{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL044-8.p Strong fixed point for B and N

The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(n,x),y),z) = \mathrm{apply}(\mathrm{apply}(\mathrm{apply}(x,z),y),z)$ cnf(n_definition, axiom)
$\mathrm{strong\_fixed\_point} = \mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(\mathrm{apply}(n,\mathrm{apply}(n,\mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(b,b)),\mathrm{apply}(n,\mathrm{apply}(\mathrm{apply}(b$
$\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}) \neq \mathrm{apply}(\mathrm{fixed\_pt},\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL044-9.p Strong fixed point for B and N
The strong fixed point property holds for the set P consisting of the combinators B and N, where ((Bx)y)z = x(yz), ((Nx)y)z = ((xz)y)z.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(n,x),y),z) = \mathrm{apply}(\mathrm{apply}(\mathrm{apply}(x,z),y),z)$ cnf(n_definition, axiom)
$\mathrm{strong\_fixed\_point} = \mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(\mathrm{apply}(n,\mathrm{apply}(n,\mathrm{apply}(\mathrm{apply}(b,\mathrm{apply}(b,b)),\mathrm{apply}(n,\mathrm{apply}(n,\mathrm{apply}$
$\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}) \neq \mathrm{apply}(\mathrm{fixed\_pt},\mathrm{apply}(\mathrm{strong\_fixed\_point},\mathrm{fixed\_pt}))$ cnf(prove_strong_fixed_point, neg

COL045-1.p Weak fixed point for B, M and S
The weak fixed point property holds for the set P consisting of the combinators B, M and S, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), Mx = xx.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s,x),y),z) = \mathrm{apply}(\mathrm{apply}(x,z),\mathrm{apply}(y,z))$ cnf(s_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(m,x) = \mathrm{apply}(x,x)$ cnf(m_definition, axiom)
$y \neq \mathrm{apply}(\mathrm{combinator},y)$ cnf(prove_fixed_point, negated_conjecture)

COL046-1.p Strong fixed point for B, M and S
The strong fixed point property holds for the set P consisting of the combinators B, M and S, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), Mx = xx.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s,x),y),z) = \mathrm{apply}(\mathrm{apply}(x,z),\mathrm{apply}(y,z))$ cnf(s_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(m,x) = \mathrm{apply}(x,x)$ cnf(m_definition, axiom)
$\mathrm{apply}(y,f(y)) \neq \mathrm{apply}(f(y),\mathrm{apply}(y,f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL047-1.p Find a model for L and Q but not a strong fixed point
The model one is seeking must satisfy L and Q and fail to satisfy the strong fixed point property, where (Lx)y = x(yy), ((Qx)y)z = y(xz).

$\mathrm{apply}(\mathrm{apply}(l,x),y) = \mathrm{apply}(x,\mathrm{apply}(y,y))$ cnf(l_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(q,x),y),z) = \mathrm{apply}(y,\mathrm{apply}(x,z))$ cnf(q_definition, axiom)
$\mathrm{apply}(y,f(y)) \neq \mathrm{apply}(f(y),\mathrm{apply}(y,f(y)))$ cnf(prove_model, negated_conjecture)

COL048-1.p Weak fixed point for B, W, and M
The weak fixed point property holds for the set P consisting of the combinators B, W, and M, where ((Bx)y)z = x(yz), (Wx)y = (xy)y, Mx = xx.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w,x),y) = \mathrm{apply}(\mathrm{apply}(x,y),y)$ cnf(w_definition, axiom)
$\mathrm{apply}(m,x) = \mathrm{apply}(x,x)$ cnf(m_definition, axiom)
$y \neq \mathrm{apply}(\mathrm{combinator},y)$ cnf(prove_fixed_point, negated_conjecture)

COL049-1.p Strong fixed point for B, W, and M
The strong fixed point property holds for the set P consisting of the combinators B, W, and M, where ((Bx)y)z = x(yz), (Wx)y = (xy)y, Mx = xx.

$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b,x),y),z) = \mathrm{apply}(x,\mathrm{apply}(y,z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w,x),y) = \mathrm{apply}(\mathrm{apply}(x,y),y)$ cnf(w_definition, axiom)
$\mathrm{apply}(m,x) = \mathrm{apply}(x,x)$ cnf(m_definition, axiom)
$\mathrm{apply}(y,f(y)) \neq \mathrm{apply}(f(y),\mathrm{apply}(y,f(y)))$ cnf(prove_strong_fixed_point, negated_conjecture)

COL050-1.p The Significance of the Mockingbird
There exists a mocking bird. For all birds x and y, there exists a bird z that composes x with y for all birds w. Prove that every bird is fond of at least one other bird.

$\mathrm{response}(\mathrm{mocking\_bird},y) = \mathrm{response}(y,y)$ cnf(mocking_bird_exists, axiom)
$\mathrm{response}(x \circ y,w) = \mathrm{response}(x,\mathrm{response}(y,w))$ cnf(composer_exists, hypothesis)
$\mathrm{response}(a,y) \neq y$ cnf(prove_all_fond_of_another, negated_conjecture)

COL051-1.p Egocentric mocking bird?
There exists a mocking bird. For all birds x and y, there exists a bird z that composes x with y for all birds w. Prove that there exists a bird x that is fond of itself.

$\text{response}(\text{mocking\_bird}, y) = \text{response}(y, y) \qquad \text{cnf}(\text{mocking\_bird\_exists}, \text{axiom})$
$\text{response}(x \circ y, w) = \text{response}(x, \text{response}(y, w)) \qquad \text{cnf}(\text{composer\_exists}, \text{hypothesis})$
$\text{response}(x, x) \neq x \qquad \text{cnf}(\text{prove\_the\_bird\_exists}, \text{negated\_conjecture})$

COL052-1.p A Question on Agreeable Birds
For all birds x and y, there exists a bird z that composes x with y for all birds w. Prove that if C is agreeable then A is agreeable.
$\text{response}(x \circ y, w) = \text{response}(x, \text{response}(y, w)) \qquad \text{cnf}(\text{composer\_exists}, \text{axiom})$
$\text{response}(c, \text{common\_bird}(x)) = \text{response}(x, \text{common\_bird}(x)) \qquad \text{cnf}(\text{agreeable}_1, \text{hypothesis})$
$\text{response}(a, v) \neq \text{response}(\text{odd\_bird}, v) \qquad \text{cnf}(\text{prove\_a\_is\_agreeable}, \text{negated\_conjecture})$
$c = a \circ b \qquad \text{cnf}(\text{c\_composes\_a\_with\_b}, \text{hypothesis})$

COL052-2.p A Question on Agreeable Birds
For all birds x and y, there exists a bird z that composes x with y for all birds w. Prove that if C is agreeable then A is agreeable.
$\text{response}(x \circ y, w) = \text{response}(x, \text{response}(y, w)) \qquad \text{cnf}(\text{composer\_exists}, \text{axiom})$
$\text{agreeable}(x) \Rightarrow \text{response}(x, \text{common\_bird}(y)) = \text{response}(y, \text{common\_bird}(y)) \qquad \text{cnf}(\text{agreeable}_1, \text{axiom})$
$\text{response}(x, z) = \text{response}(\text{compatible}(x), z) \Rightarrow \text{agreeable}(x) \qquad \text{cnf}(\text{agreeable}_2, \text{axiom})$
$\text{agreeable}(c) \qquad \text{cnf}(\text{c\_is\_agreeable}, \text{hypothesis})$
$\neg\,\text{agreeable}(a) \qquad \text{cnf}(\text{prove\_a\_is\_agreeable}, \text{negated\_conjecture})$
$c = a \circ b \qquad \text{cnf}(\text{c\_composes\_a\_with\_b}, \text{hypothesis})$

COL053-1.p An Exercise in Composition
For all birds x and y, there exists a bird z that composes x with y for all birds w. Prove that for all birds x, y, and z, there exists a bird u such that for all w, uw = x(y(zw)).
$\text{response}(x \circ y, w) = \text{response}(x, \text{response}(y, w)) \qquad \text{cnf}(\text{composer\_exists}, \text{axiom})$
$\text{response}(u, f(u)) \neq \text{response}(a, \text{response}(b, \text{response}(c, f(u)))) \qquad \text{cnf}(\text{prove\_bird\_exists}, \text{negated\_conjecture})$

COL054-1.p Compatible Birds
There exists a mockingbird. For all birds x and y, there exists a bird z that composes x with y for all birds w. Prove that any two birds are compatible.
$\text{response}(\text{mocking\_bird}, y) = \text{response}(y, y) \qquad \text{cnf}(\text{mocking\_bird\_exists}, \text{axiom})$
$\text{response}(x \circ y, w) = \text{response}(x, \text{response}(y, w)) \qquad \text{cnf}(\text{composer\_exists}, \text{hypothesis})$
$\text{response}(a, x) = y \Rightarrow \text{response}(b, y) \neq x \qquad \text{cnf}(\text{prove\_birds\_are\_compatible}, \text{negated\_conjecture})$

COL055-1.p Happy Birds
There exists a bird which is fond of some other bird. Prove that any bird that is fond of at least one bird must be happy.
$\text{response}(a, b) = b \qquad \text{cnf}(\text{fond\_bird\_exists}, \text{hypothesis})$
$\text{response}(a, z) = w \Rightarrow \text{response}(a, w) \neq z \qquad \text{cnf}(\text{prove\_happiness}, \text{negated\_conjecture})$

COL056-1.p Normal Birds
For all birds x and y, there exists a bird z that composes x with y for all birds w. Prove that if there exists a happy bird then there exists a normal bird.
$\text{response}(x \circ y, w) = \text{response}(x, \text{response}(y, w)) \qquad \text{cnf}(\text{composer\_exists}, \text{axiom})$
$\text{response}(a, b) = c \qquad \text{cnf}(\text{a\_to\_b\_responds\_c}, \text{hypothesis})$
$\text{response}(a, c) = b \qquad \text{cnf}(\text{a\_to\_c\_responds\_b}, \text{hypothesis})$
$\text{response}(w, v) \neq v \qquad \text{cnf}(\text{prove\_there\_exists\_a\_happy\_bird}, \text{negated\_conjecture})$

COL057-1.p Strong fixed point for S, B, C, and I
The strong fixed point property holds for the set P consisting of the combinators S, B, C, and I, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz), ((Cx)y)z = (xz)y, and Ix = x.
$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z)) \qquad \text{cnf}(\text{s\_definition}, \text{axiom})$
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z)) \qquad \text{cnf}(\text{b\_definition}, \text{axiom})$
$\text{apply}(\text{apply}(\text{apply}(c, x), y), z) = \text{apply}(\text{apply}(x, z), y) \qquad \text{cnf}(\text{c\_definition}, \text{axiom})$
$\text{apply}(i, x) = x \qquad \text{cnf}(\text{i\_definition}, \text{axiom})$
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y))) \qquad \text{cnf}(\text{prove\_strong\_fixed\_point}, \text{negated\_conjecture})$

COL058-1.p If there's a lark, then there's an egocentric bird.
Suppose we are given a forest that conrtains a lark, and we are not given any other information. Prove that at least one bird in the forest must be egocentric.
$\text{response}(\text{response}(\text{lark}, x_1), x_2) = \text{response}(x_1, \text{response}(x_2, x_2)) \qquad \text{cnf}(\text{lark\_exists}, \text{axiom})$
$\text{response}(x, x) \neq x \qquad \text{cnf}(\text{prove\_the\_bird\_exists}, \text{negated\_conjecture})$

COL058-2.p If there's a lark, then there's an egocentric bird.

