SEV axioms
SEV problems

SEV000∧5.p TPS problem MODULAR-EQUIV-THM
The equivalence of two definitions of modularity.
a: $tType thf(a_type, type)
∀jOIN: $a \to a \to a$, mEET: $a \to a \to a$: ((∀xx: a: (jOIN@xx@xx) = xx and ∀xx: a: (mEET@xx@xx) = xx and ∀xx: a, xy: a, xz: a: (jOIN@(jOIN@xx@xy)@xz) = (jOIN@xx@(jOIN@xy@xz)) and ∀xx: a, xy: a, xz: a: (mEET@(mEE (mEET@xx@(mEET@xy@xz)) and ∀xx: a, xy: a: (jOIN@xx@xy) = (jOIN@xy@xx) and ∀xx: a, xy: a: (mEET@xx@xy) = (mEET@xy@xx) and ∀xx: a, xy: a: (jOIN@(mEET@xx@xy)@xy) = xy and ∀xx: a, xy: a: (mEET@(jOIN@xx@xy)@xy) = xy) ⇒ (∀xx: a, xy: a, xz: a: ((jOIN@xx@xz) = xz ⇒ (jOIN@xx@(mEET@xy@xz)) = (mEET@(jOIN@xx@xy)@xz)) ⟺ ∀xx: a, xy: a, xz: a: (jOIN@xx@(mEET@xy@(jOIN@xx@xz))) = (mEET@(jOIN@xx@xy)@(jOIN@xx@xz)))) thf(cMODU

SEV001∧5.p TPS problem DISTRIB-THM
In a lattice, join distributes over meet iff meet distributes over join.
a: $tType thf(a_type, type)
∀jOIN: $a \to a \to a$, mEET: $a \to a \to a$: ((∀xx: a: (jOIN@xx@xx) = xx and ∀xx: a: (mEET@xx@xx) = xx and ∀xx: a, xy: a, xz: a: (jOIN@(jOIN@xx@xy)@xz) = (jOIN@xx@(jOIN@xy@xz)) and ∀xx: a, xy: a, xz: a: (mEET@(mEE (mEET@xx@(mEET@xy@xz)) and ∀xx: a, xy: a: (jOIN@xx@xy) = (jOIN@xy@xx) and ∀xx: a, xy: a: (mEET@xx@xy) = (mEET@xy@xx) and ∀xx: a, xy: a: (jOIN@(mEET@xx@xy)@xy) = xy and ∀xx: a, xy: a: (mEET@(jOIN@xx@xy)@xy) = xy) ⇒ (∀xx: a, xy: a, xz: a: (jOIN@xx@(mEET@xy@xz)) = (mEET@(jOIN@xx@xy)@(jOIN@xx@xz)) ⟺ ∀xx: a, xy: a, xz: a: (mEET@xx@(jOIN@xy@xz)) = (jOIN@(mEET@xx@xy)@(mEET@xx@xz)))) thf(cDISTRIB_THM_p

SEV002∧5.p TPS problem from LATTICES-THMS
a: $tType thf(a_type, type)
∀jOIN: $a \to a \to a$, mEET: $a \to a \to a$: ((∀xx: a: (jOIN@xx@xx) = xx and ∀xx: a: (mEET@xx@xx) = xx and ∀xx: a, xy: a, xz: a: (jOIN@(jOIN@xx@xy)@xz) = (jOIN@xx@(jOIN@xy@xz)) and ∀xx: a, xy: a, xz: a: (mEET@(mEE (mEET@xx@(mEET@xy@xz)) and ∀xx: a, xy: a: (jOIN@xx@xy) = (jOIN@xy@xx) and ∀xx: a, xy: a: (mEET@xx@xy) = (mEET@xy@xx) and ∀xx: a, xy: a: (jOIN@(mEET@xx@xy)@xy) = xy and ∀xx: a, xy: a: (mEET@(jOIN@xx@xy)@xy) = xy and ∀xx: a, xy: a, xz: a: (jOIN@xx@(mEET@xy@xz)) = (mEET@(jOIN@xx@xy)@(jOIN@xx@xz)) and ∀xx: a, xy: a, xz: a (jOIN@(mEET@xx@xy)@(mEET@xx@xz))) ⇒ ∀xx: a, xy: a, xz: a: (jOIN@xx@(mEET@xy@(jOIN@xx@xz))) = (mEET@(jOIN@xx@xy)@(jOIN@xx@xz))) thf(cMODULAR_THM_DEF2_pme, conjecture)

SEV003∧5.p TPS problem from LATTICES-THMS
a: $tType thf(a_type, type)
∀jOIN: $a \to a \to a$, mEET: $a \to a \to a$: ((∀xx: a: (jOIN@xx@xx) = xx and ∀xx: a: (mEET@xx@xx) = xx and ∀xx: a, xy: a, xz: a: (jOIN@(jOIN@xx@xy)@xz) = (jOIN@xx@(jOIN@xy@xz)) and ∀xx: a, xy: a, xz: a: (mEET@(mEE (mEET@xx@(mEET@xy@xz)) and ∀xx: a, xy: a: (jOIN@xx@xy) = (jOIN@xy@xx) and ∀xx: a, xy: a: (mEET@xx@xy) = (mEET@xy@xx) and ∀xx: a, xy: a: (jOIN@(mEET@xx@xy)@xy) = xy and ∀xx: a, xy: a: (mEET@(jOIN@xx@xy)@xy) = xy) ⇒ (¬∀xx: a, xy: a, xz: a: (jOIN@xx@(mEET@xy@(jOIN@xx@xz))) = (mEET@(jOIN@xx@xy)@(jOIN@xx@xz)) ⇒ ∃xx: a, xy: a, xa: a, xb: a, xc: a: (xa ≠ xb and xa ≠ xc and xa ≠ xx and xa ≠ xy and xb ≠ xc and xb ≠ xx and xb ≠ xy and xc ≠ xx and xc ≠ xy and xx ≠ xy and (mEET@xx@xy) = xy and (jOIN@xx@xy) = xx and (mEET@xx@xa) = xa and (jOIN@xx@xa) = xx and (mEET@xx@xb) = xb and (jOIN@xx@xb) = xx and (mEET@xx@xc) = xc and (jOIN@xx xx and (mEET@xa@xb) = xy and (jOIN@xa@xb) = xx and (mEET@xa@xc) = xa and (jOIN@xa@xc) = xc and (mEET@x xy and (jOIN@xa@xy) = xa and (mEET@xb@xc) = xy and (jOIN@xb@xc) = xx and (mEET@xb@xy) = xy and (jOIN@xb xb and (mEET@xc@xy) = xy and (jOIN@xc@xy) = xc))) thf(cPENTAGON_THM2C_pme, conjecture)

SEV004∧5.p TPS problem from LATTICES-THMS
a: $tType thf(a_type, type)
∀jOIN: $a \to a \to a$, mEET: $a \to a \to a$: ((∀xx: a: (jOIN@xx@xx) = xx and ∀xx: a: (mEET@xx@xx) = xx and ∀xx: a, xy: a, xz: a: (jOIN@(jOIN@xx@xy)@xz) = (jOIN@xx@(jOIN@xy@xz)) and ∀xx: a, xy: a, xz: a: (mEET@(mEE (mEET@xx@(mEET@xy@xz)) and ∀xx: a, xy: a: (jOIN@xx@xy) = (jOIN@xy@xx) and ∀xx: a, xy: a: (mEET@xx@xy) = (mEET@xy@xx) and ∀xx: a, xy: a: (jOIN@(mEET@xx@xy)@xy) = xy and ∀xx: a, xy: a: (mEET@(jOIN@xx@xy)@xy) = xy) ⇒ (∀xx: a, xy: a, xz: a: (jOIN@xx@(mEET@xy@(jOIN@xx@xz))) = (mEET@(jOIN@xx@xy)@(jOIN@xx@xz)) ⟺ ¬∃xx: a, xy: a, xa: a, xb: a, xc: a: (xa ≠ xb and xa ≠ xc and xa ≠ xx and xa ≠ xy and xb ≠ xc and xb ≠ xx and xb ≠ xy and xc ≠ xx and xc ≠ xy and xx ≠ xy and (mEET@xx@xy) = xy and (jOIN@xx@xy) = xx and (mEET@xx xa and (jOIN@xx@xa) = xx and (mEET@xx@xb) = xb and (jOIN@xx@xb) = xx and (mEET@xx@xc) = xc and (jOIN@xx xx and (mEET@xa@xb) = xy and (jOIN@xa@xb) = xx and (mEET@xa@xc) = xa and (jOIN@xa@xc) = xc and (mEET@x xy and (jOIN@xa@xy) = xa and (mEET@xb@xc) = xy and (jOIN@xb@xc) = xx and (mEET@xb@xy) = xy and (jOIN@xb xb and (mEET@xc@xy) = xy and (jOIN@xc@xy) = xc))) thf(cMODULAR_THM2_DEF2_pme, conjecture)

SEV005∧5.p TPS problem from LATTICES-THMS
a: $tType thf(a_type, type)
∀jOIN: $a \to a \to a$, mEET: $a \to a \to a$: ((∀xx: a: (jOIN@xx@xx) = xx and ∀xx: a: (mEET@xx@xx) = xx and ∀xx: a, xy: a, xz: a: (jOIN@(jOIN@xx@xy)@xz) = (jOIN@xx@(jOIN@xy@xz)) and ∀xx: a, xy: a, xz: a: (mEET@(mEE (mEET@xx@(mEET@xy@xz)) and ∀xx: a, xy: a: (jOIN@xx@xy) = (jOIN@xy@xx) and ∀xx: a, xy: a: (mEET@xx@xy) = (mEET@xy@xx) and ∀xx: a, xy: a: (jOIN@(mEET@xx@xy)@xy) = xy and ∀xx: a, xy: a: (mEET@(jOIN@xx@xy)@xy) = xy) ⇒ (∀xx: a, xy: a, xz: a: ((jOIN@xx@xz) = xz ⇒ (jOIN@xx@(mEET@xy@xz)) = (mEET@(jOIN@xx@xy)@xz)) ⟺ ¬ ∃xx: a, xy: a, xa: a, xb: a, xc: a: (xa ≠ xb and xa ≠ xc and xa ≠ xx and xa ≠ xy and xb ≠ xc and xb ≠ xx and xb ≠ xy and xc ≠ xx and xc ≠ xy and xx ≠ xy and (mEET@xx@xy) = xy and (jOIN@xx@xy) = xx and (mEET@xx xa and (jOIN@xx@xa) = xx and (mEET@xx@xb) = xb and (jOIN@xx@xb) = xx and (mEET@xx@xc) = xc and (jOIN@xx xx and (mEET@xa@xb) = xy and (jOIN@xa@xb) = xx and (mEET@xa@xc) = xa and (jOIN@xa@xc) = xc and (mEET@x xy and (jOIN@xa@xy) = xa and (mEET@xb@xc) = xy and (jOIN@xb@xc) = xx and (mEET@xb@xy) = xy and (jOIN@xb xb and (mEET@xc@xy) = xy and (jOIN@xc@xy) = xc))) thf(cMODULAR_THM2_pme, conjecture)

SEV006∧5.p TPS problem from LATTICES-THMS
a: $tType thf(a_type, type)
∀jOIN: $a \to a \to a$, mEET: $a \to a \to a$: ((∀xx: a: (jOIN@xx@xx) = xx and ∀xx: a: (mEET@xx@xx) = xx and ∀xx: a, xy: a, xz: a: (jOIN@(jOIN@xx@xy)@xz) = (jOIN@xx@(jOIN@xy@xz)) and ∀xx: a, xy: a, xz: a: (mEET@(mEE (mEET@xx@(mEET@xy@xz)) and ∀xx: a, xy: a: (jOIN@xx@xy) = (jOIN@xy@xx) and ∀xx: a, xy: a: (mEET@xx@xy) = (mEET@xy@xx) and ∀xx: a, xy: a: (jOIN@(mEET@xx@xy)@xy) = xy and ∀xx: a, xy: a: (mEET@(jOIN@xx@xy)@xy) = xy and ∃xx: a, xy: a, xa: a, xb: a, xc: a: (xa ≠ xb and xa ≠ xc and xa ≠ xx and xa ≠ xy and xb ≠ xc and xb ≠ xx and xb ≠ xy and xc ≠ xx and xc ≠ xy and xx ≠ xy) and ¬ ∀xx: a, xy: a, xz: a: (jOIN@xx@(mEET@xy@(jOIN@xx@xz))) (mEET@(jOIN@xx@xy)@(jOIN@xx@xz))) ⇒ ∃xx: a, xy: a, xa: a, xb: a, xc: a: ((mEET@xx@xy) = xy and (jOIN@xx@xy) = xx and (mEET@xx@xa) = xa and (jOIN@xx@xa) = xx and (mEET@xx@xb) = xb and (jOIN@xx@xb) = xx and (mEET@x xc and (jOIN@xx@xc) = xx and (mEET@xa@xb) = xy and (jOIN@xa@xb) = xx and (mEET@xa@xc) = xa and (jOIN@xa@ xc and (mEET@xa@xy) = xy and (jOIN@xa@xy) = xa and (mEET@xb@xc) = xy and (jOIN@xb@xc) = xx and (mEET@x xy and (jOIN@xb@xy) = xb and (mEET@xc@xy) = xy and (jOIN@xc@xy) = xc)) thf(cPENTAGON_THM2D_pme, con

SEV008∧5.p TPS problem THM261
A partition defines an equivalence relation.
a: $tType thf(a_type, type)
∀p: ($a \to$ $o) → $o: ((∀xp: $a \to$ $o: (($p$@xp) ⇒ ∃xz: a: (xp@xz)) and ∀xx: a: ∃xp: $a \to$ $o: ($p$@xp and xp@xx and ∀xq: $a \to$ $o: (($p$@xq and xq@xx) ⇒ xq = xp))) ⇒ (∀xx: a: ∃s: $a \to$ $o: ($p$@$s$ and s@xx and s@xx) and ∀xx: a, xy: a: (∃s: $a \to$ $o: ($p$@$s$ and s@xx and s@xy) ⇒ ∃s: $a \to$ $o: ($p$@$s$ and s@xy and s@xx)) and ∀xx: a, xy: a, xz: a: ((∃s: $a \to$ $o: ($p$@$s$ and s@xx and s@xy) and ∃s: $a \to$ $o: ($p$@$s$ and s@xy and s@xz)) ⇒ ∃s: $a \to$ $o: ($p$@$s$ and s@xx and s@xz))))

SEV009∧5.p TPS problem THM261-B
A partition defines an equivalence relation.
a: $tType thf(a_type, type)
∀p: ($a \to$ $o) → $o: (∀xx: a: ∃xp: $a \to$ $o: ($p$@xp and xp@xx and ∀xq: $a \to$ $o: (($p$@xq and xq@xx) ⇒ xq = xp)) ⇒ (∀xx: a: ∃s: $a \to$ $o: ($p$@$s$ and s@xx and s@xx) and ∀xx: a, xy: a: (∃s: $a \to$ $o: ($p$@$s$ and s@xx and s@xy) ⇒ ∃s: $a \to$ $o: ($p$@$s$ and s@xy and s@xx)) and ∀xx: a, xy: a, xz: a: ((∃s: $a \to$ $o: ($p$@$s$ and s@xx and s@xy) and ∃s: $a \to$ $o: ($p$@$s$ and s@xy and s@xz)) ⇒ ∃s: $a \to$ $o: ($p$@$s$ and s@xx and s@xz)))) thf(cTHM261_B_pme, conjecture)

SEV010∧5.p TPS problem THM260
An equivalence relation defines a partition.
a: $tType thf(a_type, type)
∀r: $a \to a \to$ $o: ((∀xx: a: (r@xx@xx) and ∀xx: a, xy: a: ((r@xx@xy) ⇒ (r@xy@xx)) and ∀xx: a, xy: a, xz: a: ((r@xx@xy and (r@xx@xz))) ⇒ (∀xp: $a \to$ $o: ((∃xz: a: (xp@xz) and ∀xx: a: ((xp@xx) ⇒ ∀xy: a: ((xp@xy) ⟺ (r@xx@xy)))) ⇒ ∃xz: a: (xp@xz)) and ∀xx: a: ∃xp: $a \to$ $o: (∃xz: a: (xp@xz) and ∀xx_0: a: ((xp@xx_0) ⇒ ∀xy: a: ((xp@xy) ⟺ (r@xx_0@xy))) and xp@xx and ∀xq: $a \to$ $o: ((∃xz: a: (xq@xz) and ∀xx_0: a: ((xq@xx_0) ⇒ ∀xy: a: ((xq@xy) ⟺ (r@xx_0@xy))) and xq@xx) ⇒ xq = xp)))) thf(cTHM260_pme, conjecture)

SEV011∧5.p TPS problem THM260-B
An equivalence relation defines a partition.
a: $tType thf(a_type, type)
∀r: $a \to a \to$ $o: ((∀xx: a: (r@xx@xx) and ∀xx: a, xy: a: ((r@xx@xy) ⇒ (r@xy@xx)) and ∀xx: a, xy: a, xz: a: ((r@xx@xy and (r@xx@xz))) ⇒ ∀xx: a: ∃xp: $a \to$ $o: (∀$xx_0$: a: ((xp@xx_0) ⇒ ∀xy: a: ((xp@xy) ⟺ (r@xx_0@xy))) and xp@xx and ∀xq: a $o: ((∀$xx_0$: a: ((xq@xx_0) ⇒ ∀xy: a: ((xq@xy) ⟺ (r@xx_0@xy))) and xq@xx) ⇒ xq = xp))) thf(cTHM260_B_pme, con

SEV012∧5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
∀xx: $o, xy: $o: ($true ⇒ $true) and ∀xx: $o, xy: $o, xz: $o: (($true and $true) ⇒ $true) and (λxx: $o, xy: $o: $true) = (λxx: $o, xy: $o: $true) thf(cTHM519_pme, conjecture)

SEV013^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall xx\colon a.\ xx = xx$ and $\forall xx\colon a, xy\colon a.\ (xx = xy \Rightarrow xy = xx)$ and $\forall xx\colon a, xy\colon a, xz\colon a.\ ((xx = xy \text{ and } xy = xz) \Rightarrow xx = xz)$ thf(cTHM511_pme, conjecture)

SEV014^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall xr\colon a \to a \to o.\ ((\forall xx\colon a.\ (xr@xx@xx) \text{ and } \forall xx\colon a, xy\colon a.\ ((xr@xx@xy) \Rightarrow (xr@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a.\ ((xr@xx@xy \text{ and } xr@xy@xz) \Rightarrow (xr@xx@xz))) \Rightarrow \forall xx\colon a.\ (xr@xx@xx))$ thf(cTHM513_pme, conjecture)

SEV015^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall xp\colon a \to a \to o.\ ((\forall xx\colon a, xy\colon a.\ ((xp@xx@xy) \Rightarrow (xp@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a.\ ((xp@xx@xy \text{ and } xp@xy@xz) \Rightarrow (xp@xx@xz)) \text{ and } xp = xp) \Rightarrow \forall xx\colon a, xy\colon a.\ ((xp@xx@xy) \Rightarrow (xp@xx@xx)))$ thf(cTHM520_pme, conjecture)