Suppose we are given a forest that contains a lark, and we are not given any other information. Prove that at least one bird in the forest must be egocentric.
$\text{response}(\text{response}(\text{lark}, x_1), x_2) = \text{response}(x_1, \text{response}(x_2, x_2))$ cnf(lark_exists, axiom)
$\text{response}(\text{response}(\text{response}(\text{lark}, \text{response}(\text{response}(\text{lark}, \text{response}(\text{lark}, \text{lark})), \text{response}(\text{lark}, \text{response}(\text{lark}, \text{lark})))), \text{response}($
$\text{response}(\text{response}(\text{lark}, \text{response}(\text{response}(\text{lark}, \text{response}(\text{lark}, \text{lark})), \text{response}(\text{lark}, \text{response}(\text{lark}, \text{lark})))), \text{response}(\text{lark}, \text{resp}$

COL058-3.p If there's a lark, then there's an egocentric bird.
Suppose we are given a forest that conrtains a lark, and we are not given any other information. Prove that at least one bird in the forest must be egocentric.
$\text{response}(\text{response}(\text{lark}, x_1), x_2) = \text{response}(x_1, \text{response}(x_2, x_2))$ cnf(lark_exists, axiom)
$\text{response}(\text{response}(\text{response}(\text{response}(\text{lark}, \text{lark}), \text{response}(\text{lark}, \text{response}(\text{lark}, \text{lark}))), \text{response}(\text{lark}, \text{response}(\text{lark}, \text{lark}))), \text{resp}$
$\text{response}(\text{response}(\text{response}(\text{lark}, \text{lark}), \text{response}(\text{lark}, \text{response}(\text{lark}, \text{lark}))), \text{response}(\text{lark}, \text{response}(\text{lark}, \text{lark})))$ cnf(prove

COL059-1.p L3 ((lark lark) lark) is not egocentric.
$\text{response}(\text{response}(\text{kestrel}, x_1), x_2) = x_1$ cnf(kestrel_exists, axiom)
$\text{response}(\text{response}(\text{lark}, x_1), x_2) = \text{response}(x_1, \text{response}(x_2, x_2))$ cnf(lark_exists, axiom)
$\text{response}(\text{response}(\text{response}(\text{lark}, \text{lark}), x_1), x_2) = \text{response}(\text{response}(x_1, x_1), \text{response}(x_2, x_2))$ cnf(lark_lemma$_1$, axiom)
$\text{response}(\text{response}(\text{response}(\text{response}(\text{lark}, \text{lark}), \text{lark}), x_1), x_2) = \text{response}(\text{response}(\text{response}(x_1, x_1), \text{response}(x_1, x_1)), \text{respon}$
$\text{response}(l_2, l_2) \neq l_2$ cnf(lark_not_egocentric, axiom)
$\text{response}(\text{lark}, \text{lark}) = l_2$ cnf(l2_definition, axiom)
$\text{response}(l_2, \text{lark}) = l_3$ cnf(l3_definition, axiom)
$\text{response}(l_3, l_3) = l_3$ cnf(prove_l3_not_egocentric, negated_conjecture)

COL060-1.p Find combinator equivalent to Q from B and T
Construct from B and T alone a combinator that behaves as the combinator Q does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Qx)y)z = y(xz).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(x, f(x)), g(x)), h(x)) \neq \text{apply}(g(x), \text{apply}(f(x), h(x)))$ cnf(prove_q_combinator, negated_conjecture)

COL060-2.p Find combinator equivalent to Q from B and T
Construct from B and T alone a combinator that behaves as the combinator Q does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Qx)y)z = y(xz).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(t, b)), \text{apply}(\text{apply}(b, b), t)), x), y), z) \neq \text{apply}(y, \text{apply}(x, z))$ cnf(prove_q_combina

COL060-3.p Find combinator equivalent to Q from B and T
Construct from B and T alone a combinator that behaves as the combinator Q does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Qx)y)z = y(xz).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(t, b)), b)), t), x), y), z) \neq \text{apply}(y, \text{apply}(x, z))$ cnf(prove_q_combina

COL061-1.p Find combinator equivalent to Q1 from B and T
Construct from B and T alone a combinator that behaves as the combinator Q1 does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Q1x)y)z = x(zy).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(x, f(x)), g(x)), h(x)) \neq \text{apply}(f(x), \text{apply}(h(x), g(x)))$ cnf(prove_q1_combinator, negated_conjecture)

COL061-2.p Find combinator equivalent to Q1 from B and T
Construct from B and T alone a combinator that behaves as the combinator Q1 does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Q1x)y)z = x(zy).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(t, t)), \text{apply}(\text{apply}(b, b), b)), x), y), z) \neq \text{apply}(x, \text{apply}(z, y))$ cnf(prove_q1_combin

COL061-3.p Find combinator equivalent to Q1 from B and T
Construct from B and T alone a combinator that behaves as the combinator Q1 does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Q1x)y)z = x(zy).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(t, t)), b)), b), x), y), z) \neq \text{apply}(x, \text{apply}(z, y))$ cnf(prove_q1_combin

COL062-1.p Find combinator equivalent to C from B and T
Construct from B and T alone a combinator that behaves as the combinator C does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Cx)y)z = (xz)y
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(x, f(x)), g(x)), h(x)) \neq \mathrm{apply}(\mathrm{apply}(f(x), h(x)), g(x))$ cnf(prove_c_combinator, negated_conjecture)

COL062-2.p Find combinator equivalent to C from B and T
Construct from B and T alone a combinator that behaves as the combinator C does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Cx)y)z = (xz)y
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, \mathrm{apply}(\mathrm{apply}(b, b), t))), \mathrm{apply}(\mathrm{apply}(b, b), t)), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(x, z), y)$ cn

COL062-3.p Find combinator equivalent to C from B and T
Construct from B and T alone a combinator that behaves as the combinator C does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Cx)y)z = (xz)y
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, \mathrm{apply}(\mathrm{apply}(b, b), t))), b)), t), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(x, z), y)$ cn

COL063-1.p Find combinator equivalent to F from B and T
Construct from B and T alone a combinator that behaves as the combinator F does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Fx)y)z = (zy)x.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(x, f(x)), g(x)), h(x)) \neq \mathrm{apply}(\mathrm{apply}(h(x), g(x)), f(x))$ cnf(prove_f_combinator, negated_conjecture)

COL063-2.p Find combinator equivalent to F from B and T
Construct from B and T alone a combinator that behaves as the combinator F does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Fx)y)z = (zy)x.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, t)), \mathrm{apply}(\mathrm{apply}(b, b), \mathrm{apply}(\mathrm{apply}(b, b), t))), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(z, y), x)$ cn

COL063-3.p Find combinator equivalent to F from B and T
Construct from B and T alone a combinator that behaves as the combinator F does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Fx)y)z = (zy)x.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, t)), b)), \mathrm{apply}(\mathrm{apply}(b, b), t)), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(z, y), x)$ cn

COL063-4.p Find combinator equivalent to F from B and T
Construct from B and T alone a combinator that behaves as the combinator F does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Fx)y)z = (zy)x.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, t)), \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, b), b)), t)), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(z, y), x)$ cn

COL063-5.p Find combinator equivalent to F from B and T
Construct from B and T alone a combinator that behaves as the combinator F does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Fx)y)z = (zy)x.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, t)), \mathrm{apply}(\mathrm{apply}(b, b), b))), t), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(z, y), x)$ cn

COL063-6.p Find combinator equivalent to F from B and T
Construct from B and T alone a combinator that behaves as the combinator F does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Fx)y)z = (zy)x.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, t)), b)), b)), t), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(z, y), x)$ cn

COL064-1.p Find combinator equivalent to V from B and T

Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(x, f(x)), g(x)), h(x)) \neq \text{apply}(\text{apply}(h(x), f(x)), g(x))$ cnf(prove_v_combinator, negated_conjecture)

COL064-10.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(t, \text{apply}(\text{apply}(b, b), t))), \text{apply}(\text{apply}(b, b), t))), t), x), y), z) \neq \text{apply}(\text{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-11.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(t, \text{apply}(\text{apply}(b, b), t))), b)), t)), t), x), y), z) \neq \text{apply}(\text{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-2.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(t, \text{apply}(\text{apply}(b, b), t))), \text{apply}(\text{apply}(b, b), \text{apply}(\text{apply}(b, b), t))), x), y), z) \neq \text{apply}(\text{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-3.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(t, \text{apply}(\text{apply}(b, b), t))), b)), \text{apply}(\text{apply}(b, b), t)), x), y), z) \neq \text{apply}(\text{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-4.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(t, \text{apply}(\text{apply}(b, b), t))), \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, b), b)), t)), x), y), z) \neq \text{apply}(\text{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-5.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(t, \text{apply}(\text{apply}(b, b), t))), \text{apply}(\text{apply}(b, b), b))), t), x), y), z) \neq \text{apply}(\text{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-6.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(t, x), y) = \text{apply}(y, x)$ cnf(t_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(\text{apply}(b, \text{apply}(t, \text{apply}(\text{apply}(b, b), t))), b)), b)), t), x), y), z) \neq \text{apply}(\text{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-7.p Find combinator equivalent to V from B and T

Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, \mathrm{apply}(\mathrm{apply}(b, b), t))), \mathrm{apply}(\mathrm{apply}(b, b), \mathrm{apply}(\mathrm{apply}(b, t), t))), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-8.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, \mathrm{apply}(\mathrm{apply}(b, b), t))), b)), \mathrm{apply}(\mathrm{apply}(b, t), t)), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL064-9.p Find combinator equivalent to V from B and T
Construct from B and T alone a combinator that behaves as the combinator V does, where ((Bx)y)z = x(yz), (Tx)y = yx, ((Vx)y)z = (zx)y.
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(t, \mathrm{apply}(\mathrm{apply}(b, b), t))), \mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(\mathrm{apply}(b, b), t)), t)), x), y), z) \neq \mathrm{apply}(\mathrm{apply}(z, x), y)$ cnf(prove_v_combinator, negated_conjecture)

COL065-1.p Find combinator equivalent to G from B and T
Construct from B and T alone a combinator that behaves as the combinator G does, where ((Bx)y)z = x(yz), (Tx)y = yx, (((Gx)y)z)w = (xw)(yz)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(t, x), y) = \mathrm{apply}(y, x)$ cnf(t_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(x, f(x)), g(x)), h(x)), i(x)) \neq \mathrm{apply}(\mathrm{apply}(f(x), i(x)), \mathrm{apply}(g(x), h(x)))$ cnf(prove_g_combinator