SEV016^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall p\colon (a \to o) \to o.\ ((\forall xp\colon a \to o.\ ((p@xp) \Rightarrow \exists xz\colon a.\ (xp@xz)) \text{ and } \forall xx\colon a.\ \exists xp\colon a \to o.\ (p@xp \text{ and } xp@xx \text{ and } \forall xq\colon a \to o.\ ((p@xq \text{ and } xq@xx) \Rightarrow xq = xp))) \Rightarrow \exists q\colon a \to a \to o.\ (\lambda xs\colon a \to o.\ \exists xz\colon a.\ xs = (\lambda xx\colon a.\ (q@xx@xz))) = p)$ thf(cTHM262_NEW_pme, conjecture)

SEV017^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall xr\colon a \to a \to o.\ ((\forall xx\colon a.\ (xr@xx@xx) \text{ and } \forall xx\colon a, xy\colon a.\ ((xr@xx@xy) \Rightarrow (xr@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a.\ ((xr@xx@xy \text{ and } xr@xy@xz) \Rightarrow (xr@xx@xz))) \Rightarrow \forall xx\colon a, xy\colon a, xz\colon a.\ ((xr@xx@xy) \Rightarrow ((xr@xy@xz) \Rightarrow (xr@xx@xz))))$ thf(cTHM514_pme, conjecture)

SEV018^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall p\colon (a \to o) \to o.\ ((\forall xp\colon a \to o.\ ((p@xp) \Rightarrow \exists xz\colon a.\ (xp@xz)) \text{ and } \forall xx\colon a.\ \exists xp\colon a \to o.\ (p@xp \text{ and } xp@xx \text{ and } \forall xq\colon a \to o.\ ((p@xq \text{ and } xq@xx) \Rightarrow xq = xp))) \Rightarrow \exists q\colon a \to a \to o.\ (\lambda xs\colon a \to o.\ (\exists xz\colon a.\ (xs@xz) \text{ and } \forall xx\colon a.\ ((xs@xx) \Rightarrow \forall xy\colon a.\ ((xs@xy) \iff (q@xx@xy))))) = p)$ thf(cTHM262A_pme, conjecture)

SEV019^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$cQ\colon a \to a \to o$ thf(cQ, type)
$\forall xx\colon a.\ \exists xp\colon a \to o.\ (\exists xz\colon a.\ (xp@xz) \text{ and } \forall xx_0\colon a.\ ((xp@xx_0) \Rightarrow \forall xy\colon a.\ ((xp@xy) \iff (cQ@xx_0@xy))) \text{ and } xp@xx) \Rightarrow (\forall xx\colon a.\ (cQ@xx@xx) \text{ and } \forall xx\colon a, xy\colon a.\ ((cQ@xx@xy) \Rightarrow (cQ@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a.\ ((cQ@xx@xy \text{ and } cQ@xy@xz) \Rightarrow (cQ@xx@xz)))$ thf(cTHM559_pme, conjecture)

SEV020^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall p\colon (a \to o) \to o.\ (\forall xx\colon a.\ \exists xp\colon a \to o.\ (p@xp \text{ and } xp@xx \text{ and } \forall xq\colon a \to o.\ ((p@xq \text{ and } xq@xx) \Rightarrow xq = xp)) \Rightarrow \exists q\colon a \to a \to o.\ (\forall xx\colon a.\ (q@xx@xx) \text{ and } \forall xx\colon a, xy\colon a.\ ((q@xx@xy) \Rightarrow (q@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a.\ ((q@xx@xy \text{ and } q@xy@xz) \Rightarrow (q@xx@xz)) \text{ and } (\lambda xs\colon a \to o.\ \forall xx\colon a.\ ((xs@xx) \Rightarrow \forall xy\colon a.\ ((xs@xy) \iff (q@xx@xy)))) = p))$ thf(cTHM262_B_pme, co

SEV021^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$cP\colon (a \to o) \to o$ thf(cP, type)
$\forall xq_1\colon a \to o, xq_2\colon a \to o.\ ((xq_1 = xq_2 \text{ and } cP@xq_1) \Rightarrow (cP@xq_2)) \Rightarrow ((\forall xp\colon a \to o.\ ((cP@xp) \Rightarrow \exists xz\colon a.\ (xp@xz)) \text{ and } \forall xx\colon a.\ \exists xp\colon a \to o.\ (cP@xp \text{ and } xp@xx) \text{ and } \forall xx\colon a, xy\colon a, xp\colon a \to o, xq\colon a \to o.\ ((cP@xp \text{ and } cP@xq \text{ and } (xq@xy))) \Rightarrow \exists q\colon a \to a \to o.\ (\lambda xs\colon a \to o.\ (\exists xz\colon a.\ (xs@xz) \text{ and } \forall xx\colon a.\ ((xs@xx) \Rightarrow \forall xy\colon a.\ ((xs@xy) \iff (q@xx@xy))))) = cP)$ thf(cTHM262_D_EXT2_pme, conjecture)

SEV021^6.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$cP\colon (a \to o) \to o$ thf(cP, type)
$cQ\colon a \to a \to o$ thf(cQ, type)
$cQ = (\lambda x\colon a, y\colon a.\ \exists s\colon a \to o.\ (cP@s \text{ and } s@x \text{ and } s@y))$ thf(cQ_def, definition)
$\forall xq_1\colon a \to o, xq_2\colon a \to o.\ ((xq_1 = xq_2 \text{ and } cP@xq_1) \Rightarrow (cP@xq_2)) \Rightarrow ((\forall xp\colon a \to o.\ ((cP@xp) \Rightarrow \exists xz\colon a.\ (xp@xz)) \text{ and } \forall xx\colon a.\ \exists xp\colon a \to o.\ (cP@xp \text{ and } xp@xx) \text{ and } \forall xx\colon a, xy\colon a, xp\colon a \to o, xq\colon a \to o.\ ((cP@xp \text{ and } cP@xq \text{ and } (xq@xy))) \Rightarrow (\lambda xs\colon a \to o.\ (\exists xz\colon a.\ (xs@xz) \text{ and } \forall xx\colon a.\ ((xs@xx) \Rightarrow \forall xy\colon a.\ ((xs@xy) \iff (cQ@xx@xy))))) = cP)$ thf(cTHM262_D_EXT2_pme, conjecture)

SEV021^7.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)

cP: $(a \to \$o) \to \$o$ thf(cP, type)
cQ: $a \to a \to \$o$ thf(cQ, type)
cQ = $(\lambda x\colon a, y\colon a\colon \forall s\colon a \to \$o\colon ((cP@s) \Rightarrow ((s@x) \iff (s@y))))$ thf(cQ_def, definition)
$\forall xq_1\colon a \to \$o, xq_2\colon a \to \$o\colon ((xq_1 = xq_2 \text{ and } cP@xq_1) \Rightarrow (cP@xq_2)) \Rightarrow ((\forall xp\colon a \to \$o\colon ((cP@xp) \Rightarrow$
$\exists xz\colon a\colon (xp@xz)) \text{ and } \forall xx\colon a\colon \exists xp\colon a \to \$o\colon (cP@xp \text{ and } xp@xx) \text{ and } \forall xx\colon a, xy\colon a, xp\colon a \to \$o, xq\colon a \to \$o\colon ((cP@xp \text{ and } cP@x$
$(xq@xy))) \Rightarrow (\lambda xs\colon a \to \$o\colon (\exists xz\colon a\colon (xs@xz) \text{ and } \forall xx\colon a\colon ((xs@xx) \Rightarrow \forall xy\colon a\colon ((xs@xy) \iff (cQ@xx@xy))))) =$
cP) thf(cTHM262_D_EXT2_pme, conjecture)

SEV022^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
cP: $(a \to \$o) \to \$o$ thf(cP, type)
$(\forall xp\colon a \to \$o\colon ((cP@xp) \Rightarrow \exists xz\colon a\colon (xp@xz)) \text{ and } \forall xx\colon a, xp\colon a \to \$o, xq\colon a \to \$o\colon ((cP@xp \text{ and } cP@xq \text{ and } xp@xx \text{ and } xq@x$
$xp = xq)) \Rightarrow \exists r\colon a \to a \to \$o\colon (\forall xx\colon a, xy\colon a\colon ((r@xx@xy) \Rightarrow (r@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a\colon ((r@xx@xy \text{ and } r@xy@xz$
$(r@xx@xz)) \text{ and } (\lambda xs\colon a \to \$o\colon (\exists xz\colon a\colon (xs@xz) \text{ and } \forall xx\colon a\colon ((xs@xx) \Rightarrow \forall xy\colon a\colon ((xs@xy) \iff (r@xx@xy))))) =$
cP) thf(cTHM556_pme, conjecture)

SEV023^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall xp\colon a \to \$o, xa\colon a \to \$o\colon (\forall xb\colon a\colon (xp@xb) = (xa@xb) \Rightarrow \forall p\colon (a \to \$o) \to \$o\colon ((p@xp) \Rightarrow (p@xa))) \Rightarrow \forall p\colon (a \to$
$\$o) \to \$o\colon ((\forall xp\colon a \to \$o\colon ((p@xp) \Rightarrow \exists xz\colon a\colon (xp@xz)) \text{ and } \forall xx\colon a\colon \exists xp\colon a \to \$o\colon (p@xp \text{ and } xp@xx) \text{ and } \forall xx\colon a, xy\colon a, xp\colon a \to$
$\$o, xq\colon a \to \$o\colon ((p@xp \text{ and } p@xq \text{ and } xp@xx \text{ and } xq@xx \text{ and } xp@xy) \Rightarrow (xq@xy))) \Rightarrow \exists q\colon a \to a \to \$o\colon (\lambda xs\colon a \to$
$\$o\colon (\exists xz\colon a\colon (xs@xz) \text{ and } \forall xx\colon a\colon ((xs@xx) \Rightarrow \forall xy\colon a\colon ((xs@xy) \iff (q@xx@xy))))) = p)$ thf(cTHM262_D_EXT_pme, co

SEV024^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall p\colon (a \to \$o) \to \$o\colon ((\forall xp\colon a \to \$o\colon ((p@xp) \Rightarrow \exists xz\colon a\colon (xp@xz)) \text{ and } \forall xx\colon a\colon \exists xp\colon a \to \$o\colon (p@xp \text{ and } xp@xx \text{ and } \forall xq\colon a \to$
$\$o\colon ((p@xq \text{ and } xq@xx) \Rightarrow xq = xp))) \Rightarrow \exists q\colon a \to a \to \$o\colon (\forall xx\colon a\colon (q@xx@xx) \text{ and } \forall xx\colon a, xy\colon a\colon ((q@xx@xy) \Rightarrow$
$(q@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a\colon ((q@xx@xy \text{ and } q@xy@xz) \Rightarrow (q@xx@xz)) \text{ and } (\lambda xs\colon a \to \$o\colon (\exists xz\colon a\colon (xs@xz) \text{ and } \forall xx\colon$
$\forall xy\colon a\colon ((xs@xy) \iff (q@xx@xy))))) = p))$ thf(cTHM262_pme, conjecture)

SEV025^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
cP: $(a \to \$o) \to \$o$ thf(cP, type)
$\forall xq_1\colon a \to \$o, xq_2\colon a \to \$o\colon ((xq_1 = xq_2 \text{ and } cP@xq_1) \Rightarrow (cP@xq_2)) \Rightarrow ((\forall xp\colon a \to \$o\colon ((cP@xp) \Rightarrow$
$\exists xz\colon a\colon (xp@xz)) \text{ and } \forall xx\colon a\colon \exists xp\colon a \to \$o\colon (cP@xp \text{ and } xp@xx \text{ and } \forall xq\colon a \to \$o\colon ((cP@xq \text{ and } xq@xx) \Rightarrow xq =$
$xp))) \Rightarrow \exists q\colon a \to a \to \$o\colon (\forall xx\colon a\colon (q@xx@xx) \text{ and } \forall xx\colon a, xy\colon a\colon ((q@xx@xy) \Rightarrow (q@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a\colon ((q@x$
$(q@xx@xz)) \text{ and } (\lambda xs\colon a \to \$o\colon (\exists xz\colon a\colon (xs@xz) \text{ and } \forall xx\colon a\colon ((xs@xx) \Rightarrow \forall xy\colon a\colon ((xs@xy) \iff (q@xx@xy))))) =$
cP)) thf(cTHM262_EXT2_pme, conjecture)

SEV026^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
$\forall xr\colon \$i \to \$i \to \$o\colon \exists xs\colon \$i \to \$i \to \$o\colon (\forall xa\colon \$i, xb\colon \$i\colon ((xr@xa@xb) \Rightarrow (xs@xa@xb)) \text{ and } \forall xx\colon \$i\colon (xs@xx@xx) \text{ and } \forall xx\colon \$i, xy$
$(xs@xy@xx)) \text{ and } \forall xx\colon \$i, xy\colon \$i, xz\colon \$i\colon ((xs@xx@xy \text{ and } xs@xy@xz) \Rightarrow (xs@xx@xz)) \text{ and } \forall xt\colon \$i \to \$i \to \$o\colon ((\forall xa\colon \$i, xb\colon \$i$
$(xt@xa@xb)) \text{ and } \forall xx\colon \$i\colon (xt@xx@xx) \text{ and } \forall xx\colon \$i, xy\colon \$i\colon ((xt@xx@xy) \Rightarrow (xt@xy@xx)) \text{ and } \forall xx\colon \$i, xy\colon \$i, xz\colon \$i\colon ((xt@xx@$
$(xt@xx@xz))) \Rightarrow \forall xa\colon \$i, xb\colon \$i\colon ((xs@xa@xb) \Rightarrow (xt@xa@xb))))$ thf(cTHM601_pme, conjecture)

SEV027^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
$\forall xp\colon a \to \$o, xa\colon a \to \$o\colon (\forall xb\colon a\colon (xp@xb) = (xa@xb) \Rightarrow \forall p\colon (a \to \$o) \to \$o\colon ((p@xp) \Rightarrow (p@xa))) \Rightarrow \forall p\colon (a \to$
$\$o) \to \$o\colon ((\forall xp\colon a \to \$o\colon ((p@xp) \Rightarrow \exists xz\colon a\colon (xp@xz)) \text{ and } \forall xx\colon a\colon \exists xp\colon a \to \$o\colon (p@xp \text{ and } xp@xx \text{ and } \forall xq\colon a \to$
$\$o\colon ((p@xq \text{ and } xq@xx) \Rightarrow xq = xp))) \Rightarrow \exists q\colon a \to a \to \$o\colon (\forall xx\colon a\colon (q@xx@xx) \text{ and } \forall xx\colon a, xy\colon a\colon ((q@xx@xy) \Rightarrow$
$(q@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a\colon ((q@xx@xy \text{ and } q@xy@xz) \Rightarrow (q@xx@xz)) \text{ and } (\lambda xs\colon a \to \$o\colon (\exists xz\colon a\colon (xs@xz) \text{ and } \forall xx\colon$
$\forall xy\colon a\colon ((xs@xy) \iff (q@xx@xy))))) = p))$ thf(cTHM262_EXT_pme, conjecture)

SEV028^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)
cQ: $a \to a \to \$o$ thf(cQ, type)
$(\forall xp\colon a \to \$o\colon ((\exists xz\colon a\colon (xp@xz) \text{ and } \forall xx\colon a\colon ((xp@xx) \Rightarrow \forall xy\colon a\colon ((xp@xy) \iff (cQ@xx@xy)))) \Rightarrow$
$\exists xz\colon a\colon (xp@xz)) \text{ and } \forall xx\colon a\colon \exists xp\colon a \to \$o\colon (\exists xz\colon a\colon (xp@xz) \text{ and } \forall xx_0\colon a\colon ((xp@xx_0) \Rightarrow \forall xy\colon a\colon ((xp@xy) \iff$
$(cQ@xx_0@xy))) \text{ and } xp@xx \text{ and } \forall xq\colon a \to \$o\colon ((\exists xz\colon a\colon (xq@xz) \text{ and } \forall xx_0\colon a\colon ((xq@xx_0) \Rightarrow \forall xy\colon a\colon ((xq@xy) \iff$
$(cQ@xx_0@xy))) \text{ and } xq@xx) \Rightarrow xq = xp))) \Rightarrow (\forall xx\colon a\colon (cQ@xx@xx) \text{ and } \forall xx\colon a, xy\colon a\colon ((cQ@xx@xy) \Rightarrow$
$(cQ@xy@xx)) \text{ and } \forall xx\colon a, xy\colon a, xz\colon a\colon ((cQ@xx@xy \text{ and } cQ@xy@xz) \Rightarrow (cQ@xx@xz)))$ thf(cTHM558_pme, conjecture)

SEV029^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: $tType thf(a_type, type)

$\forall$xr: $a \to a \to$ \$o, xs: $a \to$ \$o: (($\forall$xx: a: ((xs@xx) $\Rightarrow$ (xr@xx@xx)) and $\forall$xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$ (xr@xy@xx)) and $\forall$xx: a, xy: a, xz: a: ((xr@xx@xy and xr@xy@xz) $\Rightarrow$ (xr@xx@xz))) $\Rightarrow$ ($\forall$xa: $a \to$ \$o: ($\exists$xx: a: $\forall$xx$_1$: a: ((xa (xr@xx@xx$_1$)) $\Rightarrow$ $\exists$xx: a: (xa@xx)) and $\forall$xx: a: ((xs@xx) $\iff$ $\exists s$: $a \to$ \$o: ($\exists$xx$_0$: a: $\forall$xx$_2$: a: ((s@xx$_2$) $\iff$ (xr@xx$_0$@xx$_2$)) and s@xx)) and $\forall$xb: $a \to$ \$o, xc: $a \to$ \$o: (($\exists$xx: a: $\forall$xx$_3$: a: ((xb@xx$_3$) $\iff$ (xr@xx@xx$_3$)) and $\exists$xx: a: $\forall$xx$_4$ (xr@xx@xx$_4$)) and $\exists$xx: a: (xb@xx and xc@xx)) $\Rightarrow$ xb = xc))) thf(cTHM260A_pme, conjecture)

SEV030^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
cP: ($a \to$ \$o) $\to$ \$o thf(cP, type)
$\forall$xq$_1$: $a \to$ \$o, xq$_2$: $a \to$ \$o: ((xq$_1$ = xq$_2$ and cP@xq$_1$) $\Rightarrow$ (cP@xq$_2$)) $\Rightarrow$ (($\forall$xp: $a \to$ \$o: ((cP@xp) $\Rightarrow$ $\exists$xz: a: (xp@xz)) and $\forall$xx: a: $\exists$xp: $a \to$ \$o: (cP@xp and xp@xx) and $\forall$xx: a, xy: a, xp: $a \to$ \$o, xq: $a \to$ \$o: ((cP@xp and cP@x (xq@xy))) $\Rightarrow$ $\exists q$: $a \to a \to$ \$o: ($\forall$xx: a: (q@xx@xx) and $\forall$xx: a, xy: a: ((q@xx@xy) $\Rightarrow$ (q@xy@xx)) and $\forall$xx: a, xy: a, xz: a: (((q@xx@xz)) and (λxs: $a \to$ \$o: ($\exists$xz: a: (xs@xz) and $\forall$xx: a: ((xs@xx) $\Rightarrow$ $\forall$xy: a: ((xs@xy) $\iff$ (q@xx@xy))))) = cP)) thf(cTHM262_C_EXT2_pme, conjecture)

SEV031^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
b: \$tType thf(b_type, type)
$\forall$xp: $a \to$ \$o, xe: $a \to (a \to b) \to (a \to b) \to$ \$o: ($\forall$xx: a: ((xp@xx) $\Rightarrow$ ($\forall$xx$_0$: $a \to b$: (xe@xx@xx$_0$@xx$_0$) and $\forall$xx$_0$: $a \to$ b, xy: $a \to b$: ((xe@xx@xx$_0$@xy) $\Rightarrow$ (xe@xx@xy@xx$_0$)) and $\forall$xx$_0$: $a \to b$, xy: $a \to b$, xz: $a \to b$: ((xe@xx@xx$_0$@xy and xe@xx@ (xe@xx@xx$_0$@xz)))) $\Rightarrow$ ($\forall$xx: $a \to b$, xx$_0$: a: ((xp@xx$_0$) $\Rightarrow$ (xe@xx$_0$@xx@xx)) and $\forall$xx: $a \to b$, xy: $a \to$ b: ($\forall$xx$_0$: a: ((xp@xx$_0$) $\Rightarrow$ (xe@xx$_0$@xx@xy)) $\Rightarrow$ $\forall$xx$_0$: a: ((xp@xx$_0$) $\Rightarrow$ (xe@xx$_0$@xy@xx))) and $\forall$xx: $a \to$ b, xy: $a \to b$, xz: $a \to b$: (($\forall$xx$_0$: a: ((xp@xx$_0$) $\Rightarrow$ (xe@xx$_0$@xx@xy)) and $\forall$xx$_0$: a: ((xp@xx$_0$) $\Rightarrow$ (xe@xx$_0$@xy@xz))) $\Rightarrow$ $\forall$xx$_0$: a: ((xp@xx$_0$) $\Rightarrow$ (xe@xx$_0$@xx@xz))))) thf(cTHM512_pme, conjecture)

SEV032^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
$\forall t$: ($a \to$ \$o) $\to$ \$o, u: ($a \to$ \$o) $\to$ \$o: (($t \neq u$ and $\forall$xp: $a \to$ \$o: ((t@xp) $\Rightarrow$ $\exists$xz: a: (xp@xz)) and $\forall$xx: a: $\exists$xp: $a \to$ \$o: (t@xp and xp@xx and $\forall$xq: $a \to$ \$o: ((t@xq and xq@xx) $\Rightarrow$ xq = xp)) and $\forall$xp: $a \to$ \$o: ((u@xp) $\Rightarrow$ $\exists$xz: a: (xp@xz)) and $\forall$xx: a: $\exists$xp: $a \to$ \$o: (u@xp and xp@xx and $\forall$xq: $a \to$ \$o: ((u@xq and xq@xx) $\Rightarrow$ xq = xp))) $\Rightarrow$ $\exists$xx: a, xy: a: (($\exists$xs: $a \to$ \$o: (t@xs and xs@xx and xs@xy) and $\forall$xq: $a \to$ \$o: ((u@xq) $\Rightarrow$ ($\neg$ xq@xx or $\neg$ xq@xy))) \$o: (u@xs and xs@xx and xs@xy) and $\forall$xq: $a \to$ \$o: ((t@xq) $\Rightarrow$ ($\neg$ xq@xx or $\neg$ xq@xy))))) thf(cTHM266_LEMMA_pme,

SEV033^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
$\forall$xp: $a \to$ \$o, xa: $a \to$ \$o: ($\forall$xb: a: (xp@xb) = (xa@xb) $\Rightarrow$ $\forall p$: ($a \to$ \$o) $\to$ \$o: ((p@xp) $\Rightarrow$ (p@xa))) $\Rightarrow$ $\forall p$: ($a \to$ \$o) $\to$ \$o: (($\forall$xp: $a \to$ \$o: ((p@xp) $\Rightarrow$ $\exists$xz: a: (xp@xz)) and $\forall$xx: a: $\exists$xp: $a \to$ \$o: (p@xp and xp@xx) and $\forall$xx: a, xy: a, xp: a \$o, xq: $a \to$ \$o: ((p@xp and p@xq and xp@xx and xq@xx and xp@xy) $\Rightarrow$ (xq@xy))) $\Rightarrow$ $\exists q$: $a \to a \to$ \$o: ($\forall$xx: a: (q@xx@xx ((q@xy@xx)) and $\forall$xx: a, xy: a, xz: a: ((q@xx@xy and q@xy@xz) $\Rightarrow$ (q@xx@xz)) and (λxs: $a \to$ \$o: ($\exists$xz: a: (xs@xz) and $\forall$xx: $\forall$xy: a: ((xs@xy) $\iff$ (q@xx@xy))))) = p)) thf(cTHM262_C_EXT_pme, conjecture)

SEV034^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
b: \$tType thf(b_type, type)
$\forall$xp: $a \to a \to$ \$o, xq: $a \to b \to b \to$ \$o, xf: $a \to b$, xg: $a \to b$: ($\forall$xx: a: ((xp@xx@xx) $\Rightarrow$ (xq@xx@(xf@xx)@(xg@xx))) $\Rightarrow$ ($\forall$xx: a, xy: a: ((xp@xx@xy) $\Rightarrow$ (xq@xx@(xf@xx)@(xf@xy))) $\Rightarrow$ (($\forall$xx: a, xy: a: ((xp@xx@xy) $\Rightarrow$ (xp@xy@xx)) and $\forall$xx: a, (xp@xx@xz)) and xp = xp) $\Rightarrow$ ($\forall$xx: a, xy: a: ((xp@xx@xy) $\Rightarrow$ ($\forall$xx$_0$: b, xy$_0$: b: ((xq@xx@xx$_0$@xy$_0$) $\Rightarrow$ (xq@xx@xy$_0$@xx$_0$)) and $\forall$xx$_0$: b, xy$_0$: b, xz: b: ((xq@xx@xx$_0$@xy$_0$ and xq@xx@xy$_0$@xz) $\Rightarrow$ (xq@xx@xx$_0$@xz)) and (xq@xx) = (xq@xy))) $\Rightarrow$ $\forall$xx: a, xy: a: ((xp@xx@xy) $\Rightarrow$ (xq@xx@(xf@xx)@(xg@xy))))))) thf(cTHM518_pme, conjecture)

SEV035^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
$\forall$xx: $a \to$ \$o: $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xx@(xs@xx$_0$))) and $\forall$xy: a: ((xx@xy) $\Rightarrow$ $\exists$xy$_{20}$: a: (λxx$_0$: a: (xx@xx$_0$ and (xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{20}$))) and $\forall$xx: $a \to$ \$o, xy: $a \to$ \$o: ($\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xy@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xy@xy$_0$) $\Rightarrow$ $\exists$xy$_{21}$: a: (λxx$_0$: a: (xx@xx$_0$ and xy$_0$ = (xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{21}$))) $\Rightarrow$ $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xy@xx$_0$) $\Rightarrow$ (xx@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xx@xy$_0$) $\Rightarrow$ $\exists$xy$_{22}$: a: (λxx$_0$: a: (xy@xx$_0$ (xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{22}$)))) and $\forall$xx: $a \to$ \$o, xy: $a \to$ \$o, xz: $a \to$ \$o: (($\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xy@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xy@xy$_0$) $\Rightarrow$ $\exists$xy$_{23}$: a: (λxx$_0$: a: (xx@xx$_0$ and xy$_0$ = (xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{23}$))) and $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xy@xx$_0$) $\Rightarrow$ (xz@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xz@xy$_0$) $\Rightarrow$ $\exists$xy$_{24}$: a: (λxx$_0$: a: (xy@xx$_0$ (xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{24}$)))) $\Rightarrow$ $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xz@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xz@xy $\exists$xy$_{25}$: a: (λxx$_0$: a: (xx@xx$_0$ and xy$_0$ = (xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{25}$)))) thf(cEQP1_1_pme, conjecture)

SEV037^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS

a: \$tType thf(a_type, type)
b: \$tType thf(b_type, type)
$\forall xp{:}\ a \to a \to \$o, xq{:}\ a \to a \to \$o, xr{:}\ a \to b \to b \to \$o:\ ((\forall xx{:}\ a, xy{:}\ a{:}\ ((xp@xx@xy) \Rightarrow (xp@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a$
$(xp@xx@xz)) \text{ and } xp = xq) \Rightarrow (\forall xx{:}\ a, xy{:}\ a{:}\ ((xp@xx@xy) \Rightarrow (\forall xx_0{:}\ b, xy_0{:}\ b{:}\ ((xr@xx@xx_0@xy_0) \Rightarrow$
$(xr@xx@xy_0@xx_0)) \text{ and } \forall xx_0{:}\ b, xy_0{:}\ b, xz{:}\ b{:}\ ((xr@xx@xx_0@xy_0 \text{ and } xr@xx@xy_0@xz) \Rightarrow (xr@xx@xx_0@xz)) \text{ and } (xr@xx) =$
$(xr@xy))) \Rightarrow (\forall xx{:}\ a \to b, xy{:}\ a \to b{:}\ (\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow (xr@xx_0@(xx@xx_0)@(xy@xy_0))) \Rightarrow$
$\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow (xr@xx_0@(xy@xx_0)@(xx@xy_0)))) \text{ and } \forall xx{:}\ a \to b, xy{:}\ a \to b, xz{:}\ a \to$
$b{:}\ ((\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow (xr@xx_0@(xx@xx_0)@(xy@xy_0))) \text{ and } \forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow$
$(xr@xx_0@(xy@xx_0)@(xz@xy_0)))) \Rightarrow \forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow (xr@xx_0@(xx@xx_0)@(xz@xy_0)))) \text{ and } (\lambda xf{:}\ a \to$
$b, xg{:}\ a \to b{:}\ \forall xx{:}\ a, xy{:}\ a{:}\ ((xp@xx@xy) \Rightarrow (xr@xx@(xf@xx)@(xg@xy)))) = (\lambda xf{:}\ a \to b, xg{:}\ a \to b{:}\ \forall xx{:}\ a, xy{:}\ a{:}\ ((xq@xx@x$
$(xr@xx@(xf@xx)@(xg@xy)))))))$ thf(cTHM516_pme, conjecture)

SEV038^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
$\exists f{:}\ ((a \to \$o) \to \$o) \to a \to a \to \$o:\ (\forall p{:}\ (a \to \$o) \to \$o:\ ((\forall xp{:}\ a \to \$o:\ ((p@xp) \Rightarrow \exists xz{:}\ a{:}\ (xp@xz)) \text{ and } \forall xx{:}\ a{:}\ \exists xp{:}\ a \to$
$\$o:\ (p@xp \text{ and } xp@xx \text{ and } \forall xq{:}\ a \to \$o:\ ((p@xq \text{ and } xq@xx) \Rightarrow xq = xp))) \Rightarrow (\forall xx{:}\ a{:}\ (f@p@xx@xx) \text{ and } \forall xx{:}\ a, xy{:}\ a{:}\ ((f$
$(f@p@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((f@p@xx@xy \text{ and } f@p@xy@xz) \Rightarrow (f@p@xx@xz)))) \text{ and } \forall r{:}\ a \to a \to$
$\$o:\ ((\forall xx{:}\ a{:}\ (r@xx@xx) \text{ and } \forall xx{:}\ a, xy{:}\ a{:}\ ((r@xx@xy) \Rightarrow (r@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((r@xx@xy \text{ and } r@xy@xz) =$
$(r@xx@xz))) \Rightarrow \exists p{:}\ (a \to \$o) \to \$o:\ (\forall xp{:}\ a \to \$o:\ ((p@xp) \Rightarrow \exists xz{:}\ a{:}\ (xp@xz)) \text{ and } \forall xx{:}\ a{:}\ \exists xp{:}\ a \to$
$\$o:\ (p@xp \text{ and } xp@xx \text{ and } \forall xq{:}\ a \to \$o:\ ((p@xq \text{ and } xq@xx) \Rightarrow xq = xp)) \text{ and } r = (f@p))) \text{ and } \forall t{:}\ (a \to$
$\$o) \to \$o, u{:}\ (a \to \$o) \to \$o:\ ((t \neq u \text{ and } \forall xp{:}\ a \to \$o:\ ((t@xp) \Rightarrow \exists xz{:}\ a{:}\ (xp@xz)) \text{ and } \forall xx{:}\ a{:}\ \exists xp{:}\ a \to$
$\$o:\ (t@xp \text{ and } xp@xx \text{ and } \forall xq{:}\ a \to \$o:\ ((t@xq \text{ and } xq@xx) \Rightarrow xq = xp)) \text{ and } \forall xp{:}\ a \to \$o:\ ((u@xp) \Rightarrow$
$\exists xz{:}\ a{:}\ (xp@xz)) \text{ and } \forall xx{:}\ a{:}\ \exists xp{:}\ a \to \$o:\ (u@xp \text{ and } xp@xx \text{ and } \forall xq{:}\ a \to \$o:\ ((u@xq \text{ and } xq@xx) \Rightarrow xq =$
$xp))) \Rightarrow (f@t) \neq (f@u)))$ thf(cTHM266_pme, conjecture)

SEV039^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
$\exists f{:}\ (a \to a \to \$o) \to (a \to \$o) \to \$o:\ (\forall r{:}\ a \to a \to \$o:\ ((\forall xx{:}\ a{:}\ (r@xx@xx) \text{ and } \forall xx{:}\ a, xy{:}\ a{:}\ ((r@xx@xy) \Rightarrow$
$(r@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((r@xx@xy \text{ and } r@xy@xz) \Rightarrow (r@xx@xz))) \Rightarrow (\forall xp{:}\ a \to \$o:\ ((f@r@xp) \Rightarrow$
$\exists xz{:}\ a{:}\ (xp@xz)) \text{ and } \forall xx{:}\ a{:}\ \exists xp{:}\ a \to \$o:\ (f@r@xp \text{ and } xp@xx \text{ and } \forall xq{:}\ a \to \$o:\ ((f@r@xq \text{ and } xq@xx) \Rightarrow$
$xq = xp)))) \text{ and } \forall p{:}\ (a \to \$o) \to \$o:\ ((\forall xp{:}\ a \to \$o:\ ((p@xp) \Rightarrow \exists xz{:}\ a{:}\ (xp@xz)) \text{ and } \forall xx{:}\ a{:}\ \exists xp{:}\ a \to$
$\$o:\ (p@xp \text{ and } xp@xx \text{ and } \forall xq{:}\ a \to \$o:\ ((p@xq \text{ and } xq@xx) \Rightarrow xq = xp))) \Rightarrow \exists s{:}\ a \to a \to \$o:\ (\forall xx{:}\ a{:}\ (s@xx@xx) \text{ and } \forall x$
$(s@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((s@xx@xy \text{ and } s@xy@xz) \Rightarrow (s@xx@xz)) \text{ and } p = (f@s))) \text{ and } \forall t{:}\ a \to a \to$
$\$o, u{:}\ a \to a \to \$o:\ ((t \neq u \text{ and } \forall xx{:}\ a{:}\ (t@xx@xx) \text{ and } \forall xx{:}\ a, xy{:}\ a{:}\ ((t@xx@xy) \Rightarrow (t@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((t@$
$(t@xx@xz)) \text{ and } \forall xx{:}\ a{:}\ (u@xx@xx) \text{ and } \forall xx{:}\ a, xy{:}\ a{:}\ ((u@xx@xy) \Rightarrow (u@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((u@xx@xy \text{ and }$
$(u@xx@xz))) \Rightarrow (f@t) \neq (f@u)))$ thf(cTHM265_pme, conjecture)

SEV040^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
$\forall xx{:}\ a \to a \to \$o, xy{:}\ a \to a \to \$o:\ ((\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xx@xx_0@xy_0) \Rightarrow (xx@xy_0@xx_0)) \text{ and } \forall xx_0{:}\ a, xy_0{:}\ a, xz{:}\ a{:}\ ((xx@xx_0@$
$(xx@xx_0@xz)) \text{ and } xx = xy) \Rightarrow (\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xy@xx_0@xy_0) \Rightarrow (xy@xy_0@xx_0)) \text{ and } \forall xx_0{:}\ a, xy_0{:}\ a, xz{:}\ a{:}\ ((xy@xx_0@xy$
$(xy@xx_0@xz)) \text{ and } xy = xx)) \text{ and } \forall xx{:}\ a \to a \to \$o, xy{:}\ a \to a \to \$o, xz{:}\ a \to a \to \$o:\ ((\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xx@xx_0@xy_0) \Rightarrow$
$(xx@xy_0@xx_0)) \text{ and } \forall xx_0{:}\ a, xy_0{:}\ a, xz_0{:}\ a{:}\ ((xx@xx_0@xy_0 \text{ and } xx@xy_0@xz_0) \Rightarrow (xx@xx_0@xz_0)) \text{ and } xx = xy \text{ and } \forall xx_0{:}\ a, x$
$(xy@xy_0@xx_0)) \text{ and } \forall xx_0{:}\ a, xy_0{:}\ a, xz_0{:}\ a{:}\ ((xy@xx_0@xy_0 \text{ and } xy@xy_0@xz_0) \Rightarrow (xy@xx_0@xz_0)) \text{ and } xy = xz) \Rightarrow$
$(\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xx@xx_0@xy_0) \Rightarrow (xx@xy_0@xx_0)) \text{ and } \forall xx_0{:}\ a, xy_0{:}\ a, xz_0{:}\ a{:}\ ((xx@xx_0@xy_0 \text{ and } xx@xy_0@xz_0) \Rightarrow$
$(xx@xx_0@xz_0)) \text{ and } xx = xz)) \text{ and } (\lambda xp{:}\ a \to a \to \$o, xq{:}\ a \to a \to \$o:\ (\forall xx{:}\ a, xy{:}\ a{:}\ ((xp@xx@xy) \Rightarrow$
$(xp@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((xp@xx@xy \text{ and } xp@xy@xz) \Rightarrow (xp@xx@xz)) \text{ and } xp = xq)) = (\lambda xp{:}\ a \to$
$a \to \$o, xq{:}\ a \to a \to \$o:\ (\forall xx{:}\ a, xy{:}\ a{:}\ ((xp@xx@xy) \Rightarrow (xp@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((xp@xx@xy \text{ and } xp@xy@xz)$
$(xp@xx@xz)) \text{ and } xp = xq))$ thf(cTHM515_pme, conjecture)