COL066-1.p Find combinator equivalent to P from B, Q and W
Construct from B, Q and W alone a combinator that behaves as the combinator P does, where ((Bx)y)z = x(yz), ((Qx)y)z = y(xz), (Wx)y = (xy)y, (((Px)y)y)z = (xy)((xy)z)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(q, x), y), z) = \mathrm{apply}(y, \mathrm{apply}(x, z))$ cnf(q_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w, x), y) = \mathrm{apply}(\mathrm{apply}(x, y), y)$ cnf(w_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(x, f(x)), g(x)), g(x)), h(x)) \neq \mathrm{apply}(\mathrm{apply}(f(x), g(x)), \mathrm{apply}(\mathrm{apply}(f(x), g(x)), h(x)))$ cnf(prove

COL066-2.p Find combinator equivalent to P from B, Q and W
Construct from B, Q and W alone a combinator that behaves as the combinator P does, where ((Bx)y)z = x(yz), ((Qx)y)z = y(xz), (Wx)y = (xy)y, (((Px)y)y)z = (xy)((xy)z)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(q, x), y), z) = \mathrm{apply}(y, \mathrm{apply}(x, z))$ cnf(q_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w, x), y) = \mathrm{apply}(\mathrm{apply}(x, y), y)$ cnf(w_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(q, q), \mathrm{apply}(w, \mathrm{apply}(q, \mathrm{apply}(q, q)))), x), y), y), z) \neq \mathrm{apply}(\mathrm{apply}(x, y), \mathrm{apply}(\mathrm{apply}(x, y$

COL066-3.p Find combinator equivalent to P from B, Q and W
Construct from B, Q and W alone a combinator that behaves as the combinator P does, where ((Bx)y)z = x(yz), ((Qx)y)z = y(xz), (Wx)y = (xy)y, (((Px)y)y)z = (xy)((xy)z)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(q, x), y), z) = \mathrm{apply}(y, \mathrm{apply}(x, z))$ cnf(q_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(w, x), y) = \mathrm{apply}(\mathrm{apply}(x, y), y)$ cnf(w_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, \mathrm{apply}(w, \mathrm{apply}(q, \mathrm{apply}(q, q)))), q), x), y), y), z) \neq \mathrm{apply}(\mathrm{apply}(x, y), \mathrm{apply}(\mathrm{apply}(x, y$

COL067-1.p Strong fixed point for B and S
The strong fixed point property holds for the set P consisting of the combinators B and S, where ((Sx)y)z = (xz)(yz), ((Bx)y)z = x(yz).
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(s, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, z), \mathrm{apply}(y, z))$ cnf(s_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(b, x), y), z) = \mathrm{apply}(x, \mathrm{apply}(y, z))$ cnf(b_definition, axiom)
$\mathrm{apply}(y, f(y)) \neq \mathrm{apply}(f(y), \mathrm{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL068-1.p Weak fixed point for B and S
The weak fixed point property holds for the set P consisting of the combinators B and S, where ((Sx)y)z (xz)(yz), ((Bx)y)z = x(yz).

$\text{apply}(\text{apply}(\text{apply}(s, x), y), z) = \text{apply}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(s_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL069-1.p Strong fixed point for B and L
The strong fixed point property holds for the set P consisting of the combinators B and L, where ((Bx)y)z = x(yz), (Lx)y = x(yy).
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(\text{apply}(l, x), y) = \text{apply}(x, \text{apply}(y, y))$ cnf(l_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL070-1.p Weak fixed point for B and N1
The weak fixed point property holds for the set P consisting of the combinators B and N1, where N1xyz = xyyz, ((Bx)y)z = x(yz).
$\text{apply}(\text{apply}(\text{apply}(n_1, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, y), y), z)$ cnf(n1_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$y \neq \text{apply}(\text{combinator}, y)$ cnf(prove_fixed_point, negated_conjecture)

COL071-1.p Strong fixed point for N and Q
The strong fixed point property holds for the set P consisting of the combinators N and Q, where ((Nx)y)z = ((xz)y)z, ((Qx)y)z = y(xz).
$\text{apply}(\text{apply}(\text{apply}(n, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, z), y), z)$ cnf(n_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(q, x), y), z) = \text{apply}(y, \text{apply}(x, z))$ cnf(q_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_fixed_point, negated_conjecture)

COL073-1.p Strong fixed point for B and N1
The strong fixed point property holds for the set P consisting of the combinators B and N1, where N1xyz = xyyz, ((Bx)y)z = x(yz).
$\text{apply}(\text{apply}(\text{apply}(n_1, x), y), z) = \text{apply}(\text{apply}(\text{apply}(x, y), y), z)$ cnf(n1_definition, axiom)
$\text{apply}(\text{apply}(\text{apply}(b, x), y), z) = \text{apply}(x, \text{apply}(y, z))$ cnf(b_definition, axiom)
$\text{apply}(y, f(y)) \neq \text{apply}(f(y), \text{apply}(y, f(y)))$ cnf(prove_strong_fixed_point, negated_conjecture)

COL074-1.p Unsatisfiable variant of TRC
If the function symbol K is replaced by the K combinator then the resultant system is inconsistent.
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, negated_conjecture)
$\text{apply}(\text{projection}_1, \text{pair}(x, y)) = x$ cnf(projection_1, axiom)
$\text{apply}(\text{projection}_2, \text{pair}(x, y)) = y$ cnf(projection_2, axiom)
$\text{pair}(\text{apply}(\text{projection}_1, x), \text{apply}(\text{projection}_2, x)) = x$ cnf(pairing, axiom)
$\text{apply}(\text{pair}(x, y), z) = \text{pair}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(pairwise_application, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{abstraction}, x), y), z) = \text{apply}(\text{apply}(x, \text{apply}(k, z)), \text{apply}(y, z))$ cnf(abstraction, negated_conjecture)
$\text{apply}(\text{eq}, \text{pair}(x, x)) = \text{projection}_1$ cnf(equality, axiom)
$x = y$ or $\text{apply}(\text{eq}, \text{pair}(x, y)) = \text{projection}_2$ cnf(extensionality_1, axiom)
$\text{apply}(x, n(x, y)) = \text{apply}(y, n(x, y)) \Rightarrow x = y$ cnf(extensionality_2, axiom)
$\text{projection}_1 \neq \text{projection}_2$ cnf(different_projections, axiom)

COL074-2.p Unsatisfiable variant of TRC
If the function symbol K is replaced by the K combinator then the resultant system is inconsistent.
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, negated_conjecture)
$\text{apply}(\text{projection}_1, \text{pair}(x, y)) = x$ cnf(projection_1, axiom)
$\text{apply}(\text{projection}_2, \text{pair}(x, y)) = y$ cnf(projection_2, axiom)
$\text{pair}(\text{apply}(\text{projection}_1, x), \text{apply}(\text{projection}_2, x)) = x$ cnf(pairing, axiom)
$\text{apply}(\text{pair}(x, y), z) = \text{pair}(\text{apply}(x, z), \text{apply}(y, z))$ cnf(pairwise_application, axiom)
$\text{apply}(\text{apply}(\text{apply}(\text{abstraction}, x), y), z) = \text{apply}(\text{apply}(x, \text{apply}(k, z)), \text{apply}(y, z))$ cnf(abstraction, negated_conjecture)
$\text{apply}(\text{eq}, \text{pair}(x, x)) = \text{projection}_1$ cnf(equality, axiom)
$x = y$ or $\text{apply}(\text{eq}, \text{pair}(x, y)) = \text{projection}_2$ cnf(extensionality_1, axiom)
$\text{apply}(x, n(x, y)) = \text{apply}(y, n(x, y)) \Rightarrow x = y$ cnf(extensionality_2, axiom)
$\text{projection}_1 \neq \text{projection}_2$ cnf(different_projections, axiom)
$\text{apply}(\text{apply}(f, x), y) = \text{apply}(x, x)$ cnf(diagonal_combinator, axiom)

COL074-3.p Unsatisfiable variant of TRC
If the function symbol K is replaced by the K combinator then the resultant system is inconsistent.
$\text{apply}(\text{apply}(k, x), y) = x$ cnf(k_definition, negated_conjecture)
$\text{apply}(\text{projection}_1, \text{pair}(x, y)) = x$ cnf(projection_1, axiom)

$\mathrm{apply}(\mathrm{projection}_2, \mathrm{pair}(x, y)) = y$ cnf(projection$_2$, axiom)
$\mathrm{pair}(\mathrm{apply}(\mathrm{projection}_1, x), \mathrm{apply}(\mathrm{projection}_2, x)) = x$ cnf(pairing, axiom)
$\mathrm{apply}(\mathrm{pair}(x, y), z) = \mathrm{pair}(\mathrm{apply}(x, z), \mathrm{apply}(y, z))$ cnf(pairwise_application, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{abstraction}, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, \mathrm{apply}(k, z)), \mathrm{apply}(y, z))$ cnf(abstraction, negated_conjecture)
$\mathrm{apply}(\mathrm{eq}, \mathrm{pair}(x, x)) = \mathrm{projection}_1$ cnf(equality, axiom)
$x = y$ or $\mathrm{apply}(\mathrm{eq}, \mathrm{pair}(x, y)) = \mathrm{projection}_2$ cnf(extensionality$_1$, axiom)
$\mathrm{apply}(x, n(x, y)) = \mathrm{apply}(y, n(x, y)) \Rightarrow x = y$ cnf(extensionality$_2$, axiom)
$\mathrm{projection}_1 \neq \mathrm{projection}_2$ cnf(different_projections, axiom)
$\mathrm{apply}(k, \mathrm{projection}_1) = \mathrm{k\_projection}_1$ cnf(k_projection$_1$, axiom)
$\mathrm{apply}(k, \mathrm{projection}_2) = \mathrm{k\_projection}_2$ cnf(k_projection$_2$, axiom)
$s = \mathrm{apply}(\mathrm{eq}, \mathrm{pair}(\mathrm{apply}(k, s), \mathrm{apply}(k, \mathrm{projection}_2)))$ cnf(self_referential, axiom)

COL075-1.p Lemma 1 for showing the unsatisfiable variant of TRC
Searching for a diagonal combinator F with the property f X Y = X X.
$\mathrm{apply}(\mathrm{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\mathrm{apply}(\mathrm{projection}_1, \mathrm{pair}(x, y)) = x$ cnf(projection$_1$, axiom)
$\mathrm{apply}(\mathrm{projection}_2, \mathrm{pair}(x, y)) = y$ cnf(projection$_2$, axiom)
$\mathrm{pair}(\mathrm{apply}(\mathrm{projection}_1, x), \mathrm{apply}(\mathrm{projection}_2, x)) = x$ cnf(pairing, axiom)
$\mathrm{apply}(\mathrm{pair}(x, y), z) = \mathrm{pair}(\mathrm{apply}(x, z), \mathrm{apply}(y, z))$ cnf(pairwise_application, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{abstraction}, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, \mathrm{apply}(k, z)), \mathrm{apply}(y, z))$ cnf(abstraction, axiom)
$\mathrm{apply}(\mathrm{eq}, \mathrm{pair}(x, x)) = \mathrm{projection}_1$ cnf(equality, axiom)
$x = y$ or $\mathrm{apply}(\mathrm{eq}, \mathrm{pair}(x, y)) = \mathrm{projection}_2$ cnf(extensionality$_1$, axiom)
$\mathrm{apply}(x, n(x, y)) = \mathrm{apply}(y, n(x, y)) \Rightarrow x = y$ cnf(extensionality$_2$, axiom)
$\mathrm{projection}_1 \neq \mathrm{projection}_2$ cnf(different_projections, axiom)
$\mathrm{apply}(\mathrm{apply}(y, b(y)), c(y)) \neq \mathrm{apply}(b(y), b(y))$ cnf(prove_diagonal_combinator, negated_conjecture)