SEV041^5.p TPS problem from EQUIVALENCE-RELATIONS-THMS
a: \$tType thf(a_type, type)
b: \$tType thf(b_type, type)
$\forall xp{:}\ a \to a \to \$o, xq{:}\ a \to a \to \$o, xr{:}\ a \to b \to b \to \$o, xs{:}\ a \to b \to b \to \$o:\ ((\forall xx{:}\ a, xy{:}\ a{:}\ ((xp@xx@xy) \Rightarrow$
$(xp@xy@xx)) \text{ and } \forall xx{:}\ a, xy{:}\ a, xz{:}\ a{:}\ ((xp@xx@xy \text{ and } xp@xy@xz) \Rightarrow (xp@xx@xz)) \text{ and } xp = xq) \Rightarrow (\forall xx{:}\ a, xy{:}\ a{:}\ ((xp@$
$(\forall xx_0{:}\ b, xy_0{:}\ b{:}\ ((xr@xx@xx_0@xy_0) \Rightarrow (xr@xx@xy_0@xx_0)) \text{ and } \forall xx_0{:}\ b, xy_0{:}\ b, xz{:}\ b{:}\ ((xr@xx@xx_0@xy_0 \text{ and } xr@xx@xy_0@xz$
$(xr@xx@xx_0@xz)) \text{ and } (xr@xx) = (xr@xy))) \Rightarrow (\forall xx{:}\ a{:}\ ((xp@xx@xx) \Rightarrow (\forall xx_0{:}\ b, xy{:}\ b{:}\ ((xr@xx@xx_0@xy) \Rightarrow$
$(xr@xx@xy@xx_0)) \text{ and } \forall xx_0{:}\ b, xy{:}\ b, xz{:}\ b{:}\ ((xr@xx@xx_0@xy \text{ and } xr@xx@xy@xz) \Rightarrow (xr@xx@xx_0@xz)) \text{ and } (xr@xx) =$
$(xs@xx))) \Rightarrow (\forall xx{:}\ a \to b, xy{:}\ a \to b{:}\ (\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow (xr@xx_0@(xx@xx_0)@(xy@xy_0))) \Rightarrow$
$\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow (xr@xx_0@(xy@xx_0)@(xx@xy_0)))) \text{ and } \forall xx{:}\ a \to b, xy{:}\ a \to b, xz{:}\ a \to$
$b{:}\ ((\forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow (xr@xx_0@(xx@xx_0)@(xy@xy_0))) \text{ and } \forall xx_0{:}\ a, xy_0{:}\ a{:}\ ((xp@xx_0@xy_0) \Rightarrow$

$(\mathrm{xr@xx_0@(xy@xx_0)@(xz@xy_0)})))) \Rightarrow \forall \mathrm{xx_0}: a, \mathrm{xy_0}: a: ((\mathrm{xp@xx_0@xy_0}) \Rightarrow (\mathrm{xr@xx_0@(xx@xx_0)@(xz@xy_0)}))))$ and $(\lambda \mathrm{xf}: a \to b, \mathrm{xg}: a \to b: \forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{xp@xx@xy}) \Rightarrow (\mathrm{xr@xx@(xf@xx)@(xg@xy)}))) = (\lambda \mathrm{xf}: a \to b, \mathrm{xg}: a \to b: \forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{xq@xx@x}$ $(\mathrm{xs@xx@(xf@xx)@(xg@xy)}))))))))$ thf(cTHM517_pme, conjecture)

SEV042∧5.p TPS problem THM600
Existence of a symmetric, transitive closure (PER closure).
$\forall \mathrm{xr}: \$\mathrm{i} \to \$\mathrm{i} \to \$\mathrm{o}: \exists \mathrm{xs}: \$\mathrm{i} \to \$\mathrm{i} \to \$\mathrm{o}: (\forall \mathrm{xa}: \$\mathrm{i}, \mathrm{xb}: \$\mathrm{i}: ((\mathrm{xr@xa@xb}) \Rightarrow (\mathrm{xs@xa@xb}))$ and $\forall \mathrm{xx}: \$\mathrm{i}, \mathrm{xy}: \$\mathrm{i}: ((\mathrm{xs@xx@xy}) \Rightarrow$ $(\mathrm{xs@xy@xx}))$ and $\forall \mathrm{xx}: \$\mathrm{i}, \mathrm{xy}: \$\mathrm{i}, \mathrm{xz}: \$\mathrm{i}: ((\mathrm{xs@xx@xy}$ and $\mathrm{xs@xy@xz}) \Rightarrow (\mathrm{xs@xx@xz}))$ and $\forall \mathrm{xt}: \$\mathrm{i} \to \$\mathrm{i} \to \$\mathrm{o}: ((\forall \mathrm{xa}: \$\mathrm{i}, \mathrm{xb}: \$\mathrm{i}$ $(\mathrm{xt@xa@xb}))$ and $\forall \mathrm{xx}: \$\mathrm{i}, \mathrm{xy}: \$\mathrm{i}: ((\mathrm{xt@xx@xy}) \Rightarrow (\mathrm{xt@xy@xx}))$ and $\forall \mathrm{xx}: \$\mathrm{i}, \mathrm{xy}: \$\mathrm{i}, \mathrm{xz}: \$\mathrm{i}: ((\mathrm{xt@xx@xy}$ and $\mathrm{xt@xy@xz}) \Rightarrow$ $(\mathrm{xt@xx@xz}))) \Rightarrow \forall \mathrm{xa}: \$\mathrm{i}, \mathrm{xb}: \$\mathrm{i}: ((\mathrm{xs@xa@xb}) \Rightarrow (\mathrm{xt@xa@xb}))))$ thf(cTHM600_pme, conjecture)

SEV043∧5.p TPS problem from PERS-THMS
a: \$tType thf(a_type, type)
$\forall \mathrm{xp}: a \to a \to \$\mathrm{o}: ((\forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{xp@xx@xy}) \Rightarrow (\mathrm{xp@xy@xx}))$ and $\forall \mathrm{xx}: a, \mathrm{xy}: a, \mathrm{xz}: a: ((\mathrm{xp@xx@xy}$ and $\mathrm{xp@xy@xz}) \Rightarrow$ $(\mathrm{xp@xx@xz}))) \Rightarrow \forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{xp@xx@xy}) \Rightarrow (\mathrm{xp@xx@xx})))$ thf(cTHM510_pme, conjecture)

SEV044∧5.p TPS problem from PERS-THMS
b: \$tType thf(b_type, type)
a: \$tType thf(a_type, type)
$\forall \mathrm{xs}: b \to \$\mathrm{o}, \mathrm{xp}: b \to a \to a \to \$\mathrm{o}: (\forall \mathrm{xx}: b: ((\mathrm{xs@xx}) \Rightarrow (\forall \mathrm{xx_0}: a, \mathrm{xy}: a: ((\mathrm{xp@xx@xx_0@xy}) \Rightarrow (\mathrm{xp@xx@xy@xx_0}))$ and $\forall \mathrm{xx_0}:$ $(\mathrm{xp@xx@xx_0@xz}))))) \Rightarrow (\forall \mathrm{xx}: b \to a, \mathrm{xy}: b \to a: (\forall \mathrm{xx_0}: b: ((\mathrm{xs@xx_0}) \Rightarrow (\mathrm{xp@xx_0@(xx@xx_0)@(xy@xx_0)})) \Rightarrow$ $\forall \mathrm{xx_0}: b: ((\mathrm{xs@xx_0}) \Rightarrow (\mathrm{xp@xx_0@(xy@xx_0)@(xx@xx_0)}))))$ and $\forall \mathrm{xx}: b \to a, \mathrm{xy}: b \to a, \mathrm{xz}: b \to a: ((\forall \mathrm{xx_0}: b: ((\mathrm{xs@xx_0}) \Rightarrow$ $(\mathrm{xp@xx_0@(xx@xx_0)@(xy@xx_0)}))$ and $\forall \mathrm{xx_0}: b: ((\mathrm{xs@xx_0}) \Rightarrow (\mathrm{xp@xx_0@(xy@xx_0)@(xz@xx_0)}))) \Rightarrow \forall \mathrm{xx_0}: b: ((\mathrm{xs@xx_0}) \Rightarrow$ $(\mathrm{xp@xx_0@(xx@xx_0)@(xz@xx_0)})))))$ thf(cTHM506_pme, conjecture)

SEV045∧5.p TPS problem from PERS-THMS
a: \$tType thf(a_type, type)
b: \$tType thf(b_type, type)
g: $a \to b$ thf(g, type)
f: $a \to b$ thf(f, type)
cQ: $a \to b \to b \to \$\mathrm{o}$ thf(cQ, type)
cP: $a \to a \to \$\mathrm{o}$ thf(cP, type)
$\forall \mathrm{xx}: a: ((\mathrm{cP@xx@xx}) \Rightarrow (\mathrm{cQ@xx@}(f\mathrm{@xx})\mathrm{@}(g\mathrm{@xx}))) \Rightarrow (\forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{cP@xx@xy}) \Rightarrow (\mathrm{cQ@xx@}(f\mathrm{@xx})\mathrm{@}(f\mathrm{@xy}))) \Rightarrow$ $((\forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{cP@xx@xy}) \Rightarrow (\mathrm{cP@xy@xx}))$ and $\forall \mathrm{xx}: a, \mathrm{xy}: a, \mathrm{xz}: a: ((\mathrm{cP@xx@xy}$ and $\mathrm{cP@xy@xz}) \Rightarrow (\mathrm{cP@xx@xz}))) \Rightarrow$ $((\forall \mathrm{xx}: a: ((\mathrm{cP@xx@xx}) \Rightarrow (\forall \mathrm{xx_0}: b, \mathrm{xy}: b: ((\mathrm{cQ@xx@xx_0@xy}) \Rightarrow (\mathrm{cQ@xx@xy@xx_0}))$ and $\forall \mathrm{xx_0}: b, \mathrm{xy}: b, \mathrm{xz}: b: ((\mathrm{cQ@xx@xx_0@}$ $(\mathrm{cQ@xx@xx_0@xz}))))$ and $\forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{cP@xx@xy}) \Rightarrow (\mathrm{cQ@xx}) = (\mathrm{cQ@xy}))) \Rightarrow \forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{cP@xx@xy}) \Rightarrow$ $(\mathrm{cQ@xx@}(f\mathrm{@xx})\mathrm{@}(g\mathrm{@xy})))))$ thf(cTHM509_pme, conjecture)

SEV046∧5.p TPS problem from PERS-THMS
a: \$tType thf(a_type, type)
b: \$tType thf(b_type, type)
$\forall \mathrm{xp}: a \to a \to \$\mathrm{o}, \mathrm{xp_2}: a \to b \to b \to \$\mathrm{o}: ((\forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{xp@xx@xy}) \Rightarrow (\mathrm{xp@xy@xx}))$ and $\forall \mathrm{xx}: a, \mathrm{xy}: a, \mathrm{xz}: a: ((\mathrm{xp@xx@xy}$ $(\mathrm{xp@xx@xz}))$ and $\forall \mathrm{xx}: a: ((\mathrm{xp@xx@xx}) \Rightarrow (\forall \mathrm{xx_0}: b, \mathrm{xy}: b: ((\mathrm{xp_2@xx@xx_0@xy}) \Rightarrow (\mathrm{xp_2@xx@xy@xx_0}))$ and $\forall \mathrm{xx_0}: b, \mathrm{xy}: b, \mathrm{xz}$ $(\mathrm{xp_2@xx@xx_0@xz}))))$ and $\forall \mathrm{xx}: a, \mathrm{xy}: a: ((\mathrm{xp@xx@xy}) \Rightarrow (\mathrm{xp_2@xx}) = (\mathrm{xp_2@xy}))) \Rightarrow (\forall \mathrm{xx}: a \to b, \mathrm{xy}: a \to$ $b: (\forall \mathrm{xx_0}: a, \mathrm{xy_0}: a: ((\mathrm{xp@xx_0@xy_0}) \Rightarrow (\mathrm{xp_2@xx_0@(xx@xx_0)@(xy@xy_0)})) \Rightarrow \forall \mathrm{xx_0}: a, \mathrm{xy_0}: a: ((\mathrm{xp@xx_0@xy_0}) \Rightarrow$ $(\mathrm{xp_2@xx_0@(xy@xx_0)@(xx@xy_0)}))))$ and $\forall \mathrm{xx}: a \to b, \mathrm{xy}: a \to b, \mathrm{xz}: a \to b: ((\forall \mathrm{xx_0}: a, \mathrm{xy_0}: a: ((\mathrm{xp@xx_0@xy_0}) \Rightarrow$ $(\mathrm{xp_2@xx_0@(xx@xx_0)@(xy@xy_0)}))) \Rightarrow \forall \mathrm{xx_0}: a, \mathrm{xy_0}: a: ((\mathrm{xp@xx_0@xy_0}) \Rightarrow (\mathrm{xp_2@xx_0@(xy@xx_0)@(xz@xy_0)})))) \Rightarrow$ $\forall \mathrm{xx_0}: a, \mathrm{xy_0}: a: ((\mathrm{xp@xx_0@xy_0}) \Rightarrow (\mathrm{xp_2@xx_0@(xx@xx_0)@(xz@xy_0)}))))))$ thf(cTHM507_pme, conjecture)

SEV047∧5.p TPS problem THM175
Reflexivity of subrelation.
$\forall \mathrm{xs}: \$\mathrm{i} \to \$\mathrm{i} \to \$\mathrm{o}, \mathrm{xx}: \$\mathrm{i}, \mathrm{xy}: \$\mathrm{i}: ((\mathrm{xs@xx@xy}) \Rightarrow (\mathrm{xs@xx@xy}))$ thf(cTHM175_pme, conjecture)

SEV048∧5.p TPS problem THM120
There exists a transitive relation on sets.
$\exists r: (\$\mathrm{i} \to \$\mathrm{o}) \to (\$\mathrm{i} \to \$\mathrm{o}) \to \$\mathrm{o}: \forall \mathrm{xx}: \$\mathrm{i} \to \$\mathrm{o}, \mathrm{xy}: \$\mathrm{i} \to \$\mathrm{o}, \mathrm{xz}: \$\mathrm{i} \to \$\mathrm{o}: ((r\mathrm{@xx@xy}$ and $r\mathrm{@xy@xz}) \Rightarrow$ $(r\mathrm{@xx@xz}))$ thf(cTHM120_pme, conjecture)

SEV049∧5.p TPS problem THM120A
Variant of THM120 designed to eliminate trivial proof. Subset is one such relation.
$\exists r: (\$\mathrm{i} \to \$\mathrm{o}) \to (\$\mathrm{i} \to \$\mathrm{o}) \to \$\mathrm{o}: (\neg r\mathrm{@}\lambda \mathrm{xx}: \$\mathrm{i}: \$\mathrm{true}\mathrm{@}\lambda \mathrm{xx}: \$\mathrm{i}: \$\mathrm{false}$ and $\forall \mathrm{xx}: \$\mathrm{i} \to \$\mathrm{o}, \mathrm{xy}: \$\mathrm{i} \to \$\mathrm{o}, \mathrm{xz}: \$\mathrm{i} \to$ $\$\mathrm{o}: ((r\mathrm{@xx@xy}$ and $r\mathrm{@xy@xz}) \Rightarrow (r\mathrm{@xx@xz})))$ thf(cTHM120A_pme, conjecture)

SEV050∧5.p TPS problem THM599
Existence of reflexive closure.

a: $tType thf(a_type, type)
$\forall$xr: $a \to a \to$ $o: $\exists$xs: $a \to a \to$ $o: ($\forall$xa: a, xb: a: ((xr@xa@xb) $\Rightarrow$ (xs@xa@xb)) and $\forall$xx: a: (xs@xx@xx) and $\forall$xt: $a \to a \to$ $o: (($\forall$xa: a, xb: a: ((xr@xa@xb) $\Rightarrow$ (xt@xa@xb)) and $\forall$xx: a: (xt@xx@xx)) $\Rightarrow$ $\forall$xa: a, xb: a: ((xs@xa@xb) $\Rightarrow$ (xt@xa@xb)))) thf(cTHM599_pme, conjecture)

SEV051^5.p TPS problem THM557
Equality is an LC-relation.
a: $tType thf(a_type, type)
$\forall$xx: a: xx = xx and $\forall$xu: a, xv: a, xw: a: ((xu = xw and xv = xw) $\Rightarrow$ xu = xv) thf(cTHM557_pme, conjecture)

SEV052^5.p TPS problem THM120B
$\exists r$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o: ($\neg$ r@λxx: $i: $true@$\lambda$xx: $i: $false and $\forall$xx: $i $\to$ $o: ($r$@xx@xx) and $\forall$xx: $i $\to$ $o, xy: $i $\to$ $o, xz: $i $\to$ $o: (($r$@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz))) thf(cTHM120B_pme, conjecture)

SEV053^5.p TPS problem THM89B
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
cF: $b \to b$ thf(cF, type)
cA: $b \to a$ thf(cA, type)
cL: $a \to a \to$ $o thf(cL, type)
($\forall$xx: a, xy: a, xz: a: ((cL@xx@xy and cL@xy@xz) $\Rightarrow$ (cL@xx@xz)) and $\forall x$: b: (cL@(cA@x)@(cA@(cF@x)))) $\Rightarrow$ $\forall y$: b: (cL@(cA@y)@(cA@(cF@(cF@y)))) thf(cTHM89B_pme, conjecture)

SEV054^5.p TPS problem THM403
a: $tType thf(a_type, type)
$\forall r$: $a \to a \to$ $o, u: ($a \to$ $o) $\to$ a: (($\forall$xx: a, xy: a, xz: a: ((r@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz)) and $\forall$xs: $a \to$ $o: ($\forall$xz: a: ((xs@xz) $\Rightarrow$ (r@xz@(u@xs))) and $\forall$xj: a: ($\forall$xk: a: ((xs@xk) $\Rightarrow$ (r@xk@xj)) $\Rightarrow$ (r@(u@xs)@xj)))) $\Rightarrow$ $\forall$xf: $a \to a$: ($\forall$xx: a, xy: a: ((r@xx@xy) $\Rightarrow$ (r@(xf@xx)@(xf@xy))) $\Rightarrow$ $\exists$xw: a: (r@(xf@xw)@xw))) thf(cTHM403_pme, co

SEV055^5.p TPS problem THM402
a: $tType thf(a_type, type)
$\forall r$: $a \to a \to$ $o, u: ($a \to$ $o) $\to$ a: (($\forall$xx: a, xy: a, xz: a: ((r@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz)) and $\forall$xs: $a \to$ $o: ($\forall$xz: a: ((xs@xz) $\Rightarrow$ (r@xz@(u@xs))) and $\forall$xj: a: ($\forall$xk: a: ((xs@xk) $\Rightarrow$ (r@xk@xj)) $\Rightarrow$ (r@(u@xs)@xj)))) $\Rightarrow$ $\forall$xf: $a \to a$: ($\forall$xx: a, xy: a: ((r@xx@xy) $\Rightarrow$ (r@(xf@xx)@(xf@xy))) $\Rightarrow$ $\exists$xw: a: (r@xw@(xf@xw)))) thf(cTHM402_pme, co

SEV056^5.p TPS problem THM275
a: $tType thf(a_type, type)
$\forall$xr: $a \to a \to$ $o: $\exists$xp: $a \to a \to$ $o: ($\forall$xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$ (xp@xx@xy)) and $\forall$xx: a, xy: a, xz: a: ((xp@xx@xy and x
(xp@xx@xz))) thf(cTHM275_pme, conjecture)

SEV057^5.p TPS problem EQP1-1A
a: $tType thf(a_type, type)
$\forall$xx: $a \to$ $o: $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xx@(xs@xx$_0$))) and $\forall$xy: a: ((xx@xy) $\Rightarrow$ $\exists$xx$_0$: a: (xx@xx$_0$ and xy = (xs@xx$_0$) and $\forall$xz: a: ((xx@xz and xy = (xs@xz)) $\Rightarrow$ xz = xx$_0$)))) thf(cEQP1_1A_pme, conjecture)

SEV058^5.p TPS problem THM122
$\exists r$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o: ($\forall$xu: $i $\to$ $o, xv: $i $\to$ $o: (($r$@xu@xv) $\Rightarrow$ $\forall$xz: $i: ((xu@xz) $\Rightarrow$ (xv@xz))) and $\forall$xx: $i $\to$ $o: ($r$@xx@xx) and $\forall$xx: $i $\to$ $o, xy: $i $\to$ $o, xz: $i $\to$ $o: (($r$@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz))) thf(cTHM122_pme, conjecture)

SEV059^5.p TPS problem THM89A
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
cG: $b \to b$ thf(cG, type)
cA: $b \to a$ thf(cA, type)
c_less_: $a \to a \to$ $o thf(c_less_, type)
cF: $b \to b$ thf(cF, type)
($\forall$xx: a, xy: a, xz: a: ((c_less_@xx@xy and c_less_@xy@xz) $\Rightarrow$ (c_less_@xx@xz)) and $\forall x$: b: (c_less_@(cA@x)@(cA@(cF@x))) a
(λz: b: (cF@(cF@z)))) $\Rightarrow$ $\forall y$: b: (c_less_@(cA@y)@(cA@(cG@y))) thf(cTHM89A_pme, conjecture)

SEV060^5.p TPS problem THM173
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
$\forall$xx: b, xy: a, xs: $b \to a \to$ $o, xk: $b \to a \to$ $o: (($\forall$xx$_0$: b, xy$_9$: a: ((xk@xx$_0$@xy$_9$) $\Rightarrow$ (xs@xx$_0$@xy$_9$ or (xx$_0$ = xx and xy$_9$ = xy))) and $\neg$ xk@xx@xy) $\Rightarrow$ $\forall$xx$_0$: b, xy$_0$: a: ((xk@xx$_0$@xy$_0$) $\Rightarrow$ (xs@xx$_0$@xy$_0$))) thf(cTHM173_pme, conjec

SEV061^5.p TPS problem THM176
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
∀xx: b, xy: a, xs: $b \to a \to$ $o, xk: $b \to a \to$ $o: (∀xx$_2$: b, xy$_{47}$: a: ((xk@xx$_2$@xy$_{47}$) ⇒ (xs@xx$_2$@xy$_{47}$ or (xx$_2$ = xx and xy$_{47}$ = xy))) ⇒ ∀xx$_3$: b, xy$_{48}$: a: ((xk@xx$_3$@xy$_{48}$ and ¬ xx$_3$ = xx and xy$_{48}$ = xy) ⇒ (xs@xx$_3$@xy$_{48}$))) thf(cTHM

SEV062^5.p TPS problem T146A
∀xr: $i → $i → $o, xx: $i, xy: $i: (∀xp: $i → $i → $o: ((∀xx$_0$: i, xy_0$: $i: ((xr@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and ∀xu: $i, xv: $i (xp@xu@xw))) ⇒ (xp@xx@xy)) ⇒ ∀xp: $i → $i → $o: ((∀xx$_0$: i, xy_0$: $i: ((xr@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and ∀xx$_0$: $i, (xp@xx$_0$@xz))) ⇒ (xp@xx@xy))) thf(cT146A_pme, conjecture)

SEV063^5.p TPS problem THM136
The transitive closure of a relation is transitive.
a: $tType thf(a_type, type)
∀xr: $a \to a \to$ $o, xx: a, xy: a, xz: a: ((∀xp: $a \to a \to$ $o: ((∀xx$_0$: a, xy$_0$: a: ((xr@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and ∀xx$_0$: a, xy$_0$ (xp@xx$_0$@xz$_0$))) ⇒ (xp@xx@xy)) and ∀xp: $a \to a \to$ $o: ((∀xx$_0$: a, xy$_0$: a: ((xr@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and ∀xx$_0$: a, x (xp@xx$_0$@xz$_0$))) ⇒ (xp@xy@xz))) ⇒ ∀xp: $a \to a \to$ $o: ((∀xx$_0$: a, xy$_0$: a: ((xr@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and ∀xx$_0$: a, x (xp@xx$_0$@xz$_0$))) ⇒ (xp@xx@xz))) thf(cTHM136_pme, conjecture)

SEV064^5.p TPS problem THM120C
∃xr$_{28}$: ($i → $o) → ($i → $o) → $i → o, xr_{27}$: ($i → $o) → ($i → $o) → $i → $o: (¬ ∀xw$_2$: $i: (xr$_{27}$@λxx: $i: $true@λxx: $i: $ o, xw_2$: $i: (xr$_{27}$@xx@xx@xw$_2$ or xr$_{28}$@xx@xx@xw$_2$) and ∀xx: $i → $o, xy: $i → $o, xz: $i → $o: ((∀xw$_2$: $i: (xr$_{27}$@xx@xy@x ∀xw$_2$: $i: (xr$_{27}$@xx@xz@xw$_2$ or xr$_{28}$@xx@xz@xw$_2$))) thf(cTHM120C_pme, conjecture)

SEV065^5.p TPS problem THM177
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
∀xx: b, xy: a, xk: $b \to a \to$ $o: ((xk@xx@xy) ⇒ (λxu: b, xv: a: ((xk@xu@xv and ¬ xu = xx and xv = xy) or (xu = xx and xv = xy))) = xk) thf(cTHM177_pme, conjecture)

SEV066^5.p TPS problem THM120D
∃xr$_{28}$: ($i → $o) → ($i → $o) → $i → o, xr_{27}$: ($i → $o) → ($i → $o) → $i → $o: (∀xx: $i → o, xw_2$: $i: (xr$_{27}$@xx@xx@xw$_2$ $o, xy: $i → $o, xz: $i → $o: ((∀xw$_2$: $i: (xr$_{27}$@xx@xy@xw$_2$ or xr$_{28}$@xx@xy@xw$_2$) and ∀xw$_2$: $i: (xr$_{27}$@xy@xz@xw$_2$ or xr$_{28}$@x ∀xw$_2$: $i: (xr$_{27}$@xx@xz@xw$_2$ or xr$_{28}$@xx@xz@xw$_2$)) and ¬ ∀xw$_2$: $i: (xr$_{27}$@λxx: $i: $true@λxx: $i: $false@xw$_2$ or xr$_{28}$@λxx: $

SEV067^5.p TPS problem THM553
Downward closed subsets of a linear order are comparable.
a: $tType thf(a_type, type)
cS: $a \to$ $o thf(cS, type)
cT: $a \to$ $o thf(cT, type)
cR: $a \to a \to$ $o thf(cR, type)
(∀xx: a, xy: a, xz: a: ((cR@xx@xy and cR@xy@xz) ⇒ (cR@xx@xz)) and ∀xx: a: (cR@xx@xx) and ∀xx: a, xy: a: ((cR@xx@x xx = xy) and ∀xx: a, xy: a: (cR@xx@xy or cR@xy@xx) and ∀xu: a, xv: a: ((cR@xu@xv and cS@xv) ⇒ (cS@xu)) and ∀xu: a (cT@xu))) ⇒ (∀xx: a: ((cS@xx) ⇒ (cT@xx)) or ∀xx: a: ((cT@xx) ⇒ (cS@xx))) thf(cTHM553_pme, conjecture)

SEV068^5.p TPS problem THM275A-1
a: $tType thf(a_type, type)
∀xr: $a \to a \to$ $o: ∃xp: $a \to a \to$ $o: (∀xx: a, xy: a: ((xr@xx@xy) ⇒ (xp@xx@xy)) and ∀xx: a, xy: a, xz: a: ((xp@xx@xy and x (xp@xx@xz)) and ∀xq: $a \to a \to$ $o: ((∀xx: a, xy: a, xz: a: ((xq@xx@xy and xq@xy@xz) ⇒ (xq@xx@xz)) and ∀xx: a, xy: a: ((xq@xx@xy))) ⇒ ∀xx: a, xy: a: ((xp@xx@xy) ⇒ (xq@xx@xy)))) thf(cTHM275A_1_pme, conjecture)

SEV069^6.p TPS problem THM575
Existence of transitive closure.
∀xr: $i → $i → $o: ∃xs: $i → $i → $o: (∀xa: $i, xb: $i: ((xr@xa@xb) ⇒ (xs@xa@xb)) and ∀xx: $i, xy: $i, xz: $i: ((xs@xx@xy a (xs@xx@xz)) and ∀xt: $i → $i → $o: ((∀xa: $i, xb: $i: ((xr@xa@xb) ⇒ (xt@xa@xb)) and ∀xx: $i, xy: $i, xz: $i: ((xt@xx@xy a (xt@xx@xz))) ⇒ ∀xa: $i, xb: $i: ((xs@xa@xb) ⇒ (xt@xa@xb)))) thf(cTHM575_pme, conjecture)

SEV070^5.p TPS problem THM577
Inductive defn of ≤ on naturals is transitive.
cS: $i → $i thf(cS, type)
∀xx: $i, xy: $i, xz: $i: ((∀xp: $i → $o: ((xp@xx and ∀xn: $i: ((xp@xn) ⇒ (xp@(cS@xn)))) ⇒ (xp@xy)) and ∀xp: $i → $o: ((xp@xy and ∀xn: $i: ((xp@xn) ⇒ (xp@(cS@xn)))) ⇒ (xp@xz))) ⇒ ∀xp: $i → $o: ((xp@xx and ∀xn: $i: ((xp@xn) ⇒ (xp@(cS@xn)))) ⇒ (xp@xz))) thf(cTHM577_pme, conjecture)

SEV071^5.p TPS problem THM576

Existence of symmetric closure of a relation.
a: $tType thf(a_type, type)
$\forall$xr: $a \to a \to$ $o: $\exists$xs: $a \to a \to$ $o: ($\forall$xa: a, xb: a: ((xr@xa@xb) $\Rightarrow$ (xs@xa@xb)) and $\forall$xx: a, xy: a: ((xs@xx@xy) $\Rightarrow$ (xs@xy@xx)) and $\forall$xt: $a \to a \to$ $o: (($\forall$xa: a, xb: a: ((xr@xa@xb) $\Rightarrow$ (xt@xa@xb)) and $\forall$xx: a, xy: a: ((xt@xx@xy) $\Rightarrow$ (xt@xy@xx))) $\Rightarrow$ $\forall$xa: a, xb: a: ((xs@xa@xb) $\Rightarrow$ (xt@xa@xb)))) thf(cTHM576_pme, conjecture)

SEV072^5.p TPS problem THM522
Theorem about symmetric closure of relations.
a: $tType thf(a_type, type)
$\forall$xr: $a \to a \to$ $o, xx: a, xy: a: ((xr@xx@xy or xr@xy@xx) $\iff$ $\forall$xp: $a \to a \to$ $o: (($\forall$xx$_0$: a, xy$_0$: a: ((xr@xx$_0$@xy$_0$) $\Rightarrow$ (xp@xx$_0$@xy$_0$)) and $\forall$xx$_0$: a, xy$_0$: a: ((xp@xx$_0$@xy$_0$) $\Rightarrow$ (xp@xy$_0$@xx$_0$))) $\Rightarrow$ (xp@xx@xy))) thf(cTHM522_pme, conjectu

SEV074^5.p TPS problem THM523
Theorem about reflexive closure of relations.
a: $tType thf(a_type, type)
$\forall$xr: $a \to a \to$ $o, xx: a, xy: a: ((xr@xx@xy or xx = xy) $\iff$ $\forall$xp: $a \to a \to$ $o: (($\forall$xx$_0$: a, xy$_0$: a: ((xr@xx$_0$@xy$_0$) $\Rightarrow$ (xp@xx$_0$@xy$_0$)) and $\forall$xx$_0$: a: (xp@xx$_0$@xx$_0$)) $\Rightarrow$ (xp@xx@xy))) thf(cTHM523_pme, conjecture)

SEV075^5.p TPS problem THM152
Equivalence of two definitions of transitive closure.
$\forall$xr: $i $\to$ $i $\to$ $o, xx: $i, xy: $i: ($\forall$xq: $i $\to$ $o: (($\forall$xw: $i: ((xr@xx@xw) $\Rightarrow$ (xq@xw)) and $\forall$xv: $i, xw: $i: ((xq@xv and xr@xv
(xq@xw))) $\Rightarrow$ (xq@xy)) $\iff$ $\forall$xp: $i $\to$ $i $\to$ $o: (($\forall$xx$_0$: i, xy_0$: $i: ((xr@xx$_0$@xy$_0$) $\Rightarrow$ (xp@xx$_0$@xy$_0$)) and $\forall$xx$_0$: i, xy_0$: $i
(xp@xx$_0$@xz))) $\Rightarrow$ (xp@xx@xy))) thf(cTHM152_pme, conjecture)

SEV076^5.p TPS problem THM401B
In a complete lattice, every set has an upper bound.
a: $tType thf(a_type, type)
$\forall$rRR: $a \to a \to$ $o, u: ($a \to$ $o) $\to$ a: (($\forall$xx: a, xy: a, xz: a: ((rRR@xx@xy and rRR@xy@xz) $\Rightarrow$ (rRR@xx@xz)) and $\forall$xs: $a \to$
$o: ($\forall$xz: a: ((xs@xz) $\Rightarrow$ (rRR@xz@(u@xs))) and $\forall$xj: a: ($\forall$xk: a: ((xs@xk) $\Rightarrow$ (rRR@xk@xj)) $\Rightarrow$ (rRR@(u@xs)@xj)))) $\Rightarrow$
$\forall$xs: $a \to$ $o: $\exists$xb: a: $\forall$xz: a: ((xs@xz) $\Rightarrow$ (rRR@xz@xb))) thf(cTHM401B_pme, conjecture)

SEV079^5.p TPS problem from RELN-THMS
$\forall x$: $i, y: $i, z: $i: (($x = y$ and $y = z$) $\Rightarrow$ $x = z$) thf(cTRANS_ID_pme, conjecture)

SEV080^5.p TPS problem from RELN-THMS
a: $tType thf(a_type, type)
$\forall$xx: $a \to$ $o: $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xx@(xs@xx$_0$))) and $\forall$xy: a: ((xx@xy) $\Rightarrow$ $\exists$xy$_{28}$: a: (λxx$_0$: a: (xx@xx$_0$ and
(xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{28}$))) thf(cEQP_1A_pme, conjecture)

SEV081^5.p TPS problem from RELN-THMS
$\exists r$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o: ($\exists x$: $i $\to$ $o, y: $i $\to$ $o: ($r@x@y$) and $\forall$xx: $i $\to$ $o: ($r$@xx@xx) and $\forall$xx: $i $\to$
$o, xy: $i $\to$ $o, xz: $i $\to$ $o: (($r$@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz))) thf(cTHM120_1_pme, conjecture)

SEV082^5.p TPS problem from RELN-THMS
$\exists r$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o: ($\neg$ r@λxx: $i: $true@$\lambda$xx: $i: $false and $\forall$xx: $i $\to$ $o: ($r$@xx@xx) and $\forall$xx: $i $\to$
$o, xy: $i $\to$ $o, xz: $i $\to$ $o: (($r$@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz))) or $false thf(cTHM120_4_pme, conjecture)

SEV083^5.p TPS problem from RELN-THMS
$\exists r$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o: ($\neg$ r@λxx: $i: $true@$\lambda$xx: $i: $false and $\forall$xx: $i $\to$ $o: ($r$@xx@xx) and $\forall$xx: $i $\to$
$o, xy: $i $\to$ $o, xz: $i $\to$ $o: (($r$@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz))) and $true thf(cTHM120_3_pme, conjecture)

SEV084^5.p TPS problem from RELN-THMS
cP: $o thf(cP, type)
$\exists r$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o: ($\neg$ r@λxx: $i: (cP or $\neg$ cP)@λxx: $i: (cP and $\neg$ cP) and $\forall$xx: $i $\to$ $o: ($r$@xx@xx) and $\forall$xx: $
$o, xy: $i $\to$ $o, xz: $i $\to$ $o: (($r$@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz))) thf(cTHM120J_pme, conjecture)

SEV085^5.p TPS problem from RELN-THMS
$\exists r$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o: ($\exists x$: $i $\to$ $o, y: $i $\to$ $o: ($r$@$x$@$y$) and $\exists u$: $i $\to$ $o, v: $i $\to$ $o: $\neg$ r@u@v and $\forall$xx: $i $\to$
$o: ($r$@xx@xx) and $\forall$xx: $i $\to$ $o, xy: $i $\to$ $o, xz: $i $\to$ $o: (($r$@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz))) thf(cTHM120_2_p

SEV086^5.p TPS problem from RELN-THMS
$\exists r$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o: ($\forall$xx: $i $\to$ $o: ($r$@xx@xx) and $\forall$xx: $i $\to$ $o, xy: $i $\to$ $o, xz: $i $\to$
$o: (($r$@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz)) and $\forall x$: $i $\to$ $o, y: $i $\to$ $o: (($r$@$x$@$y$ and r@y@x) $\Rightarrow$ $\forall$xx: $i: (($x$@xx) $\iff$
(y@xx)))) thf(cTHM120I_pme, conjecture)

SEV087^5.p TPS problem from RELN-THMS

$\exists r$: ($\$i \to \$o) \to (\$i \to \$o) \to \$o$: ($\neg\, r@\lambda xx$: $\$i$: $\$true@\lambda xx$: $\$i$: $\$false and $\forall xx$: $\$i \to \$o$: ($r@xx@xx$) and $\forall xx$: $\$i \to \$o, xy$: $\$i \to \$o, xz$: $\$i \to \$o$: (($r@xx@xy and $r@xy@xz$) $\Rightarrow$ ($r@xx@xz$)) and $\forall x$: $\$i \to \$o, y$: $\$i \to \$o$: (($r@x@y and $r@y@x$) $\Rightarrow$ $x = y$)) thf(cTHM120H_pme, conjecture)

SEV088^5.p TPS problem from RELN-THMS
$\exists xr_{28}$: ($\$i \to \$o) \to (\$i \to \$o) \to \$i \to \$o, xr_{27}$: ($\$i \to \$o) \to (\$i \to \$o) \to \$i \to \$o$: ($\forall xx$: $\$i \to \$o, xy$: $\$i \to \$o, xz$: $\$i \to \$o$: (($\forall xw_2$: $\$i$: ($xr_{27}@xx@xy@xw_2$ or $xr_{28}@xx@xy@xw_2$) and $\forall xw_2$: $\$i$: ($xr_{27}@xy@xz@xw_2$ or $xr_{28}@xy@xz@xw_2$) $\forall xw_2$: $\$i$: ($xr_{27}@xx@xz@xw_2$ or $xr_{28}@xx@xz@xw_2$)) and $\forall xx$: $\$i \to \$o, xw_2$: $\$i$: ($xr_{27}@xx@xx@xw_2$ or $xr_{28}@xx@xx@xw_2$))