COL075-2.p Lemma 1 for showing the unsatisfiable variant of TRC
Searching for a diagonal combinator F with the property f X Y = X X.
$\mathrm{apply}(\mathrm{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{abstraction}, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, \mathrm{apply}(k, z)), \mathrm{apply}(y, z))$ cnf(abstraction, axiom)
$\mathrm{apply}(\mathrm{apply}(y, b(y)), c(y)) \neq \mathrm{apply}(b(y), b(y))$ cnf(prove_diagonal_combinator, negated_conjecture)

COL076-1.p Lemma 2 for showing the unsatisfiable variant of TRC
Searching for the self-referential combinator with the property s = eq <k s,k p2>.
$\mathrm{apply}(\mathrm{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\mathrm{apply}(\mathrm{projection}_1, \mathrm{pair}(x, y)) = x$ cnf(projection$_1$, axiom)
$\mathrm{apply}(\mathrm{projection}_2, \mathrm{pair}(x, y)) = y$ cnf(projection$_2$, axiom)
$\mathrm{pair}(\mathrm{apply}(\mathrm{projection}_1, x), \mathrm{apply}(\mathrm{projection}_2, x)) = x$ cnf(pairing, axiom)
$\mathrm{apply}(\mathrm{pair}(x, y), z) = \mathrm{pair}(\mathrm{apply}(x, z), \mathrm{apply}(y, z))$ cnf(pairwise_application, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{abstraction}, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, \mathrm{apply}(k, z)), \mathrm{apply}(y, z))$ cnf(abstraction, axiom)
$\mathrm{apply}(\mathrm{eq}, \mathrm{pair}(x, x)) = \mathrm{projection}_1$ cnf(equality, axiom)
$x = y$ or $\mathrm{apply}(\mathrm{eq}, \mathrm{pair}(x, y)) = \mathrm{projection}_2$ cnf(extensionality$_1$, axiom)
$\mathrm{apply}(x, n(x, y)) = \mathrm{apply}(y, n(x, y)) \Rightarrow x = y$ cnf(extensionality$_2$, axiom)
$\mathrm{projection}_1 \neq \mathrm{projection}_2$ cnf(different_projections, axiom)
$\mathrm{apply}(\mathrm{apply}(f, x), y) = \mathrm{apply}(x, x)$ cnf(diagonal_combinator, axiom)
$y \neq \mathrm{apply}(\mathrm{eq}, \mathrm{pair}(\mathrm{apply}(k, y), \mathrm{apply}(k, \mathrm{projection}_2)))$ cnf(prove_self_referential, negated_conjecture)

COL076-2.p Lemma 2 for showing the unsatisfiable variant of TRC
Searching for the self-referential combinator with the property s = eq <k s,k p2>.
$\mathrm{apply}(\mathrm{apply}(k, x), y) = x$ cnf(k_definition, axiom)
$\mathrm{apply}(\mathrm{projection}_1, \mathrm{pair}(x, y)) = x$ cnf(projection$_1$, axiom)
$\mathrm{apply}(\mathrm{projection}_2, \mathrm{pair}(x, y)) = y$ cnf(projection$_2$, axiom)
$\mathrm{pair}(\mathrm{apply}(\mathrm{projection}_1, x), \mathrm{apply}(\mathrm{projection}_2, x)) = x$ cnf(pairing, axiom)
$\mathrm{apply}(\mathrm{pair}(x, y), z) = \mathrm{pair}(\mathrm{apply}(x, z), \mathrm{apply}(y, z))$ cnf(pairwise_application, axiom)
$\mathrm{apply}(\mathrm{apply}(\mathrm{apply}(\mathrm{abstraction}, x), y), z) = \mathrm{apply}(\mathrm{apply}(x, \mathrm{apply}(k, z)), \mathrm{apply}(y, z))$ cnf(abstraction, axiom)
$\mathrm{apply}(x, n(x, y)) = \mathrm{apply}(y, n(x, y)) \Rightarrow x = y$ cnf(extensionality$_2$, axiom)
$\mathrm{apply}(\mathrm{apply}(f, x), y) = \mathrm{apply}(x, x)$ cnf(diagonal_combinator, axiom)
$y \neq \mathrm{apply}(\mathrm{eq}, \mathrm{pair}(\mathrm{apply}(k, y), \mathrm{apply}(k, \mathrm{projection}_2)))$ cnf(prove_self_referential, negated_conjecture)

COL077-1.p Abst Abst Abst Abst Abst Abst = Id
include('Axioms/COL001-0.ax')
$\mathrm{apply}(\mathrm{identity}, x) = x$ cnf(identity_definition, axiom)

apply(apply(apply(apply(apply(abstraction, abstraction), abstraction), abstraction), abstraction), abstraction) $\neq$ identity

COL078-1.p Abst Abst Abst Abst = k(k(id))
include('Axioms/COL001-0.ax')
apply(identity, x) = x cnf(identity_definition, axiom)
apply(apply(apply(abstraction, abstraction), abstraction), abstraction) $\neq k(k(\text{identity}))$ cnf(prove_TRC1b, negated_conjec

COL078-2.p Abst Abst Abst Abst = k(k(id))
apply($k(x), y$) = x cnf(k_definition, axiom)
apply(apply(apply(abstraction, x), y), z) = apply(apply($x, k(z)$), apply(y, z)) cnf(abstraction, axiom)
apply($x, n(x, y)$) = apply($y, n(x, y)$) $\Rightarrow$ $x = y$ cnf(extensionality$_2$, axiom)
apply(identity, x) = x cnf(identity_definition, axiom)
apply(apply(apply(abstraction, abstraction), abstraction), abstraction) $\neq k(k(\text{identity}))$ cnf(prove_TRC1b, negated_conjec

COL079-1.p Abst(Abst(Abst X)) = Abst X
include('Axioms/COL001-0.ax')
apply(abstraction, apply(abstraction, apply(abstraction, b))) $\neq$ apply(abstraction, b) cnf(prove_TRC2a, negated_conjectur

COL079-2.p Abst(Abst(Abst X)) = Abst X
apply($k(x), y$) = x cnf(k_definition, axiom)
apply(apply(apply(abstraction, x), y), z) = apply(apply($x, k(z)$), apply(y, z)) cnf(abstraction, axiom)
apply($x, n(x, y)$) = apply($y, n(x, y)$) $\Rightarrow$ $x = y$ cnf(extensionality$_2$, axiom)
apply(abstraction, apply(abstraction, apply(abstraction, b))) $\neq$ apply(abstraction, b) cnf(prove_TRC2a, negated_conjectur

COL080-1.p Abst(Abst k(X)) = k(X)
include('Axioms/COL001-0.ax')
apply(identity, x) = x cnf(identity_definition, axiom)
$k(b) \neq$ apply(abstraction, apply(abstraction, $k(b)$)) cnf(prove_TRC2b, negated_conjecture)

COL080-2.p Abst(Abst k(X)) = k(X)
apply($k(x), y$) = x cnf(k_definition, axiom)
apply(apply(apply(abstraction, x), y), z) = apply(apply($x, k(z)$), apply(y, z)) cnf(abstraction, axiom)
apply($x, n(x, y)$) = apply($y, n(x, y)$) $\Rightarrow$ $x = y$ cnf(extensionality$_2$, axiom)
apply(identity, x) = x cnf(identity_definition, axiom)
$k(b) \neq$ apply(abstraction, apply(abstraction, $k(b)$)) cnf(prove_TRC2b, negated_conjecture)

COL081-1.p Abst k(k(X)) = k(k(X))
include('Axioms/COL001-0.ax')
apply(identity, x) = x cnf(identity_definition, axiom)
$k(k(b)) \neq$ apply(abstraction, $k(k(b))$) cnf(prove_TRC2c, negated_conjecture)

COL081-2.p Abst k(k(X)) = k(k(X))
apply($k(x), y$) = x cnf(k_definition, axiom)
apply(apply(apply(abstraction, x), y), z) = apply(apply($x, k(z)$), apply(y, z)) cnf(abstraction, axiom)
apply($x, n(x, y)$) = apply($y, n(x, y)$) $\Rightarrow$ $x = y$ cnf(extensionality$_2$, axiom)
apply(identity, x) = x cnf(identity_definition, axiom)
$k(k(b)) \neq$ apply(abstraction, $k(k(b))$) cnf(prove_TRC2c, negated_conjecture)

COL082-1.p Type-respecting combinators
include('Axioms/COL001-0.ax')

COL083-1.p Compatible Birds, part 1
response(mocking_bird, a) = response(a, a) cnf(mocking_bird_exists, axiom)
response($a \circ b, c$) = response(a, response(b, c)) cnf(composer_exists, hypothesis)
response(a, a) $\neq b$ cnf(prove_birds_are_compatible$_1$, negated_conjecture)

COL084-1.p Compatible Birds, part 2
response(mocking_bird, a) = response(a, a) cnf(mocking_bird_exists, axiom)
response($a \circ b, c$) = response(a, response(b, c)) cnf(composer_exists, hypothesis)
response(b, b) $\neq a$ cnf(prove_birds_are_compatible$_2$, negated_conjecture)

COL085-1.p Happy Birds, part 1
response(a, b) = b cnf(fond_bird_exists, hypothesis)
response(a, a) $\neq b$ cnf(prove_happiness$_1$, negated_conjecture)

COL086-1.p Happy Birds, part 2
response(a, b) = b cnf(fond_bird_exists, hypothesis)

response$(a, b) \neq a$ cnf(prove_happiness$_2$, negated_conjecture)

COL087-1.p Strong fixed point for B and M
The strong fixed point property holds for the set with the combinators B and M as a basis, where Bxyz = x(yz) and Mx = xx.
apply(apply(apply$(b, x), y), z) =$ apply$(x,$ apply$(y, z))$ cnf(definition_B, axiom)
apply$(m, x) =$ apply(x, x) cnf(definition_M, axiom)
apply$(y, f(y)) \neq$ apply$(f(y),$ apply$(y, f(y)))$ cnf(strong_fixpoint, negated_conjecture)