SEV089^5.p TPS problem from RELN-THMS
a: $\$tType thf(a_type, type)
$\forall xx$: $a \to \$o, xy$: $a \to \$o$: ($\exists xs$: $a \to a$: ($\forall xx_0$: a: (($xx@xx_0$) $\Rightarrow$ ($xy@(xs@xx_0)$)) and $\forall xy_0$: a: (($xy@xy_0$) $\Rightarrow$ $\exists xy_{38}$: a: (λxx_0: a: ($xx@xx_0$ and $xy_0 = (xs@xx_0)$))) = (λxx: a, xy: a: $xx = xy@xy_{38}$))) $\Rightarrow$ $\exists xs$: $a \to a$: ($\forall xx_0$: a: (($xy@xx_0$) $\Rightarrow$ ($xx@(xs@xx_0)$)) and $\forall xy_0$: a: (($xx@xy_0$) $\Rightarrow$ $\exists xy_{39}$: a: (λxx_0: a: ($xy@xx_0$ and $xy_0 = (xs@xx_0)$))) = (λxx: a, xy: a: $xx = xy@xy_{39}$)))) thf(cEQP_1B_pme, conjecture)

SEV090^5.p TPS problem from RELN-THMS
a: $\$tType thf(a_type, type)
$\exists xr$: $a \to a \to \$o$: ($\forall xx$: a: $\exists xw$: a: ($xr@xx@xw$) and $\forall xx$: a: $\neg\, xr@xx@xx$ and $\forall xx$: a, xy: a, xz: a: (($xr@xx@xy and $xr@xy@xz$) ($xr@xx@xz$))) $\Rightarrow$ $\exists r$: ($a \to \$o$) $\to$ ($a \to \$o$) $\to \$o$: ($\forall xx$: $a \to \$o$: $\exists xw$: $a \to \$o$: ($r@xx@xw$) and $\forall xx$: $a \to \$o$: $\neg\, r@xx@xx$ and $\forall xx$: $a \to \$o, xy$: $a \to \$o, xz$: $a \to \$o$: (($r@xx@xy and $r@xy@xz$) $\Rightarrow$ ($r@xx@xz$))) thf(cTHM165_pme

SEV091^5.p TPS problem from RELN-THMS
cQ: $\$i \to \$i \to \$o thf(cQ, type)
cP: $\$i \to \$i \to \$o thf(cP, type)
($\forall xx$: $\$i, xy$: $\$i, xz$: $\$i$: (($cP@xx@xy and $cP@xy@xz$) $\Rightarrow$ ($cP@xx@xz$)) and $\forall xx$: $\$i, xy$: $\$i, xz$: $\$i$: (($cQ@xx@xy and $cQ@xy@xz$) ($cQ@xx@xz$)) and $\forall xx$: $\$i, xy$: $\$i$: (($cQ@xx@xy$) $\Rightarrow$ ($cQ@xy@xx$)) and $\forall xx$: $\$i, xy$: $\$i$: ($cP@xx@xy or $cQ@xx@xy$)) $\Rightarrow$ ($\forall xx$: $\$i, xy$: $\$i$: ($cP@xx@xy$) or $\forall xx$: $\$i, xy$: $\$i$: ($cQ@xx@xy$)) thf(cCADE13_pme, conjecture)

SEV092^5.p TPS problem from RELN-THMS
$\forall xr$: $\$i \to \$i \to \$o, xx$: $\$i, xy$: $\$i$: ($\forall xp$: $\$i \to \$i \to \$o$: (($\forall xx_0$: $\$i, xy_0$: $\$i$: (($xr@xx_0@xy_0$) $\Rightarrow$ ($xp@xx_0@xy_0$)) and $\forall xx_0$: $\$i, xy_0$: ($xp@xx_0@xz$))) $\Rightarrow$ ($xp@xx@xy$)) $\Rightarrow$ $\forall xp$: $\$i \to \$i \to \$o$: (($\forall xx_0$: $\$i, xy_0$: $\$i$: (($xr@xx_0@xy_0$) $\Rightarrow$ ($xp@xx_0@xy_0$)) and $\forall xu$: $\$i,$ ($xp@xu@xw$))) $\Rightarrow$ ($xp@xx@xy$))) thf(cT146B_pme, conjecture)

SEV093^5.p TPS problem from RELN-THMS
$\forall xr$: $\$i \to \$i \to \$o, xx$: $\$i, xy$: $\$i$: ($\forall xp$: $\$i \to \$i \to \$o$: (($\forall xx_0$: $\$i, xy_0$: $\$i$: (($xr@xx_0@xy_0$) $\Rightarrow$ ($xp@xx_0@xy_0$)) and $\forall xu$: $\$i, xv$: $\$i$ ($xp@xu@xw$))) $\Rightarrow$ ($xp@xx@xy$)) $\iff$ $\forall xp$: $\$i \to \$i \to \$o$: (($\forall xx_0$: $\$i, xy_0$: $\$i$: (($xr@xx_0@xy_0$) $\Rightarrow$ ($xp@xx_0@xy_0$)) and $\forall xx_0$: ($xp@xx_0@xz$))) $\Rightarrow$ ($xp@xx@xy$))) thf(cT146_pme, conjecture)

SEV094^5.p TPS problem from RELN-THMS
a: $\$tType thf(a_type, type)
$\forall xx$: $a \to \$o, xy$: $a \to \$o$: ($\exists xs$: $a \to a$: ($\forall xx_0$: a: (($xx@xx_0$) $\Rightarrow$ ($xy@(xs@xx_0)$)) and $\forall xy_0$: a: (($xy@xy_0$) $\Rightarrow$ $\exists xx_0$: a: ($xx@xx_0$ and $xy_0 = (xs@xx_0)$ and $\forall xz$: a: (($xx@xz and $xy_0 = (xs@xz)$) $\Rightarrow$ $xz = xx_0$)))) $\Rightarrow$ $\exists xs$: $a \to a$: ($\forall xx_0$: a: (($xy@xx_0$) $\Rightarrow$ ($xx@(xs@xx_0)$)) and $\forall xy_0$: a: (($xx@xy_0$) $\Rightarrow$ $\exists xx_0$: a: ($xy@xx_0$ and $xy_0 = (xs@xx_0)$ and $\forall xz$: a: (($x (xs@xz)) $\Rightarrow$ $xz = xx_0$))))) thf(cEQP1_1B_pme, conjecture)

SEV095^5.p TPS problem from RELN-THMS
$\exists xr_{28}$: ($\$i \to \$o) \to (\$i \to \$o) \to \$i \to \$o, xr_{27}$: ($\$i \to \$o) \to (\$i \to \$o) \to \$i \to \$o$: ($\forall xu$: $\$i \to \$o, xv$: $\$i \to \$o$: ($\forall xw_2$: $\$i$: ($xr_{27}@xu@xv@xw_2$ or $xr_{28}@xu@xv@xw_2$) $\Rightarrow$ $\forall xz$: $\$i$: (($xu@xz$) $\Rightarrow$ ($xv@xz$))) and $\forall xx$: $\$i \to \$o, xw_2$: $\$i$: ($xr_{27}@xx@xx@xw_2$ or $xr_{28}@xx@xx@xw_2$) and $\forall xx$: $\$i \to \$o, xy$: $\$i \to \$o, xz$: $\$i \to \$o$: (($\forall xw_2$: $\$i$: ($xr_{27}@xx@xy@x \forall xw_2$: $\$i$: ($xr_{27}@xx@xz@xw_2$ or $xr_{28}@xx@xz@xw_2$))) thf(cTHM122C_pme, conjecture)

SEV096^5.p TPS problem from RELN-THMS
a: $\$tType thf(a_type, type)
b: $\$tType thf(b_type, type)
z: a thf(z, type)
cR: $a \to a \to \$o$ thf(cR, type)
f: $a \to b \to \$o$ thf(f, type)
cS: $b \to b \to \$o$ thf(cS, type)
($\forall xu$: a, xv: a, xw: a: (($cR@xu@xv and $cR@xw@xv$) $\Rightarrow$ ($cR@xu@xw$)) and $\forall xx$: a: ($cR@xx@xx$)) $\Rightarrow$ (($\forall xx$: a: $\exists xy$: b: ($f@xx$ ($cS@xy_1@xy_2$)) and $\forall xx_1$: a, xx_2: a, xy: b: (($f@xx_1@xy$ and $f@xx_2@xy$) $\Rightarrow$ ($cR@xx_1@xx_2$))) $\Rightarrow$ $\forall xy$: b: $\exists xx$: a: $\forall xw$: a: ($f@x$

SEV097^5.p TPS problem from RELN-THMS
a: $\$tType thf(a_type, type)
b: $\$tType thf(b_type, type)

z: a thf(z, type)
cR: $a \to a \to \$o$ thf(cR, type)
f: $a \to b \to \$o$ thf(f, type)
cS: $b \to b \to \$o$ thf(cS, type)
($\forall$xu: a, xv: a, xw: a: ((cR@xu@xv and cR@xw@xv) $\Rightarrow$ (cR@xu@xw)) and $\forall$xx: a: (cR@xx@xx)) $\Rightarrow$ (($\forall$xx: a: $\exists$xy: b: (f@xx
(cS@xy$_1$@xy$_2$)) and $\forall$xx$_1$: a, xx$_2$: a, xy: b: ((f@xx$_1$@xy and f@xx$_2$@xy) $\Rightarrow$ (cR@xx$_1$@xx$_2$))) $\Rightarrow$ $\forall$xx: a: $\exists$xy: b: $\forall$xw: a: (f@x

SEV098^5.p TPS problem from RELN-THMS
a: $tType thf(a_type, type)
$\forall$xr: $a \to a \to \$o$, xs: a, xt: a: ((xs $\neq$ xt and $\forall$xp: $a \to a \to \$o$: (($\forall$xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$ (xp@xx@xy)) and $\forall$xx: a, xy: a:
(xp@xx@xz))) $\Rightarrow$ (xp@xs@xt))) $\Rightarrow$ $\exists$xz: a: (xr@xs@xz and $\forall$xp: $a \to a \to \$o$: (($\forall$xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$
(xp@xx@xy)) and $\forall$xx: a, xy: a, xz$_0$: a: ((xp@xx@xy and xp@xy@xz$_0$) $\Rightarrow$ (xp@xx@xz$_0$))) $\Rightarrow$ (xp@xz@xt)))) thf(cTC_IN

SEV099^5.p TPS problem from RELN-THMS
a: $tType thf(a_type, type)
$\forall$xr: $a \to a \to \$o$, xs: a, xt: a: ((¬ xr@xs@xt and $\forall$xp: $a \to a \to \$o$: (($\forall$xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$ (xp@xx@xy)) and $\forall$xx: a,
(xp@xx@xz))) $\Rightarrow$ (xp@xs@xt))) $\Rightarrow$ $\exists$xz: a: (xr@xs@xz and $\forall$xp: $a \to a \to \$o$: (($\forall$xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$
(xp@xx@xy)) and $\forall$xx: a, xy: a, xz$_0$: a: ((xp@xx@xy and xp@xy@xz$_0$) $\Rightarrow$ (xp@xx@xz$_0$))) $\Rightarrow$ (xp@xz@xt)))) thf(cTC_IN

SEV100^5.p TPS problem from RELN-THMS
p: $o thf($p$, type)
$\exists$xr$_{28}$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $i $\to$ o, xr_{27}$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $i $\to$ $o: ($\forall$xx: $i $\to$ $o, xy: $i $\to$
$o, xz: $i $\to$ $o: (($\forall$xw$_2$: $i: (xr$_{27}$@xx@xy@xw$_2$ or xr$_{28}$@xx@xy@xw$_2$) and $\forall$xw$_2$: $i: (xr$_{27}$@xy@xz@xw$_2$ or xr$_{28}$@xy@xz@xw$_2$)
$\forall$xw$_2$: $i: (xr$_{27}$@xx@xz@xw$_2$ or xr$_{28}$@xx@xz@xw$_2$)) and $\forall$xx: $i $\to$ o, xw_2$: $i: (xr$_{27}$@xx@xx@xw$_2$ or xr$_{28}$@xx@xx@xw$_2$) and

SEV101^5.p TPS problem from RELN-THMS
p: $o thf($p$, type)
$\exists$xr$_{28}$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $i $\to$ o, xr_{27}$: ($i $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $i $\to$ $o: ($\forall$xx: $i $\to$ o, xw_2$: $i: (xr$_{27}$@xx@xx@xw$_2$ c
$o, xy: $i $\to$ $o, xz: $i $\to$ $o: (($\forall$xw$_2$: $i: (xr$_{27}$@xx@xy@xw$_2$ or xr$_{28}$@xx@xy@xw$_2$) and $\forall$xw$_2$: $i: (xr$_{27}$@xy@xz@xw$_2$ or xr$_{28}$@x
$\forall$xw$_2$: $i: (xr$_{27}$@xx@xz@xw$_2$ or xr$_{28}$@xx@xz@xw$_2$)) and ¬ $\forall$xw$_2$: $i: (xr$_{27}$@$\lambda$xx: $i: ($p$ or ¬ p)@λxx: $i: ($p$ and ¬ p)@xw$_2$ or x

SEV102^5.p TPS problem from RELN-THMS
a: $tType thf(a_type, type)
$\forall$xx: $a \to \$o$, xy: $a \to \$o$, xz: $a \to \$o$: (($\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xy@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xy@xy$_0$) $\Rightarrow$
$\exists$xy$_{52}$: a: (λxx$_0$: a: (xx@xx$_0$ and xy$_0$ = (xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{52}$))) and $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xy@xx$_0$) $\Rightarrow$
(xz@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xz@xy$_0$) $\Rightarrow$ $\exists$xy$_{53}$: a: (λxx$_0$: a: (xy@xx$_0$ and xy$_0$ = (xs@xx$_0$))) = (λxx: a, xy: a: xx =
xy@xy$_{53}$)))) $\Rightarrow$ $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xz@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xz@xy$_0$) $\Rightarrow$ $\exists$xy$_{55}$: a: (λxx$_0$: a: (xx@xx$_0$
(xs@xx$_0$))) = (λxx: a, xy: a: xx = xy@xy$_{55}$)))) thf(cEQP_1C_pme, conjecture)

SEV103^5.p TPS problem from RELN-THMS
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
cR: $a \to a \to \$o$ thf(cR, type)
cS: $b \to b \to \$o$ thf(cS, type)
($\forall$xu: a, xv: a, xw: a: ((cR@xu@xv and cR@xw@xv) $\Rightarrow$ (cR@xu@xw)) and $\forall$xx: a: (cR@xx@xx)) $\Rightarrow$ ($\exists$xf: $a \to b \to$
$o: ($\forall$xx: a: $\exists$xy: b: (xf@xx@xy) and $\forall$xx: a, xy$_1$: b, xy$_2$: b: ((xf@xx@xy$_1$ and xf@xx@xy$_2$) $\Rightarrow$ (cS@xy$_1$@xy$_2$)) and $\forall$xx$_1$: a, xx$_2$
(cR@xx$_1$@xx$_2$))) $\Rightarrow$ $\exists$xg: $b \to a \to \$o$: ($\forall$xx: a: $\exists$xy: b: (xg@xy@xx) and $\forall$xy: b, xx$_1$: a, xx$_2$: a: ((xg@xy@xx$_1$ and xg@xy@xx$_2$
(cR@xx$_1$@xx$_2$)) and $\forall$xy: b: $\exists$xx: a: (xg@xy@xx))) thf(cTHM552A_pme, conjecture)

SEV104^5.p TPS problem from RELN-THMS
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
cR: $a \to a \to \$o$ thf(cR, type)
z: a thf(z, type)
f: $a \to b \to \$o$ thf(f, type)
cS: $b \to b \to \$o$ thf(cS, type)
($\forall$xu: a, xv: a, xw: a: ((cR@xu@xv and cR@xw@xv) $\Rightarrow$ (cR@xu@xw)) and $\forall$xx: a: (cR@xx@xx)) $\Rightarrow$ (($\forall$xx: a: $\exists$xy: b: (f@xx
(cS@xy$_1$@xy$_2$)) and $\forall$xx$_1$: a, xx$_2$: a, xy: b: ((f@xx$_1$@xy and f@xx$_2$@xy) $\Rightarrow$ (cR@xx$_1$@xx$_2$))) $\Rightarrow$ $\forall$xy: b, xx$_1$: a, xx$_2$: a: (($\forall$xw
(cR@xx$_1$@xx$_2$))) thf(cTHM552D_pme, conjecture)

SEV105^5.p TPS problem from RELN-THMS
atype: $tType thf(a_type, type)
a: atype thf(a, type)
b: atype thf(b, type)

$\forall$xr: atype $\to$ atype $\to$ \$o, t: atype $\to$ atype $\to$ \$o: (($\forall$xx: atype: (t@xx@xx) and $\forall$xx: atype, xy: atype, xz: atype: ((t@xx@xy a
(t@xx@xz)) and $\forall$xx: atype, xy: atype: ((xr@xx@xy) $\Rightarrow$ (t@xx@xy)) and $\forall s$: atype $\to$ atype $\to$ \$o: (($\forall$xx: atype: (s@xx@xx)
(s@xx@xz)) and $\forall$xx: atype, xy: atype: ((xr@xx@xy) $\Rightarrow$ (s@xx@xy))) $\Rightarrow$ $\forall$xx: atype, xy: atype: ((t@xx@xy) $\Rightarrow$
(s@xx@xy)))) $\Rightarrow$ (($a \neq b$ and t@a@b) $\Rightarrow$ $\exists$xc: atype: (xr@a@xc and t@xc@b))) thf(cTC_INTERP_OTHER_pme, conject

SEV106^5.p TPS problem from RELN-THMS
a: \$tType thf(a_type, type)
$\forall$xx: $a \to$ \$o, xy: $a \to$ \$o, xz: $a \to$ \$o: (($\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xy@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xy@xy$_0$) $\Rightarrow$
$\exists$xx$_0$: a: (xx@xx$_0$ and xy$_0$ = (xs@xx$_0$) and $\forall$xz$_0$: a: ((xx@xz$_0$ and xy$_0$ = (xs@xz$_0$)) $\Rightarrow$ xz$_0$ = xx$_0$)))) and $\exists$xs: $a \to$
a: ($\forall$xx$_0$: a: ((xy@xx$_0$) $\Rightarrow$ (xz@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xz@xy$_0$) $\Rightarrow$ $\exists$xx$_0$: a: (xy@xx$_0$ and xy$_0$ = (xs@xx$_0$) and $\forall$xz$_0$: a: ((
(xs@xz$_0$)) $\Rightarrow$ xz$_0$ = xx$_0$))))) $\Rightarrow$ $\exists$xs: $a \to a$: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (xz@(xs@xx$_0$))) and $\forall$xy$_0$: a: ((xz@xy$_0$) $\Rightarrow$
$\exists$xx$_0$: a: (xx@xx$_0$ and xy$_0$ = (xs@xx$_0$) and $\forall$xz$_0$: a: ((xx@xz$_0$ and xy$_0$ = (xs@xz$_0$)) $\Rightarrow$ xz$_0$ = xx$_0$))))) thf(cEQP1_1C_pme

SEV107^5.p TPS problem from RELN-THMS
a: \$tType thf(a_type, type)
z: a thf(z, type)
cR: $a \to a \to$ \$o thf(cR, type)
f: $a \to$ \$i $\to$ \$o thf(f, type)
cS: \$i $\to$ \$i $\to$ \$o thf(cS, type)
($\forall$xu: a, xv: a, xw: a: ((cR@xu@xv and cR@xw@xv) $\Rightarrow$ (cR@xu@xw)) and $\forall$xx: a: (cR@xx@xx)) $\Rightarrow$ (($\forall$xx: a: $\exists$xy: \$i: (f@xx
(cS@xy$_1$@xy$_2$)) and $\forall$xx$_1$: a, xx$_2$: a, xy: \$i: ((f@xx$_1$@xy and f@xx$_2$@xy) $\Rightarrow$ (cR@xx$_1$@xx$_2$))) $\Rightarrow$ ($\forall$xx: a: $\exists$xy: \$i: $\forall$xw: a: (f
(cR@xx$_1$@xx$_2$)) and $\forall$xy: \$i: $\exists$xx: a: $\forall$xw: a: (f@xx@xy or ($\neg f$@xw@xy and cR@xx@z)))) thf(cTHM552B_pme, conjectu

SEV108^5.p TPS problem from RELN-THMS
$\forall r$: \$i $\to$ \$i $\to$ \$o, a: \$i, b: \$i, c: \$i, d: \$i, e: \$i, f: \$i: (($\forall$xx: \$i, xy: \$i: ((r@xx@xy) $\Rightarrow$ (r@xy@xx)) and $a \neq$
b and $a \neq c$ and $a \neq d$ and $a \neq e$ and $a \neq f$ and $b \neq c$ and $b \neq d$ and $b \neq e$ and $b \neq f$ and $c \neq d$ and $c \neq$
e and $c \neq f$ and $d \neq e$ and $d \neq f$ and $e \neq f$) $\Rightarrow$ $\exists$xa: \$i, xb: \$i, xc: \$i: (xa $\neq$ xb and xa $\neq$ xc and xb $\neq$
xc and ((r@xa@xb and r@xa@xc and r@xb@xc) or ($\neg r$@xa@xb and $\neg r$@xa@xc and $\neg r$@xb@xc)))) thf(cSIX_THEORE

SEV109^5.p TPS problem from RELN-THMS
a: \$tType thf(a_type, type)
$\forall r$: $a \to a \to$ \$o, s: $a \to a \to$ \$o, xx: a, xy: a: ($\forall$xq$_1$: $a \to a \to$ \$o: (($\forall$xs: a, xt: a: ((r@xs@xt or s@xs@xt) $\Rightarrow$
(xq$_1$@xs@xt)) and $\forall$xx$_0$: a, xy$_0$: a, xz: a: ((xq$_1$@xx$_0$@xy$_0$ and xq$_1$@xy$_0$@xz) $\Rightarrow$ (xq$_1$@xx$_0$@xz))) $\Rightarrow$ (xq$_1$@xx@xy)) $\Rightarrow$
$\forall$xp$_1$: $a \to a \to$ \$o: (($\forall$xss: a, xtt: a: (($\forall$xq$_2$: $a \to a \to$ \$o: (($\forall$xsss: a, xttt: a: ((r@xsss@xttt) $\Rightarrow$ (xq$_2$@xsss@xttt)) and $\forall$xx$_0$: a,
(xq$_2$@xx$_0$@xz))) $\Rightarrow$ (xq$_2$@xss@xtt)) or $\forall$xq$_3$: $a \to a \to$ \$o: (($\forall$xssss: a, xtttt: a: ((s@xssss@xtttt) $\Rightarrow$ (xq$_3$@xssss@xtttt)) and
(xq$_3$@xx$_0$@xz))) $\Rightarrow$ (xq$_3$@xss@xtt))) $\Rightarrow$ (xp$_1$@xss@xtt)) and $\forall$xx$_0$: a, xy$_0$: a, xz: a: ((xp$_1$@xx$_0$@xy$_0$ and xp$_1$@xy$_0$@xz) $\Rightarrow$
(xp$_1$@xx$_0$@xz))) $\Rightarrow$ (xp$_1$@xx@xy))) thf(cTHM251F_pme, conjecture)

SEV113^5.p TPS problem from RELN-THMS
a: \$tType thf(a_type, type)
$\forall k$: ($a \to a \to$ \$o) $\to a \to a \to$ \$o: ($\forall$xr$_1$: $a \to a \to$ \$o, xr$_2$: $a \to a \to$ \$o: ($\forall$xx: a, xy: a: ((xr$_1$@xx@xy) $\Rightarrow$
(xr$_2$@xx@xy)) $\Rightarrow$ $\forall$xx: a, xy: a: ((k@xr$_1$@xx@xy) $\Rightarrow$ (k@xr$_2$@xx@xy))) $\Rightarrow$ $\exists l$: $a \to a \to$ \$o: ($\forall$xx: a, xy: a: ((l@xx@xy) $\Rightarrow$
(k@l@xx@xy)) and $\forall$xx: a, xy: a: ((k@l@xx@xy) $\Rightarrow$ (l@xx@xy)) and $\forall t$: $a \to a \to$ \$o: ($\forall$xx: a, xy: a: ((k@t@xx@xy) $\Rightarrow$
(t@xx@xy)) $\Rightarrow$ $\forall$xx: a, xy: a: ((l@xx@xy) $\Rightarrow$ (t@xx@xy))))) $\Rightarrow$ $\forall$xr: $a \to a \to$ \$o: $\exists$xs: $a \to a \to$
\$o: ($\forall$xa: a, xb: a: ((xr@xa@xb) $\Rightarrow$ (xs@xa@xb)) and $\forall$xx: a, xy: a: ((xs@xx@xy) $\Rightarrow$ (xs@xy@xx)) and $\forall$xt: $a \to$
$a \to$ \$o: (($\forall$xa: a, xb: a: ((xr@xa@xb) $\Rightarrow$ (xt@xa@xb)) and $\forall$xx: a, xy: a: ((xt@xx@xy) $\Rightarrow$ (xt@xy@xx))) $\Rightarrow$
$\forall$xa: a, xb: a: ((xs@xa@xb) $\Rightarrow$ (xt@xa@xb)))) thf(cTHM576_LFP_pme, conjecture)

SEV114^5.p TPS problem from RELN-THMS
a: \$tType thf(a_type, type)
$\forall x_2$: ($a \to$ \$o) $\to$ \$o: $\exists m$: ($a \to$ \$o) $\to$ \$o: ($\forall$xx: $a \to$ \$o: ((m@xx) $\Rightarrow$ (x_2@xx)) and $\forall u$: $a \to$ \$o, v: $a \to$
\$o: ((m@u and m@v) $\Rightarrow$ ($\forall$xx: a: ((u@xx) $\Rightarrow$ (v@xx)) or $\forall$xx: a: ((v@xx) $\Rightarrow$ (u@xx)))) and $\forall$xy: ($a \to$ \$o) $\to$
\$o: (($\forall$xx: $a \to$ \$o: ((xy@xx) $\Rightarrow$ (x_2@xx)) and $\forall u$: $a \to$ \$o, v: $a \to$ \$o: ((xy@u and xy@v) $\Rightarrow$ ($\forall$xx: a: ((u@xx) $\Rightarrow$
(v@xx)) or $\forall$xx: a: ((v@xx) $\Rightarrow$ (u@xx)))) and $\forall$xx: $a \to$ \$o: ((m@xx) $\Rightarrow$ (xy@xx))) $\Rightarrow$ $\forall$xx: $a \to$ \$o: ((xy@xx) $\Rightarrow$
(m@xx)))) $\Rightarrow$ $\forall r$: $a \to a \to$ \$o: (($\forall$xx: a, xy: a, xz: a: ((r@xx@xy and r@xy@xz) $\Rightarrow$ (r@xx@xz)) and $\forall$xx: a: (r@xx@xx) and
xx = xy)) $\Rightarrow$ $\exists s$: $a \to$ \$o: ($\forall$xx: a, xy: a: ((s@xx and s@xy) $\Rightarrow$ (r@xx@xy or r@xy@xx)) and $\forall$xy: $a \to$
\$o: (($\forall$xx: a, xy$_0$: a: ((xy@xx and xy@xy$_0$) $\Rightarrow$ (r@xx@xy$_0$ or r@xy$_0$@xx)) and $\forall$xx: a: ((s@xx) $\Rightarrow$ (xy@xx))) $\Rightarrow$
$\forall$xx: a: ((xy@xx) $\Rightarrow$ (s@xx))))) thf(cTHM540_pme, conjecture)

SEV115^5.p TPS problem from RELN-THMS
a: \$tType thf(a_type, type)
$\forall r$: ($a \to$ \$o) $\to$ ($a \to$ \$o) $\to$ \$o: (($\forall$xx: $a \to$ \$o, xy: $a \to$ \$o, xz: $a \to$ \$o: ((r@xx@xy and r@xy@xz) $\Rightarrow$
(r@xx@xz)) and $\forall$xx: $a \to$ \$o: (r@xx@xx) and $\forall$xx: $a \to$ \$o, xy: $a \to$ \$o: ((r@xx@xy and r@xy@xx) $\Rightarrow$ xx =

xy)) ⇒ ∃s: (a → $o) → $o: (∀xx: a → $o, xy: a → $o: (($s$@xx and s@xy) ⇒ (r@xx@xy or r@xy@xx)) and ∀xy: (a → $o) → $o: ((∀xx: a → o, xy_0$: a → $o: ((xy@xx and xy@xy$_0$) ⇒ ($r$@xx@xy$_0$ or r@xy$_0$@xx)) and ∀xx: a → $o: (($s$@xx) ⇒ (xy@xx))) ⇒ ∀xx: a → $o: ((xy@xx) ⇒ ($s$@xx))))) ⇒ ∀$x_2$: ($a$ → $o) → $o: ∃$m$: ($a$ → $o) → $o: (∀xx: a → $o: (($m$@xx) ⇒ ($x_2$@xx)) and ∀$u$: a → $o, v: a → $o: (($m$@$u$ and m@v) ⇒ (∀xx: a: ((u@xx) ⇒ (v@xx)) or ∀xx: a: ((v@xx) ⇒ (u@xx)))) and ∀xy: (a → $o) → $o: ((∀xx: a → $o: ((xy@xx) ⇒ ($x_2$@xx)) and ∀$u$: a → $o, v: a → $o: ((xy@$u$ and xy@v) ⇒ (∀xx: a: ((u@xx) ⇒ (v@xx)) or ∀xx: a: ((v@xx) ⇒ (u@xx)))) and ∀xx: a → $o: (($m$@xx) ⇒ (xy@xx))) ⇒ ∀xx: a → $o: ((xy@xx) ⇒ ($m$@xx)))) thf(cTHM536_pme, conjecture)

SEV116^5.p TPS problem STRANGE-HO-EXAMPLE
cS: ($i → $i → $o) → $o thf(cS_type, type)
x: $i thf(x_type, type)
y: $i thf(y_type, type)
cSTRANGE_HO_ABBR: (($i → $i → $o) → $o) → $i → $i → $o thf(cSTRANGE_HO_ABBR_type, type)
cSTRANGE_HO_ABBR = (λs: ($i → $i → $o) → $o, xx: $i, xy: $i: ∀xp: $i → $i → $o: (($s$@xp and xp@xx@xy) ⇒ (xp@xy@xx))) thf(cSTRANGE_HO_ABBR_def, definition)
(cS@(cSTRANGE_HO_ABBR@cS) and cSTRANGE_HO_ABBR@cS@x@y) ⇒ (cSTRANGE_HO_ABBR@cS@y@x) thf(

SEV117^5.p TPS problem from PER-CLOSURE-THMS
a: $tType thf(a_type, type)
y: a thf(y, type)
r: a → a → $o thf($r$, type)
x: a thf(x, type)
∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a: ((r@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and ∀xx$_0$: a, xy$_0$: a: ((xp@xx$_0$@xy$_0$) ⇒ (xp@xy$_0$@xx$_0$)) and ∀xx$_0$: a, xy$_0$: a, xz: a: ((xp@xx$_0$@xy$_0$ and xp@xy$_0$@xz) ⇒ (xp@xx$_0$@xz))) ⇒ (xp@x@y)) ⇒ ∀xq: a → $o: ((∀xw: a: ((r@x@xw or r@xw@x) ⇒ (xq@xw)) and ∀xv: a, xw: a: ((xq@xv and (r@xv@xw or r@xw@xv)) ⇒ (xq@xw))) ⇒ (xq@y)) thf(cTHM526_2_pme, conjecture)

SEV118^5.p TPS problem from PER-CLOSURE-THMS
a: $tType thf(a_type, type)
∀xr: a → a → $o, xx: a, xy: a: (∀xq: a → $o: ((∀xw: a: ((xr@xx@xw or xr@xw@xx) ⇒ (xq@xw)) and ∀xv: a, xw: a: ((xq@xv
(xq@xw))) ⇒ (xq@xy)) ⟺ ∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a: ((xr@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and ∀xx$_0$: a, xy$_0$: a: ((
(xp@xy$_0$@xx$_0$)) and ∀xx$_0$: a, xy$_0$: a, xz: a: ((xp@xx$_0$@xy$_0$ and xp@xy$_0$@xz) ⇒ (xp@xx$_0$@xz))) ⇒ (xp@xx@xy))) thf(cT

SEV119^5.p TPS problem THM252
a: $tType thf(a_type, type)
∀pROP: (a → a → $o) → $o, r: a → a → $o, s: a → a → $o: (λxx: a, xy: a: ∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a: ((r@xx$_0$@xy$_0$ o
(xp@xx$_0$@xy$_0$)) and pROP@xp) ⇒ (xp@xx@xy))) = (λxx: a, xy: a: ∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a: ((∀xp$_0$: a →
a → $o: ((∀xx$_1$: a, xy$_1$: a: ((r@xx$_1$@xy$_1$) ⇒ (xp$_0$@xx$_1$@xy$_1$)) and pROP@xp$_0$) ⇒ (xp$_0$@xx$_0$@xy$_0$)) or ∀xp$_0$: a →
a → $o: ((∀xx$_1$: a, xy$_1$: a: ((s@xx$_1$@xy$_1$) ⇒ (xp$_0$@xx$_1$@xy$_1$)) and pROP@xp$_0$) ⇒ (xp$_0$@xx$_0$@xy$_0$))) ⇒
(xp@xx$_0$@xy$_0$)) and pROP@xp) ⇒ (xp@xx@xy))) thf(cTHM252_pme, conjecture)

SEV120^5.p TPS problem THM70
The intersection of any class of transitive relations is transitive.
a: $tType thf(a_type, type)
∀s: (a → a → $o) → $o, xx: a, xy: a, xz: a: ((∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a, xz$_0$: a: ((xp@xx$_0$@xy$_0$ and xp@xy$_0$@xz$_0$) ⇒
(xp@xx$_0$@xz$_0$)) and s@xp) ⇒ (xp@xx@xy)) and ∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a, xz$_0$: a: ((xp@xx$_0$@xy$_0$ and xp@xy$_0$@xz
(xp@xx$_0$@xz$_0$)) and s@xp) ⇒ (xp@xy@xz))) ⇒ ∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a, xz$_0$: a: ((xp@xx$_0$@xy$_0$ and xp@xy$_0$@xz
(xp@xx$_0$@xz$_0$)) and s@xp) ⇒ (xp@xx@xz))) thf(cTHM70_pme, conjecture)

SEV121^5.p TPS problem THM47C
(λxu: $i, xv: $i: xu = xv) = (λxx: $i, xy: $i: ∀xp: $i → $i → $o: (∀xx$_0$: $i: (xp@xx$_0$@xx$_0$) ⇒ (xp@xx@xy))) thf(cTHM47C

SEV122^5.p TPS problem THM530
a: $tType thf(a_type, type)
∀pROP: (a → a → $o) → $o, f: (a → a → $o) → $o: (λxx: a, xy: a: ∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a: (∃r: a →
a → $o: ($r$@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and pROP@xp) ⇒ (xp@xx@xy))) = (λxx: a, xy: a: ∀xp: a → a →
$o: ((∀xx$_0$: a, xy$_0$: a: (∃r: a → a → $o: ($r$@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and pROP@xp) ⇒ (xp@xx@xy))) thf(cTHM53

SEV123^5.p TPS problem from SETS-OF-RELNS-THMS
a: $tType thf(a_type, type)
∀pROP: (a → a → $o) → $o, s: (a → a → $o) → $o, xx: a, xy: a: (∀xp: a → a → $o: ((∀xx$_0$: a, xy$_0$: a: (∃r: a →
a → $o: (∃$q$: a → a → $o: ($s$@$q$ and r = (λxx$_1$: a, xy$_1$: a: ∀xp$_0$: a → a → $o: ((∀xx$_2$: a, xy$_2$: a: ((q@xx$_2$@xy$_2$) ⇒
(xp$_0$@xx$_2$@xy$_2$)) and pROP@xp$_0$) ⇒ (xp$_0$@xx$_1$@xy$_1$)))) and r@xx$_0$@xy$_0$) ⇒ (xp@xx$_0$@xy$_0$)) and pROP@xp) ⇒

$(\mathrm{xp@xx@xy})) \Rightarrow \forall \mathrm{xp}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to a \to \$o\colon (s@r \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow (\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } \mathrm{pROP}$
$(\mathrm{xp@xx@xy})))$ thf(cTHM254_B_pme, conjecture)

SEV124^5.p TPS problem from SETS-OF-RELNS-THMS
a: \$tType thf(a_type, type)
$\forall \mathrm{pROP}\colon (a \to a \to \$o) \to \$o, s\colon (a \to a \to \$o) \to \$o, \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon (\forall \mathrm{xp}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to$
$a \to \$o\colon (s@r \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow (\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } \mathrm{pROP@xp}) \Rightarrow (\mathrm{xp@xx@xy})) \Rightarrow \forall \mathrm{xp}\colon a \to a \to$
$\$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to a \to \$o\colon (\exists q\colon a \to a \to \$o\colon (s@q \text{ and } r = (\lambda \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon \forall \mathrm{xp}_0\colon a \to a \to$
$\$o\colon ((\forall \mathrm{xx}_2\colon a, \mathrm{xy}_2\colon a\colon ((q@\mathrm{xx}_2@\mathrm{xy}_2) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_2@\mathrm{xy}_2)) \text{ and } \mathrm{pROP@xp}_0) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_1@\mathrm{xy}_1)))) \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow$
$(\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } \mathrm{pROP@xp}) \Rightarrow (\mathrm{xp@xx@xy})))$ thf(cTHM254_A_pme, conjecture)