COL090-1.p i_contract_E
combK $\neq$ combS cnf(k_s, axiom)
combK $\neq$ comb_app(p, q) cnf(k_app, axiom)
combS $\neq$ comb_app(p, q) cnf(s_app, axiom)
comb_app$(p_1, q_1) =$ comb_app$(p_2, q_2) \Rightarrow p_1 = p_2$ cnf(app_app$_1$, axiom)
comb_app$(p_1, q_1) =$ comb_app$(p_2, q_2) \Rightarrow q_1 = q_2$ cnf(app_app$_2$, axiom)
$(p_1 = p_2$ and $q_1 = q_2) \Rightarrow$ comb_app$(p_1, q_1) =$ comb_app(p_2, q_2) cnf(app_app$_3$, axiom)
comb_app$(p, q) \in$ comb $\Rightarrow p \in$ comb cnf(ap_E$_1$, axiom)
comb_app$(p, q) \in$ comb $\Rightarrow q \in$ comb cnf(ap_E$_2$, axiom)
combK $\in$ comb cnf(comb_intros$_1$, axiom)
combS $\in$ comb cnf(comb_intros$_2$, axiom)
$(p \in$ comb and $q \in$ comb$) \Rightarrow$ comb_app$(p, q) \in$ comb cnf(comb_intros$_3$, axiom)
$a \in$ comb $\Rightarrow$ pair$(a, a) \in$ rtrancl(contract) cnf(reduction_refl, axiom)
$(p \in$ comb and $q \in$ comb$) \Rightarrow$ pair(comb_app(comb_app(combK$, p), q), p) \in$ contract cnf(contract_K, axiom)
$(p \in$ comb and $q \in$ comb and $r \in$ comb$) \Rightarrow$ pair(comb_app(comb_app(comb_app(combS$, p), q), r),$ comb_app(comb_app$(p, r),$
contract cnf(contract_S, axiom)
pair(comb_app$(p, q), r) \in$ contract $\Rightarrow$ (ap_contractE_c$_1(p, q, r)$ or ap_contractE_c$_2(p, q, r)$ or ap_contractE_c$_3(p, q, r)$ or ap_co
ap_contractE_c$_1(p, q, r) \Rightarrow r \in$ comb cnf(ap_contractE$_2$, axiom)
ap_contractE_c$_1(p, q, r) \Rightarrow q \in$ comb cnf(ap_contractE$_3$, axiom)
ap_contractE_c$_1(p, q, r) \Rightarrow p =$ comb_app(combK$, r)$ cnf(ap_contractE$_4$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow$ ap_contractE_sk1p$(p, q, r) \in$ comb cnf(ap_contractE$_5$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow$ ap_contractE_sk1q$(p, q, r) \in$ comb cnf(ap_contractE$_6$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow q \in$ comb cnf(ap_contractE$_7$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow r =$ comb_app(comb_app(ap_contractE_sk1p$(p, q, r), q),$ comb_app(ap_contractE_sk1q$(p, q, r), q))$
ap_contractE_c$_2(p, q, r) \Rightarrow p =$ comb_app(comb_app(combS, ap_contractE_sk1p$(p, q, r)),$ ap_contractE_sk1q$(p, q, r))$ cnf(a
ap_contractE_c$_3(p, q, r) \Rightarrow$ pair$(p,$ ap_contractE_sk2q$(p, q, r)) \in$ contract cnf(ap_contractE$_{10}$, axiom)
ap_contractE_c$_3(p, q, r) \Rightarrow q \in$ comb cnf(ap_contractE$_{11}$, axiom)
ap_contractE_c$_3(p, q, r) \Rightarrow r =$ comb_app(ap_contractE_sk2q$(p, q, r), q)$ cnf(ap_contractE$_{12}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow$ pair$(q,$ ap_contractE_sk3q$(p, q, r)) \in$ contract cnf(ap_contractE$_{13}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow p \in$ comb cnf(ap_contractE$_{14}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow r =$ comb_app$(p,$ ap_contractE_sk3q$(p, q, r))$ cnf(ap_contractE$_{15}$, axiom)
$\neg$ pair(combK$, r) \in$ contract cnf(k_contractE, axiom)
$\neg$ pair(combS$, r) \in$ contract cnf(s_contractE, axiom)
pair(comb_app(comb_app(combS, combK), combK)$, r) \in$ contract cnf(i_contract_E, negated_conjecture)

COL090-3.p i_contract_E
combK $\neq$ combS cnf(k_s, axiom)
combK $\neq$ comb_app(p, q) cnf(k_app, axiom)
combS $\neq$ comb_app(p, q) cnf(s_app, axiom)
comb_app$(p_1, q_1) =$ comb_app$(p_2, q_2) \Rightarrow p_1 = p_2$ cnf(app_app$_1$, axiom)
comb_app$(p_1, q_1) =$ comb_app$(p_2, q_2) \Rightarrow q_1 = q_2$ cnf(app_app$_2$, axiom)
$(p_1 = p_2$ and $q_1 = q_2) \Rightarrow$ comb_app$(p_1, q_1) =$ comb_app(p_2, q_2) cnf(app_app$_3$, axiom)
pair(comb_app$(p, q), r) \in$ contract $\Rightarrow$ (ap_contractE_c$_1(p, q, r)$ or ap_contractE_c$_2(p, q, r)$ or ap_contractE_c$_3(p, q, r)$ or ap_co
ap_contractE_c$_1(p, q, r) \Rightarrow r \in$ comb cnf(ap_contractE$_2$, axiom)
ap_contractE_c$_1(p, q, r) \Rightarrow q \in$ comb cnf(ap_contractE$_3$, axiom)
ap_contractE_c$_1(p, q, r) \Rightarrow p =$ comb_app(combK$, r)$ cnf(ap_contractE$_4$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow$ ap_contractE_sk1p$(p, q, r) \in$ comb cnf(ap_contractE$_5$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow$ ap_contractE_sk1q$(p, q, r) \in$ comb cnf(ap_contractE$_6$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow q \in$ comb cnf(ap_contractE$_7$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow r =$ comb_app(comb_app(ap_contractE_sk1p$(p, q, r), q),$ comb_app(ap_contractE_sk1q$(p, q, r), q))$
ap_contractE_c$_2(p, q, r) \Rightarrow p =$ comb_app(comb_app(combS, ap_contractE_sk1p$(p, q, r)),$ ap_contractE_sk1q$(p, q, r))$ cnf(a
ap_contractE_c$_3(p, q, r) \Rightarrow$ pair$(p,$ ap_contractE_sk2q$(p, q, r)) \in$ contract cnf(ap_contractE$_{10}$, axiom)

ap_contractE_c$_3(p, q, r) \Rightarrow q \in$ comb   cnf(ap_contractE$_{11}$, axiom)
ap_contractE_c$_3(p, q, r) \Rightarrow r =$ comb_app(ap_contractE_sk2q$(p, q, r), q)$ cnf(ap_contractE$_{12}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow$ pair$(q,$ ap_contractE_sk3q$(p, q, r)) \in$ contract   cnf(ap_contractE$_{13}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow p \in$ comb   cnf(ap_contractE$_{14}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow r =$ comb_app$(p,$ ap_contractE_sk3q$(p, q, r))$ cnf(ap_contractE$_{15}$, axiom)
$\neg$ pair(combK, $r) \in$ contract   cnf(k_contractE, axiom)
$\neg$ pair(combS, $r) \in$ contract   cnf(s_contractE, axiom)
pair(comb_app(comb_app(combS, combK), combK), $r) \in$ contract   cnf(i_contract_E, negated_conjecture)

COL091-1.p k1_contractD_c1
comb.app(K, p) -1→ r ==> EX q. r = comb.app(K, q) & p -1→ q
combK $\neq$ combS   cnf(k_s, axiom)
combK $\neq$ comb_app(p, q) cnf(k_app, axiom)
combS $\neq$ comb_app(p, q) cnf(s_app, axiom)
comb_app$(p_1, q_1) =$ comb_app$(p_2, q_2) \Rightarrow p_1 = p_2$ cnf(app_app$_1$, axiom)
comb_app$(p_1, q_1) =$ comb_app$(p_2, q_2) \Rightarrow q_1 = q_2$ cnf(app_app$_2$, axiom)
$(p_1 = p_2$ and $q_1 = q_2) \Rightarrow$ comb_app$(p_1, q_1) =$ comb_app(p_2, q_2) cnf(app_app$_3$, axiom)
comb_app$(p, q) \in$ comb $\Rightarrow p \in$ comb   cnf(ap_E$_1$, axiom)
comb_app$(p, q) \in$ comb $\Rightarrow q \in$ comb   cnf(ap_E$_2$, axiom)
combK $\in$ comb   cnf(comb_intros$_1$, axiom)
combS $\in$ comb   cnf(comb_intros$_2$, axiom)
$(p \in$ comb and $q \in$ comb$) \Rightarrow$ comb_app$(p, q) \in$ comb   cnf(comb_intros$_3$, axiom)
$a \in$ comb $\Rightarrow$ pair$(a, a) \in$ rtrancl(contract)   cnf(reduction_refl, axiom)
$(p \in$ comb and $q \in$ comb$) \Rightarrow$ pair(comb_app(comb_app(combK, $p), q), p) \in$ contract   cnf(contract_K, axiom)
$(p \in$ comb and $q \in$ comb and $r \in$ comb$) \Rightarrow$ pair(comb_app(comb_app(comb_app(combS, $p), q), r),$ comb_app(comb_app$(p, r),$
contract   cnf(contract_S, axiom)
pair(comb_app$(p, q), r) \in$ contract $\Rightarrow$ (ap_contractE_c$_1(p, q, r)$ or ap_contractE_c$_2(p, q, r)$ or ap_contractE_c$_3(p, q, r)$ or ap_co
ap_contractE_c$_1(p, q, r) \Rightarrow r \in$ comb   cnf(ap_contractE$_2$, axiom)
ap_contractE_c$_1(p, q, r) \Rightarrow q \in$ comb   cnf(ap_contractE$_3$, axiom)
ap_contractE_c$_1(p, q, r) \Rightarrow p =$ comb_app(combK, $r)$ cnf(ap_contractE$_4$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow$ ap_contractE_sk1p$(p, q, r) \in$ comb   cnf(ap_contractE$_5$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow$ ap_contractE_sk1q$(p, q, r) \in$ comb   cnf(ap_contractE$_6$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow q \in$ comb   cnf(ap_contractE$_7$, axiom)
ap_contractE_c$_2(p, q, r) \Rightarrow r =$ comb_app(comb_app(ap_contractE_sk1p$(p, q, r), q),$ comb_app(ap_contractE_sk1q$(p, q, r), q))$
ap_contractE_c$_2(p, q, r) \Rightarrow p =$ comb_app(comb_app(combS, ap_contractE_sk1p$(p, q, r)),$ ap_contractE_sk1q$(p, q, r))$ cnf(a
ap_contractE_c$_3(p, q, r) \Rightarrow$ pair$(p,$ ap_contractE_sk2q$(p, q, r)) \in$ contract   cnf(ap_contractE$_{10}$, axiom)
ap_contractE_c$_3(p, q, r) \Rightarrow q \in$ comb   cnf(ap_contractE$_{11}$, axiom)
ap_contractE_c$_3(p, q, r) \Rightarrow r =$ comb_app(ap_contractE_sk2q$(p, q, r), q)$ cnf(ap_contractE$_{12}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow$ pair$(q,$ ap_contractE_sk3q$(p, q, r)) \in$ contract   cnf(ap_contractE$_{13}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow p \in$ comb   cnf(ap_contractE$_{14}$, axiom)
ap_contractE_c$_4(p, q, r) \Rightarrow r =$ comb_app$(p,$ ap_contractE_sk3q$(p, q, r))$ cnf(ap_contractE$_{15}$, axiom)
$\neg$ pair(combK, $r) \in$ contract   cnf(k_contractE, axiom)
$\neg$ pair(combS, $r) \in$ contract   cnf(s_contractE, axiom)
pair(comb_app(combK, $p), r) \in$ contract   cnf(k1_contractD_h$_1$, hypothesis)
$r =$ comb_app(combK, $q) \Rightarrow \neg$ pair$(p, q) \in$ contract   cnf(k1_contractD_c$_1$, negated_conjecture)

COL098-1.p diamond_strip_lemmaD_2c1
[rule_format]:[— diamond(r); <x, y> : r∧+ —]
combK $\neq$ combS   cnf(k_s, axiom)
combK $\neq$ comb_app(p, q) cnf(k_app, axiom)
combS $\neq$ comb_app(p, q) cnf(s_app, axiom)
comb_app$(p_1, q_1) =$ comb_app$(p_2, q_2) \Rightarrow p_1 = p_2$ cnf(app_app$_1$, axiom)
comb_app$(p_1, q_1) =$ comb_app$(p_2, q_2) \Rightarrow q_1 = q_2$ cnf(app_app$_2$, axiom)
$(p_1 = p_2$ and $q_1 = q_2) \Rightarrow$ comb_app$(p_1, q_1) =$ comb_app(p_2, q_2) cnf(app_app$_3$, axiom)
pair$(a, b) \in r \Rightarrow$ pair$(a, b) \in$ trancl(r) cnf(r_into_trancl, axiom)
trans(trancl(r))   cnf(trans_trancl, axiom)
(trans(r) and pair$(a, b) \in r$ and pair$(b, c) \in r) \Rightarrow$ pair$(a, c) \in r$ cnf(transD, axiom)
(pair$(x, y) \in r$ and pair$(x,$ yP$) \in r) \Rightarrow$ pair$(y,$ sk$_1(x, y,$ yP$)) \in r$ cnf(diamond_strip_lemmaD_2h$_1$, hypothesis)
(pair$(x, y) \in r$ and pair$(x,$ yP$) \in r) \Rightarrow$ pair(yP, sk$_1(x, y,$ yP$)) \in r$ cnf(diamond_strip_lemmaD_2h$_2$, hypothesis)
pair$(x, y) \in$ trancl(r) cnf(diamond_strip_lemmaD_2h$_3$, hypothesis)

pair(y, z) $\in r$ cnf(diamond_strip_lemmaD_2h$_4$, hypothesis)
pair(x, yP) $\in r \Rightarrow$ pair(yP, sk$_2$(yP)) $\in$ trancl(r) cnf(diamond_strip_lemmaD_2h$_5$, hypothesis)
pair(x, yP) $\in r \Rightarrow$ pair(y, sk$_2$(yP)) $\in r$ cnf(diamond_strip_lemmaD_2h$_6$, hypothesis)
pair(x, sk$_3$) $\in r$ cnf(diamond_strip_lemmaD_2c$_1$, negated_conjecture)
pair(sk$_3$, zA) $\in$ trancl(r) $\Rightarrow \neg$ pair(z, zA) $\in r$ cnf(diamond_strip_lemmaD_2c$_2$, negated_conjecture)

COL099-1.p diamond_trancl_1c1
diamond(r) ==> diamond(r∧+)
combK $\neq$ combS cnf(k_s, axiom)
combK $\neq$ comb_app(p, q) cnf(k_app, axiom)
combS $\neq$ comb_app(p, q) cnf(s_app, axiom)
comb_app(p_1, q_1) = comb_app(p_2, q_2) $\Rightarrow p_1 = p_2$ cnf(app_app$_1$, axiom)
comb_app(p_1, q_1) = comb_app(p_2, q_2) $\Rightarrow q_1 = q_2$ cnf(app_app$_2$, axiom)
($p_1 = p_2$ and $q_1 = q_2$) $\Rightarrow$ comb_app(p_1, q_1) = comb_app(p_2, q_2) cnf(app_app$_3$, axiom)
pair(a, b) $\in r \Rightarrow$ pair(a, b) $\in$ trancl(r) cnf(r_into_trancl, axiom)
trans(trancl(r)) cnf(trans_trancl, axiom)
(trans(r) and pair(a, b) $\in r$ and pair(b, c) $\in r$) $\Rightarrow$ pair(a, c) $\in r$ cnf(transD, axiom)
(diamond(r) and pair(x, y) $\in$ trancl(r) and pair(x, yP) $\in r$) $\Rightarrow$ pair(yP, diamond_strip_lemmaD_sk$_1$(x, y, yP, r)) $\in$ trancl(r) cnf(diamond_strip_lemmaD$_1$, axiom)
(diamond(r) and pair(x, y) $\in$ trancl(r) and pair(x, yP) $\in r$) $\Rightarrow$ pair(y, diamond_strip_lemmaD_sk$_1$(x, y, yP, r)) $\in$ r cnf(diamond_strip_lemmaD$_2$, axiom)
diamond(r) cnf(diamond_trancl_1h$_1$, hypothesis)
pair(y, ya) $\in r$ cnf(diamond_trancl_1h$_2$, hypothesis)
pair(y, yp) $\in$ trancl(r) cnf(diamond_trancl_1c$_1$, negated_conjecture)
pair(ya, z) $\in$ trancl(r) $\Rightarrow \neg$ pair(yp, z) $\in$ trancl(r) cnf(diamond_trancl_1c$_2$, negated_conjecture)

COL100-1.p diamond_trancl_2c1
diamond(r) ==> diamond(r∧+)
combK $\neq$ combS cnf(k_s, axiom)
combK $\neq$ comb_app(p, q) cnf(k_app, axiom)
combS $\neq$ comb_app(p, q) cnf(s_app, axiom)
comb_app(p_1, q_1) = comb_app(p_2, q_2) $\Rightarrow p_1 = p_2$ cnf(app_app$_1$, axiom)
comb_app(p_1, q_1) = comb_app(p_2, q_2) $\Rightarrow q_1 = q_2$ cnf(app_app$_2$, axiom)
($p_1 = p_2$ and $q_1 = q_2$) $\Rightarrow$ comb_app(p_1, q_1) = comb_app(p_2, q_2) cnf(app_app$_3$, axiom)
pair(a, b) $\in r \Rightarrow$ pair(a, b) $\in$ trancl(r) cnf(r_into_trancl, axiom)
trans(trancl(r)) cnf(trans_trancl, axiom)
(trans(r) and pair(a, b) $\in r$ and pair(b, c) $\in r$) $\Rightarrow$ pair(a, c) $\in r$ cnf(transD, axiom)
(diamond(r) and pair(x, y) $\in$ trancl(r) and pair(x, yP) $\in r$) $\Rightarrow$ pair(yP, diamond_strip_lemmaD_sk$_1$(x, y, yP, r)) $\in$ trancl(r) cnf(diamond_strip_lemmaD$_1$, axiom)
(diamond(r) and pair(x, y) $\in$ trancl(r) and pair(x, yP) $\in r$) $\Rightarrow$ pair(y, diamond_strip_lemmaD_sk$_1$(x, y, yP, r)) $\in$ r cnf(diamond_strip_lemmaD$_2$, axiom)
diamond(r) cnf(diamond_trancl_2h$_1$, hypothesis)
pair(y, ya) $\in$ trancl(r) cnf(diamond_trancl_2h$_2$, hypothesis)
pair(ya, z) $\in r$ cnf(diamond_trancl_2h$_3$, hypothesis)
pair(y, yP) $\in$ trancl(r) $\Rightarrow$ pair(ya, sk$_1$(yP)) $\in$ trancl(r) cnf(diamond_trancl_2h$_4$, hypothesis)
pair(y, yP) $\in$ trancl(r) $\Rightarrow$ pair(yP, sk$_1$(yP)) $\in$ trancl(r) cnf(diamond_trancl_2h$_5$, hypothesis)
pair(y, yp) $\in$ trancl(r) cnf(diamond_trancl_2c$_1$, negated_conjecture)
pair(z, zA) $\in$ trancl(r) $\Rightarrow \neg$ pair(yp, zA) $\in$ trancl(r) cnf(diamond_trancl_2c$_2$, negated_conjecture)

COL101-1.p Problem about combinators
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc
$\neg$ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), tc_Comb_Ocomb, tc_Comb_Ocomb

COL101-2.p Problem about combinators
$\neg$ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), tc_Comb_Ocomb, tc_Comb_Ocomb
c_in(c_Pair(v_a, v_a, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc

COL102-1.p Problem about combinators

include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc
c_in(c_Pair(v_x, v_y, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Transitive__Closure_Ortrancl(c_Comb_Ocontract, tc_Comb_Ocomb)
c_in(c_Pair(v_y, v_za, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_z), tc_Comb_Ocomb, tc_Comb_Ocomb),
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_za, v_z), tc_Comb_Ocomb, tc_Comb_Ocom

COL102-2.p Problem about combinators
c_in(c_Pair(v_y, v_za, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_z), tc_Comb_Ocomb, tc_Comb_Ocomb),
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_za, v_z), tc_Comb_Ocomb, tc_Comb_Ocom
c_in(c_Pair(v_x, v_y, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)) ⇒
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_z), tc_Comb_Ocomb, tc_Comb_Ocomb),
c_in(v_p, v_r, tc_prod(t_a, t_a)) ⇒ c_in(v_p, c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__C
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc

COL103-1.p Problem about combinators
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_x, v_y, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Transitive__Closure_Ortrancl(c_Comb_Ocontract, tc_Comb_Ocomb)
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_z), tc_Comb_Ocomb, tc_Comb_Ocomb),
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), tc_Comb_Ocomb, tc_Comb_Ocomb

COL103-2.p Problem about combinators
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), tc_Comb_Ocomb, tc_Comb_Ocomb
c_in(c_Pair(v_a, v_a, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc

COL104-1.p Problem about combinators
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_x, v_y, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Transitive__Closure_Ortrancl(c_Comb_Ocontract, tc_Comb_Ocomb)
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_z), tc_Comb_Ocomb, tc_Comb_Ocomb),
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc
c_in(c_Pair(v_x, v_y, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Transitive__Closure_Ortrancl(c_Comb_Ocontract, tc_Comb_Ocomb)
c_in(c_Pair(v_y, v_za, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), c_Comb_Ocomb_Oop_A_D_D(v_z, v_y), tc_Comb_Ocomb, tc_Comb_Ocomb),
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), c_Comb_Ocomb_Oop_A_D_D(v_z, v_za), tc_Comb_Ocomb, tc_Comb_Ocom

COL104-2.p Problem about combinators
c_in(c_Pair(v_y, v_za, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), c_Comb_Ocomb_Oop_A_D_D(v_z, v_y), tc_Comb_Ocomb, tc_Comb_Ocomb),
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), c_Comb_Ocomb_Oop_A_D_D(v_z, v_za), tc_Comb_Ocomb, tc_Comb_Ocom
c_in(c_Pair(v_x, v_y, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)) ⇒
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), c_Comb_Ocomb_Oop_A_D_D(v_z, v_y), tc_Comb_Ocomb, tc_Comb_Ocomb),
c_in(v_p, v_r, tc_prod(t_a, t_a)) ⇒ c_in(v_p, c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__C
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc

COL105-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_x, v_xb, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))

c_in(c_Pair(v_xb, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)

COL105-2.p Problem about combinators
c_in(c_Pair(v_x, v_xb, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_xb, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(v_x, v_x, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))

COL106-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x), v_ya), v_xb, tc_Comb_Ocomb
c_in(c_Pair(v_xb, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)

COL107-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x),
c_in(c_Pair(v_xb, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_ya, v_z)), v_U

COL108-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_x, v_ya, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), v_xba, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(
c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_ya, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oc
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_w, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
c_in(c_Pair(v_xba, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_ya, v_w), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod

COL109-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_xb, v_x_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb
c_in(c_Pair(v_yb, v_y_Ha, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocom
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_xb, v_z), c_Comb_Ocomb_Oop_A_D_D(v_yb, v_z)), v_U
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_xb), v_yb), v_U, tc_Comb_Ocomb
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x_H), v_y_Ha), v_xc(v_U), tc_Com
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_xb), v_yb), v_U, tc_Comb_Ocomb
c_in(c_Pair(v_U, v_xc(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oc
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_w, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O

c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O

COL109-2.p Problem about combinators
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_xb, v_x_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb
c_in(c_Pair(v_yb, v_y_Ha, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocon
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_xb, v_z), c_Comb_Ocomb_Oop_A_D_D(v_yb, v_z)), v_U
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x).
(c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_w), tc_Comb_Ocomb, tc_Comb_Ocomb)

COL110-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_x, v_ya, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_x, v_yb, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_z, v_wa, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_yb, v_wa), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_ya, v_w), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod
c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_ya, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oc
c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oc
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_w, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O

COL110-2.p Problem about combinators
c_in(c_Pair(v_x, v_yb, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_z, v_wa, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_yb, v_wa), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_ya, v_w), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod
c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_ya, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oc
c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oc
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_w, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
(c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_w), tc_Comb_Ocomb, tc_Comb_Ocomb)

COL111-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_x, v_y_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(v_y_H, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)

COL111-2.p Problem about combinators
c_in(c_Pair(v_x, v_y_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(v_y_H, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)

c_in(c_Pair(v_x, v_x, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))

COL112-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x), v_ya), v_U, tc_Comb_Ocomb,
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)

COL112-2.p Problem about combinators
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x), v_ya), v_U, tc_Comb_Ocomb,
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(v_x, v_x, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x), v_y), v_x, tc_Comb_Ocomb, t

COL113-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
¬ c_in(c_Pair(v_y_H, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocon

COL113-2.p Problem about combinators
¬ c_in(c_Pair(v_y_H, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocon
c_in(c_Pair(v_x, v_x, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))

COL114-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_ya, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_x, v_x_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x_H), v_w), v_U, tc_Comb_Ocom
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)

COL114-2.p Problem about combinators
c_in(c_Pair(v_x, v_x_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x_H), v_w), v_U, tc_Comb_Ocom
¬ c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x), v_y), v_x, tc_Comb_Ocomb, t

COL115-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x),
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_ya, v_z)), v_U

COL115-2.p Problem about combinators
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x),
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_ya, v_z)), v_U
c_in(c_Pair(v_x, v_x, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x),

COL116-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_xb, v_z), c_Comb_Ocomb_Oop_A_D_D(v_yb, v_z)), v

COL116-2.p Problem about combinators

¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_xb, v_z), c_Comb_Ocomb_Oop_A_D_D(v_yb, v_z)), v
c_in(c_Pair(v_x, v_x, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))

COL117-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_x, v_x_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(v_ya, v_y_Ha, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocom
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x_
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_ya, v_z)), v_U

COL117-2.p Problem about combinators
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_x, v_x_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)
c_in(c_Pair(v_ya, v_y_Ha, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocom
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x_
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_ya, v_z)), v_U
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OS, v_x).
(c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_w), tc_Comb_Ocomb, tc_Comb_Ocomb)

COL118-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_x, v_ya, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_ya, v_w), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod
c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_ya, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
c_in(c_Pair(v_x, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oc
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_w, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O

COL118-2.p Problem about combinators
c_in(c_Pair(v_x, v_ya, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_ya, v_w), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod
c_in(c_Pair(v_x, v_x, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
(c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_w), tc_Comb_Ocomb, tc_Comb_Ocomb)

COL119-1.p Problem about combinators
include('Axioms/COL002-1.ax')
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_z, v_w, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_y_H, v_x_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocom
c_in(c_Pair(v_y_H, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x_H), v_w), v_U, tc_Comb_Oco
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_y_H), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Opar
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x_H), v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb

c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_y_H), v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparc
c_in(c_Pair(v_U, v_xb(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oc
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_w, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O
c_in(c_Pair(v_z, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb))
c_in(c_Pair(v_U, v_xaa(v_U), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_O

COL119-2.p Problem about combinators
c_in(c_Pair(v_y_H, v_x_H, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocon
c_in(c_Pair(v_y_H, v_U, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Oparcontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb
¬ c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x_H), v_w), v_U, tc_Comb_Oco
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x), v_y), v_x, tc_Comb_Ocomb, t

COL120-1.p Problem about combinators
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_Comb_Ocomb_OK ≠ c_Comb_Ocomb_OS   cnf(cls_Comb_Ocomb_Odistinct__1__iff1$_0$, axiom)
c_Comb_Ocomb_OS ≠ c_Comb_Ocomb_OK   cnf(cls_Comb_Ocomb_Odistinct__2__iff1$_0$, axiom)
c_Comb_Ocomb_OK ≠ c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H)   cnf(cls_Comb_Ocomb_Odistinct__3__iff1$_0$, axi
c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ≠ c_Comb_Ocomb_OK   cnf(cls_Comb_Ocomb_Odistinct__4__iff1$_0$, axi
c_Comb_Ocomb_OS ≠ c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H)   cnf(cls_Comb_Ocomb_Odistinct__5__iff1$_0$, axio
c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ≠ c_Comb_Ocomb_OS   cnf(cls_Comb_Ocomb_Odistinct__6__iff1$_0$, axio
c_Comb_Ocomb_Oop_A_D_D(v_comb$_1$, v_comb$_2$) = c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ⇒ v_comb$_1$ = v_comb1_H   cnf(cls_Comb_Ocomb_Oinject__iff1$_0$, axiom)
c_Comb_Ocomb_Oop_A_D_D(v_comb$_1$, v_comb$_2$) = c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ⇒ v_comb$_2$ = v_comb2_H   cnf(cls_Comb_Ocomb_Oinject__iff1$_1$, axiom)
(c_Comb_Odiamond(v_r, t_a) and c_in(c_Pair(v_x, v_y_H, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_x, v_y, t_a, t_a), c_Tra
c_in(c_Pair(v_y_H, c_Comb_Odiamond__strip__lemmaE$_{-1}$(v_r, v_y, v_y_H, t_a), t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a),
(c_Comb_Odiamond(v_r, t_a) and c_in(c_Pair(v_x, v_y_H, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_x, v_y, t_a, t_a), c_Tra
c_in(c_Pair(v_y, c_Comb_Odiamond__strip__lemmaE$_{-1}$(v_r, v_y, v_y_H, t_a), t_a, t_a), v_r, tc_prod(t_a, t_a))   cnf(cls_Comb_Od
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a))   cnf(cls_Transitive__Closure_Ortranc
c_Comb_Odiamond(v_r, t_a)   cnf(cls_conjecture$_0$, negated_conjecture)
c_in(c_Pair(v_y, v_x, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a))   cnf(cls_conjecture$_1$, negated_conjec
c_in(c_Pair(v_x, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) ⇒ ¬ c_in(c_Pair(v_y, v_U, t_a, t_a), c_T

COL120-2.p Problem about combinators
c_in(c_Pair(v_y, v_x, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a))   cnf(cls_conjecture$_1$, negated_conjec
c_in(c_Pair(v_x, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) ⇒ ¬ c_in(c_Pair(v_y, v_U, t_a, t_a), c_T
c_in(c_Pair(v_a, v_a, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a))   cnf(cls_Transitive__Closure_Ortranc

COL121-1.p Problem about combinators
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_Comb_Ocomb_OK ≠ c_Comb_Ocomb_OS   cnf(cls_Comb_Ocomb_Odistinct__1__iff1$_0$, axiom)
c_Comb_Ocomb_OS ≠ c_Comb_Ocomb_OK   cnf(cls_Comb_Ocomb_Odistinct__2__iff1$_0$, axiom)
c_Comb_Ocomb_OK ≠ c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H)   cnf(cls_Comb_Ocomb_Odistinct__3__iff1$_0$, axi
c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ≠ c_Comb_Ocomb_OK   cnf(cls_Comb_Ocomb_Odistinct__4__iff1$_0$, axi
c_Comb_Ocomb_OS ≠ c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H)   cnf(cls_Comb_Ocomb_Odistinct__5__iff1$_0$, axio
c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ≠ c_Comb_Ocomb_OS   cnf(cls_Comb_Ocomb_Odistinct__6__iff1$_0$, axio
c_Comb_Ocomb_Oop_A_D_D(v_comb$_1$, v_comb$_2$) = c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ⇒ v_comb$_1$ = v_comb1_H   cnf(cls_Comb_Ocomb_Oinject__iff1$_0$, axiom)
c_Comb_Ocomb_Oop_A_D_D(v_comb$_1$, v_comb$_2$) = c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ⇒ v_comb$_2$ = v_comb2_H   cnf(cls_Comb_Ocomb_Oinject__iff1$_1$, axiom)
(c_Comb_Odiamond(v_r, t_a) and c_in(c_Pair(v_x, v_y_H, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_x, v_y, t_a, t_a), c_Tra
c_in(c_Pair(v_y_H, c_Comb_Odiamond__strip__lemmaE$_{-1}$(v_r, v_y, v_y_H, t_a), t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a),
(c_Comb_Odiamond(v_r, t_a) and c_in(c_Pair(v_x, v_y_H, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_x, v_y, t_a, t_a), c_Tra
c_in(c_Pair(v_y, c_Comb_Odiamond__strip__lemmaE$_{-1}$(v_r, v_y, v_y_H, t_a), t_a, t_a), v_r, tc_prod(t_a, t_a))   cnf(cls_Comb_Od
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a))   cnf(cls_Transitive__Closure_Ortranc
c_Comb_Odiamond(v_r, t_a)   cnf(cls_conjecture$_0$, negated_conjecture)

c_in(c_Pair(v_y, v_ya, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_conjecture$_1$, negated_conje
c_in(c_Pair(v_ya, v_z, t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_conjecture$_2$, negated_conjecture)
c_in(c_Pair(v_y, v_xaa, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_conjecture$_3$, negated_conj
c_in(c_Pair(v_y, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) ⇒ c_in(c_Pair(v_ya, v_x(v_U), t_a, t_a
c_in(c_Pair(v_y, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) ⇒ c_in(c_Pair(v_U, v_x(v_U), t_a, t_a)
c_in(c_Pair(v_xaa, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) ⇒ ¬ c_in(c_Pair(v_z, v_U, t_a, t_a), c

COL121-2.p Problem about combinators
(c_Comb_Odiamond(v_r, t_a) and c_in(c_Pair(v_x, v_y_H, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_x, v_y, t_a, t_a), c_Tra
c_in(c_Pair(v_y_H, c_Comb_Odiamond__strip__lemmaE$_{-1}$(v_r, v_y, v_y_H, t_a), t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a),
(c_Comb_Odiamond(v_r, t_a) and c_in(c_Pair(v_x, v_y_H, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_x, v_y, t_a, t_a), c_Tra
c_in(c_Pair(v_y, c_Comb_Odiamond__strip__lemmaE$_{-1}$(v_r, v_y, v_y_H, t_a), t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_Comb_Od
c_in(v_p, v_r, tc_prod(t_a, t_a)) ⇒ c_in(v_p, c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__C
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc
c_Comb_Odiamond(v_r, t_a) cnf(cls_conjecture$_0$, negated_conjecture)
c_in(c_Pair(v_ya, v_z, t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_conjecture$_2$, negated_conjecture)
c_in(c_Pair(v_y, v_xaa, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_conjecture$_3$, negated_conj
c_in(c_Pair(v_y, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) ⇒ c_in(c_Pair(v_ya, v_x(v_U), t_a, t_a
c_in(c_Pair(v_y, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) ⇒ c_in(c_Pair(v_U, v_x(v_U), t_a, t_a)
c_in(c_Pair(v_xaa, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) ⇒ ¬ c_in(c_Pair(v_z, v_U, t_a, t_a), c

COL122-1.p Problem about combinators
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_Comb_Ocomb_OK ≠ c_Comb_Ocomb_OS cnf(cls_Comb_Ocomb_Odistinct__1__iff1$_0$, axiom)
c_Comb_Ocomb_OS ≠ c_Comb_Ocomb_OK cnf(cls_Comb_Ocomb_Odistinct__2__iff1$_0$, axiom)
c_Comb_Ocomb_OK ≠ c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) cnf(cls_Comb_Ocomb_Odistinct__3__iff1$_0$, axi
c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ≠ c_Comb_Ocomb_OK cnf(cls_Comb_Ocomb_Odistinct__4__iff1$_0$, axi
c_Comb_Ocomb_OS ≠ c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) cnf(cls_Comb_Ocomb_Odistinct__5__iff1$_0$, axio
c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ≠ c_Comb_Ocomb_OS cnf(cls_Comb_Ocomb_Odistinct__6__iff1$_0$, axio
c_Comb_Ocomb_Oop_A_D_D(v_comb$_1$, v_comb$_2$) = c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ⇒ v_comb$_1$ =
v_comb1_H cnf(cls_Comb_Ocomb_Oinject__iff1$_0$, axiom)
c_Comb_Ocomb_Oop_A_D_D(v_comb$_1$, v_comb$_2$) = c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ⇒ v_comb$_2$ =
v_comb2_H cnf(cls_Comb_Ocomb_Oinject__iff1$_1$, axiom)
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc
c_in(c_Pair(v_x, v_xaa, t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_conjecture$_0$, negated_conjecture)
c_in(c_Pair(v_x, v_U, t_a, t_a), v_r, tc_prod(t_a, t_a)) ⇒ ¬ c_in(c_Pair(v_xaa, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t
(c_in(c_Pair(v_U, v_W, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_U, v_V, t_a, t_a), v_r, tc_prod(t_a, t_a))) ⇒ c_in(c_Pair(
(c_in(c_Pair(v_U, v_W, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_U, v_V, t_a, t_a), v_r, tc_prod(t_a, t_a))) ⇒ c_in(c_Pair(

COL122-2.p Problem about combinators
c_in(c_Pair(v_x, v_xaa, t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_conjecture$_0$, negated_conjecture)
c_in(c_Pair(v_x, v_U, t_a, t_a), v_r, tc_prod(t_a, t_a)) ⇒ ¬ c_in(c_Pair(v_xaa, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t
c_in(c_Pair(v_a, v_a, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc

COL123-1.p Problem about combinators
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_Comb_Ocomb_OK ≠ c_Comb_Ocomb_OS cnf(cls_Comb_Ocomb_Odistinct__1__iff1$_0$, axiom)
c_Comb_Ocomb_OS ≠ c_Comb_Ocomb_OK cnf(cls_Comb_Ocomb_Odistinct__2__iff1$_0$, axiom)
c_Comb_Ocomb_OK ≠ c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) cnf(cls_Comb_Ocomb_Odistinct__3__iff1$_0$, axi
c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ≠ c_Comb_Ocomb_OK cnf(cls_Comb_Ocomb_Odistinct__4__iff1$_0$, axi
c_Comb_Ocomb_OS ≠ c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) cnf(cls_Comb_Ocomb_Odistinct__5__iff1$_0$, axio
c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ≠ c_Comb_Ocomb_OS cnf(cls_Comb_Ocomb_Odistinct__6__iff1$_0$, axio
c_Comb_Ocomb_Oop_A_D_D(v_comb$_1$, v_comb$_2$) = c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ⇒ v_comb$_1$ =
v_comb1_H cnf(cls_Comb_Ocomb_Oinject__iff1$_0$, axiom)
c_Comb_Ocomb_Oop_A_D_D(v_comb$_1$, v_comb$_2$) = c_Comb_Ocomb_Oop_A_D_D(v_comb1_H, v_comb2_H) ⇒ v_comb$_2$ =
v_comb2_H cnf(cls_Comb_Ocomb_Oinject__iff1$_1$, axiom)

(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc
c_in(c_Pair(v_x, v_y, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_conjecture$_0$, negated_conjec
c_in(c_Pair(v_y, v_z, t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_conjecture$_1$, negated_conjecture)
c_in(c_Pair(v_x, v_xb, t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_conjecture$_2$, negated_conjecture)
c_in(c_Pair(v_x, v_U, t_a, t_a), v_r, tc_prod(t_a, t_a)) ⇒ c_in(c_Pair(v_U, v_xaa(v_U), t_a, t_a), c_Transitive__Closure_Ortrancl(v
c_in(c_Pair(v_x, v_U, t_a, t_a), v_r, tc_prod(t_a, t_a)) ⇒ c_in(c_Pair(v_y, v_xaa(v_U), t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_c
c_in(c_Pair(v_z, v_U, t_a, t_a), v_r, tc_prod(t_a, t_a)) ⇒ ¬ c_in(c_Pair(v_xb, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a
(c_in(c_Pair(v_U, v_W, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_U, v_V, t_a, t_a), v_r, tc_prod(t_a, t_a))) ⇒ c_in(c_Pair(
(c_in(c_Pair(v_U, v_W, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_U, v_V, t_a, t_a), v_r, tc_prod(t_a, t_a))) ⇒ c_in(c_Pair(

COL123-2.p Problem about combinators
c_in(v_p, v_r, tc_prod(t_a, t_a)) ⇒ c_in(v_p, c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__C
(c_in(c_Pair(v_b, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) and c_in(c_Pair(v_a, v_b, t_a, t_a), c_Tr
c_in(c_Pair(v_a, v_c, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a), tc_prod(t_a, t_a)) cnf(cls_Transitive__Closure_Ortranc
c_in(c_Pair(v_y, v_z, t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_conjecture$_1$, negated_conjecture)
c_in(c_Pair(v_x, v_xb, t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_conjecture$_2$, negated_conjecture)
c_in(c_Pair(v_x, v_U, t_a, t_a), v_r, tc_prod(t_a, t_a)) ⇒ c_in(c_Pair(v_U, v_xaa(v_U), t_a, t_a), c_Transitive__Closure_Ortrancl(v
c_in(c_Pair(v_x, v_U, t_a, t_a), v_r, tc_prod(t_a, t_a)) ⇒ c_in(c_Pair(v_y, v_xaa(v_U), t_a, t_a), v_r, tc_prod(t_a, t_a)) cnf(cls_c
c_in(c_Pair(v_z, v_U, t_a, t_a), v_r, tc_prod(t_a, t_a)) ⇒ ¬ c_in(c_Pair(v_xb, v_U, t_a, t_a), c_Transitive__Closure_Ortrancl(v_r, t_a
(c_in(c_Pair(v_U, v_W, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_U, v_V, t_a, t_a), v_r, tc_prod(t_a, t_a))) ⇒ c_in(c_Pair(
(c_in(c_Pair(v_U, v_W, t_a, t_a), v_r, tc_prod(t_a, t_a)) and c_in(c_Pair(v_U, v_V, t_a, t_a), v_r, tc_prod(t_a, t_a))) ⇒ c_in(c_Pair(

COL124-1.p Problem about combinators
include('Axioms/COL002-0.ax')
include('Axioms/MSC001-2.ax')
include('Axioms/MSC001-0.ax')
c_in(c_Pair(v_x, v_y, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Transitive__Closure_Ortrancl(c_Comb_Ocontract, tc_Comb_Ocomb)
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_x, v_z), c_Comb_Ocomb_Oop_A_D_D(v_y, v_z), tc_Comb_Ocomb, tc_Comb_Ocomb),
c_in(c_Pair(v_x, v_y, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Transitive__Closure_Ortrancl(c_Comb_Ocontract, tc_Comb_Ocomb)
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(v_z, v_x), c_Comb_Ocomb_Oop_A_D_D(v_z, v_y), tc_Comb_Ocomb, tc_Comb_Ocomb),
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, c_Comb_OI), c_Comb_Ocomb_Oop
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, c_Comb_OI), c_Comb_Ocomb_Oop
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, c_Comb_OI), c_Comb_Ocomb_Oop
(c_in(c_Pair(v_U, v_W, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)) a
c_in(c_Pair(v_V, v_x(v_U, v_V, v_W), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Con
(c_in(c_Pair(v_U, v_W, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)) a
c_in(c_Pair(v_W, v_x(v_U, v_V, v_W), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Con

COL124-2.p Problem about combinators
(c_in(c_Pair(v_U, v_W, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Ocomb)) a
c_in(c_Pair(v_V, v_x(v_U, v_V, v_W), tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Con
¬ c_in(c_Pair(c_Comb_OI, v_z, tc_Comb_Ocomb, tc_Comb_Ocomb), c_Comb_Ocontract, tc_prod(tc_Comb_Ocomb, tc_Comb_Oco
c_in(c_Pair(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_Oop_A_D_D(c_Comb_Ocomb_OK, v_x), v_y), v_x, tc_Comb_Ocomb, t