SEV125^5.p TPS problem from SETS-OF-RELNS-THMS
a: \$tType thf(a_type, type)
$\forall \mathrm{pROP}\colon (a \to a \to \$o) \to \$o, s\colon (a \to a \to \$o) \to \$o\colon (\lambda \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon \forall \mathrm{xp}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to$
$a \to \$o\colon (s@r \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow (\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } \mathrm{pROP@xp}) \Rightarrow (\mathrm{xp@xx@xy}))) = (\lambda \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon \forall \mathrm{xp}\colon a \to$
$a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to a \to \$o\colon (\exists q\colon a \to a \to \$o\colon (s@q \text{ and } r = (\lambda \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon \forall \mathrm{xp}_0\colon a \to a \to$
$\$o\colon ((\forall \mathrm{xx}_2\colon a, \mathrm{xy}_2\colon a\colon ((q@\mathrm{xx}_2@\mathrm{xy}_2) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_2@\mathrm{xy}_2)) \text{ and } \mathrm{pROP@xp}_0) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_1@\mathrm{xy}_1)))) \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow$
$(\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } \mathrm{pROP@xp}) \Rightarrow (\mathrm{xp@xx@xy})))$ thf(cTHM254_pme, conjecture)

SEV126^5.p TPS problem from SETS-OF-RELNS-THMS
a: \$tType thf(a_type, type)
$\forall p\colon (a \to a \to \$o) \to \$o, r\colon a \to a \to \$o, s\colon a \to a \to \$o, \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon (\forall \mathrm{xp}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon ((r@\mathrm{xx}_0@\mathrm{xy}_0 \text{ or } s@\mathrm{xx}$
$(\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } p@\mathrm{xp}) \Rightarrow (\mathrm{xp@xx@xy})) \Rightarrow \forall \mathrm{xp}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon ((\forall \mathrm{xp}_0\colon a \to a \to$
$\$o\colon ((\forall \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon ((r@\mathrm{xx}_1@\mathrm{xy}_1) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_1@\mathrm{xy}_1)) \text{ and } p@\mathrm{xp}_0) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_0@\mathrm{xy}_0)) \text{ or } \forall \mathrm{xp}_0\colon a \to a \to$
$\$o\colon ((\forall \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon ((s@\mathrm{xx}_1@\mathrm{xy}_1) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_1@\mathrm{xy}_1)) \text{ and } p@\mathrm{xp}_0) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_0@\mathrm{xy}_0))) \Rightarrow (\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } p@\mathrm{xp}) =$
$(\mathrm{xp@xx@xy})))$ thf(cTHM252B_pme, conjecture)

SEV127^5.p TPS problem from SETS-OF-RELNS-THMS
a: \$tType thf(a_type, type)
$\forall p\colon (a \to a \to \$o) \to \$o, r\colon a \to a \to \$o, s\colon a \to a \to \$o, \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon (\forall \mathrm{xp}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon ((\forall \mathrm{xp}_0\colon a \to$
$a \to \$o\colon ((\forall \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon ((r@\mathrm{xx}_1@\mathrm{xy}_1) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_1@\mathrm{xy}_1)) \text{ and } p@\mathrm{xp}_0) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_0@\mathrm{xy}_0)) \text{ or } \forall \mathrm{xp}_0\colon a \to a \to$
$\$o\colon ((\forall \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon ((s@\mathrm{xx}_1@\mathrm{xy}_1) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_1@\mathrm{xy}_1)) \text{ and } p@\mathrm{xp}_0) \Rightarrow (\mathrm{xp}_0@\mathrm{xx}_0@\mathrm{xy}_0))) \Rightarrow (\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } p@\mathrm{xp}) =$
$(\mathrm{xp@xx@xy})) \Rightarrow \forall \mathrm{xp}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon ((r@\mathrm{xx}_0@\mathrm{xy}_0 \text{ or } s@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow (\mathrm{xp@xx}_0@\mathrm{xy}_0)) \text{ and } p@\mathrm{xp}) \Rightarrow$
$(\mathrm{xp@xx@xy})))$ thf(cTHM252A_pme, conjecture)

SEV128^5.p TPS problem from SETS-OF-RELNS-THMS
a: \$tType thf(a_type, type)
$\forall s\colon (a \to a \to \$o) \to \$o, \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon (\forall \mathrm{xp}_1\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to a \to \$o\colon (\exists q\colon a \to a \to$
$\$o\colon (s@q \text{ and } r = (\lambda \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon \forall \mathrm{xp}_{10}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_2\colon a, \mathrm{xy}_2\colon a\colon ((q@\mathrm{xx}_2@\mathrm{xy}_2) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}_2@\mathrm{xy}_2)) \text{ and } \forall \mathrm{xx}_2\colon a, \mathrm{xy}_2$
$(\mathrm{xp}_{10}@\mathrm{xx}_2@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}_1@\mathrm{xy}_1)))) \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow (\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xy}_0)) \text{ and } \forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a, \mathrm{xz}\colon a\colon ((\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xy}_0 \text{ a}$
$(\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_1@\mathrm{xx@xy})) \Rightarrow \forall \mathrm{xp}_1\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to a \to \$o\colon (s@r \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow$
$(\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xy}_0)) \text{ and } \forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a, \mathrm{xz}\colon a\colon ((\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xy}_0 \text{ and } \mathrm{xp}_1@\mathrm{xy}_0@\mathrm{xz}) \Rightarrow (\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_1@\mathrm{xx@xy}))) \quad \mathrm{t}$

SEV129^5.p TPS problem from SETS-OF-RELNS-THMS
a: \$tType thf(a_type, type)
$\forall s\colon (a \to a \to \$o) \to \$o, \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon (\forall \mathrm{xp}_1\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to a \to \$o\colon (s@r \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow$
$(\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xy}_0)) \text{ and } \forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a, \mathrm{xz}\colon a\colon ((\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xy}_0 \text{ and } \mathrm{xp}_1@\mathrm{xy}_0@\mathrm{xz}) \Rightarrow (\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_1@\mathrm{xx@xy})) \Rightarrow$
$\forall \mathrm{xp}_1\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon (\exists r\colon a \to a \to \$o\colon (\exists q\colon a \to a \to \$o\colon (s@q \text{ and } r = (\lambda \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon \forall \mathrm{xp}_{10}\colon a \to$
$a \to \$o\colon ((\forall \mathrm{xx}_2\colon a, \mathrm{xy}_2\colon a\colon ((q@\mathrm{xx}_2@\mathrm{xy}_2) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}_2@\mathrm{xy}_2)) \text{ and } \forall \mathrm{xx}_2\colon a, \mathrm{xy}_2\colon a, \mathrm{xz}\colon a\colon ((\mathrm{xp}_{10}@\mathrm{xx}_2@\mathrm{xy}_2 \text{ and } \mathrm{xp}_{10}@\mathrm{xy}_2@\mathrm{xz})$
$(\mathrm{xp}_{10}@\mathrm{xx}_2@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}_1@\mathrm{xy}_1)))) \text{ and } r@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow (\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xy}_0)) \text{ and } \forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a, \mathrm{xz}\colon a\colon ((\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xy}_0 \text{ a}$
$(\mathrm{xp}_1@\mathrm{xx}_0@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_1@\mathrm{xx@xy})))$ thf(cTHM253_A_pme, conjecture)

SEV130^5.p TPS problem from SETS-OF-RELNS-THMS
a: \$tType thf(a_type, type)
$\forall s\colon (a \to a \to \$o) \to \$o\colon (\lambda \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon \forall \mathrm{xp}_1\colon a \to a \to \$o\colon ((\forall \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon (\exists r\colon a \to a \to \$o\colon (s@r \text{ and } r@\mathrm{xx@xy}) \Rightarrow$
$(\mathrm{xp}_1@\mathrm{xx@xy})) \text{ and } \forall \mathrm{xx}\colon a, \mathrm{xy}\colon a, \mathrm{xz}\colon a\colon ((\mathrm{xp}_1@\mathrm{xx@xy} \text{ and } \mathrm{xp}_1@\mathrm{xy@xz}) \Rightarrow (\mathrm{xp}_1@\mathrm{xx@xz}))) \Rightarrow (\mathrm{xp}_1@\mathrm{xx}_1@\mathrm{xy}_1))) =$
$(\lambda \mathrm{xx}_1\colon a, \mathrm{xy}_1\colon a\colon \forall \mathrm{xp}_1\colon a \to a \to \$o\colon ((\forall \mathrm{xx}\colon a, \mathrm{xy}\colon a\colon (\exists r\colon a \to a \to \$o\colon (\exists q\colon a \to a \to \$o\colon (s@q \text{ and } r =$
$(\lambda \mathrm{xx}_{10}\colon a, \mathrm{xy}_{10}\colon a\colon \forall \mathrm{xp}_{10}\colon a \to a \to \$o\colon ((\forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a\colon ((q@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}_0@\mathrm{xy}_0)) \text{ and } \forall \mathrm{xx}_0\colon a, \mathrm{xy}_0\colon a, \mathrm{xz}\colon a\colon ((\mathrm{xp}_{10}$
$(\mathrm{xp}_{10}@\mathrm{xx}_0@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}_{10}@\mathrm{xy}_{10})))) \text{ and } r@\mathrm{xx@xy}) \Rightarrow (\mathrm{xp}_1@\mathrm{xx@xy})) \text{ and } \forall \mathrm{xx}\colon a, \mathrm{xy}\colon a, \mathrm{xz}\colon a\colon ((\mathrm{xp}_1@\mathrm{xx@xy} \text{ and } \mathrm{xp}_1$
$(\mathrm{xp}_1@\mathrm{xx@xz}))) \Rightarrow (\mathrm{xp}_1@\mathrm{xx}_1@\mathrm{xy}_1)))$ thf(cTHM253_pme, conjecture)

SEV131^5.p TPS problem THM202
a: \$tType thf(a_type, type)

$\forall$xr: $a \to a \to$ \$o, xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$ $\forall$xx$_0$: $a \to$ \$o: ($\forall$xy$_0$: a, xz: a: ((xr@xy$_0$@xz and xx$_0$@xy$_0$) $\Rightarrow$ (xx$_0$@xz)) $\Rightarrow$ ((xx$_0$@xx) $\Rightarrow$ (xx$_0$@xy)))) thf(cTHM202_pme, conjecture)

SEV132^5.p TPS problem from TC-THMS
a: \$tType thf(a_type, type)
$\forall$xr: $a \to a \to$ \$o, xs: a, xt: a: ((xs $\neq$ xt and $\forall$xx: $a \to$ \$o: ($\forall$xy: a, xz: a: ((xr@xy@xz and xx@xy) $\Rightarrow$ (xx@xz)) $\Rightarrow$ ((xx@xs) $\Rightarrow$ (xx@xt)))) $\Rightarrow$ $\exists$xc: a: (xr@xs@xc and $\forall$xx: $a \to$ \$o: ($\forall$xy: a, xz: a: ((xr@xy@xz and xx@xy) $\Rightarrow$ (xx@xz)) $\Rightarrow$ ((xx@xc) $\Rightarrow$ (xx@xt))))) thf(cTC_INTERP_BBP_OLD_pme, conjecture)

SEV133^5.p TPS problem from TC-THMS
atype: \$tType thf(a_type, type)
a: atype thf(a, type)
b: atype thf(b, type)
cSTAR: (atype $\to$ atype $\to$ \$o) $\to$ atype $\to$ atype $\to$ \$o thf(cSTAR, type)
$\forall$xr: atype $\to$ atype $\to$ \$o: (($\forall$xx: atype $\to$ \$o: ($\forall$xy: atype, xz: atype: ((xr@xy@xz and xx@xy) $\Rightarrow$ (xx@xz)) $\iff$ $\forall$xy: atype, xz: atype: ((xr@xy@xz and xx@xy) $\Rightarrow$ (xx@xz))) and $\forall$xa$_0$: atype, xb$_0$: atype: ((cSTAR@xr@xa$_0$@xb$_0$) $\iff$ $\forall$xx: atype $\to$ \$o: ($\forall$xy: atype, xz: atype: ((xr@xy@xz and xx@xy) $\Rightarrow$ (xx@xz)) $\Rightarrow$ ((xx@xa$_0$) $\Rightarrow$ (xx@xb$_0$)))) and $a \neq b$ and cSTAR@xr@a@b) $\Rightarrow$ $\exists$xc: atype: (xr@a@xc and cSTAR@xr@xc@b)) thf(cTC_INTERP_THIRD_pme, conjecture)

SEV134^5.p TPS problem THM201
a: \$tType thf(a_type, type)
$\forall$xr: $a \to a \to$ \$o, xx: a, xx$_0$: $a \to$ \$o: ($\forall$xy: a, xz: a: ((xr@xy@xz and xx$_0$@xy) $\Rightarrow$ (xx$_0$@xz)) $\Rightarrow$ ((xx$_0$@xx) $\Rightarrow$ (xx$_0$@xx))) thf(cTHM201_pme, conjecture)

SEV135^5.p TPS problem THM151
a: \$tType thf(a_type, type)
$\forall$xr: $a \to a \to$ \$o, xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$ $\forall$xq: $a \to$ \$o: (($\forall$xw: a: ((xr@xx@xw) $\Rightarrow$ (xq@xw)) and $\forall$xu: a, xv: a: ((xq@x (xq@xv))) $\Rightarrow$ (xq@xy))) thf(cTHM151_pme, conjecture)

SEV136^5.p TPS problem THM203
B&B-P's defn of TRCL is the minimal transitive reflexive relation containing r.
a: \$tType thf(a_type, type)
$\forall$xr: $a \to a \to$ \$o, t: ($a \to a \to$ \$o) $\to a \to a \to$ \$o: (($\forall$xx: a: (t@xr@xx@xx) and $\forall$xx: a, xy: a, xz: a: ((t@xr@xx@xy and t@xr@ (t@xr@xx@xz)) and $\forall$xx: a, xy: a: ((xr@xx@xy) $\Rightarrow$ (t@xr@xx@xy))) $\Rightarrow$ $\forall$xx: a, xy: a: ($\forall$xx$_0$: $a \to$ \$o: ($\forall$xy$_0$: a, xz: a: ((xr@xy (xx$_0$@xz)) $\Rightarrow$ ((xx$_0$@xx) $\Rightarrow$ (xx$_0$@xy))) $\Rightarrow$ (t@xr@xx@xy))) thf(cTHM203_pme, conjecture)

SEV137^5.p TPS problem THM204
a: \$tType thf(a_type, type)
$\forall$xr: $a \to a \to$ \$o, xx: a, xy: a, xz: a: (($\forall$xx$_0$: $a \to$ \$o: ($\forall$xy$_0$: a, xz$_0$: a: ((xr@xy$_0$@xz$_0$ and xx$_0$@xy$_0$) $\Rightarrow$ (xx$_0$@xz$_0$)) $\Rightarrow$ ((xx$_0$@xx) $\Rightarrow$ (xx$_0$@xy))) and $\forall$xx$_0$: $a \to$ \$o: ($\forall$xy$_0$: a, xz$_0$: a: ((xr@xy$_0$@xz$_0$ and xx$_0$@xy$_0$) $\Rightarrow$ (xx$_0$@xz$_0$)) $\Rightarrow$ ((xx$_0$@xy) $\Rightarrow$ (xx$_0$@xz)))) $\Rightarrow$ $\forall$xx$_0$: $a \to$ \$o: ($\forall$xy$_0$: a, xz$_0$: a: ((xr@xy$_0$@xz$_0$ and xx$_0$@xy$_0$) $\Rightarrow$ (xx$_0$@xz$_0$)) $\Rightarrow$ ((xx$_0$@xx) $\Rightarrow$ (xx$_0$@xz)))) thf(cTHM204_pme, conjecture)

SEV138^5.p TPS problem THM150
The transitive closure TC2 of a relation is transitive.
a: \$tType thf(a_type, type)
$\forall$xr: $a \to a \to$ \$o, xx: a, xy: a, xz: a: (($\forall$xq: $a \to$ \$o: (($\forall$xw: a: ((xr@xx@xw) $\Rightarrow$ (xq@xw)) and $\forall$xu: a, xv: a: ((xq@xu and xr@ (xq@xv))) $\Rightarrow$ (xq@xy)) and $\forall$xq: $a \to$ \$o: (($\forall$xw: a: ((xr@xy@xw) $\Rightarrow$ (xq@xw)) and $\forall$xu: a, xv: a: ((xq@xu and xr@xu@xv) (xq@xv))) $\Rightarrow$ (xq@xz))) $\Rightarrow$ $\forall$xq: $a \to$ \$o: (($\forall$xw: a: ((xr@xx@xw) $\Rightarrow$ (xq@xw)) and $\forall$xu: a, xv: a: ((xq@xu and xr@xu@xv) (xq@xv))) $\Rightarrow$ (xq@xz))) thf(cTHM150_pme, conjecture)

SEV140^5.p TPS problem THM250C
a: \$tType thf(a_type, type)
$\forall r$: $a \to a \to$ \$o, s: $a \to a \to$ \$o, xx: a, xy: a: ($\forall$xp$_1$: $a \to a \to$ \$o: (($\forall$xx$_0$: a, xy$_0$: a: (($\forall$xp$_{10}$: $a \to a \to$ \$o: (($\forall$xx$_1$: a, xy$_1$: a: ((r@xx$_1$@xy$_1$) $\Rightarrow$ (xp$_{10}$@xx$_1$@xy$_1$)) and $\forall$xx$_1$: a, xy$_1$: a, xz: a: ((xp$_{10}$@xx$_1$@xy$_1$ and xp$_{10}$@xy$_1$@xz) $\Rightarrow$ (xp$_{10}$@xx$_1$@xz))) $\Rightarrow$ (xp$_{10}$@xx$_0$@xy$_0$)) or $\forall$xp$_{10}$: $a \to a \to$ \$o: (($\forall$xx$_1$: a, xy$_1$: a: ((s@xx$_1$@xy$_1$) $\Rightarrow$ (xp$_{10}$@xx$_1$@xy$_1$)) and $\forall$x (xp$_{10}$@xx$_1$@xz))) $\Rightarrow$ (xp$_{10}$@xx$_0$@xy$_0$))) $\Rightarrow$ (xp$_1$@xx$_0$@xy$_0$)) and $\forall$xx$_0$: a, xy$_0$: a, xz: a: ((xp$_1$@xx$_0$@xy$_0$ and xp$_1$@xy$_0$@xz) = (xp$_1$@xx$_0$@xz))) $\Rightarrow$ (xp$_1$@xx@xy)) $\Rightarrow$ $\forall$xp$_1$: $a \to a \to$ \$o: (($\forall$xx$_0$: a, xy$_0$: a: ((r@xx$_0$@xy$_0$ or s@xx$_0$@xy$_0$) $\Rightarrow$ (xp$_1$@xx$_0$@xy$_0$)) and $\forall$xx$_0$: a, xy$_0$: a, xz: a: ((xp$_1$@xx$_0$@xy$_0$ and xp$_1$@xy$_0$@xz) $\Rightarrow$ (xp$_1$@xx$_0$@xz))) $\Rightarrow$ (xp$_1$@xx@xy))) t

SEV141^5.p TPS problem THM250
a: \$tType thf(a_type, type)
$\forall r$: $a \to a \to$ \$o, s: $a \to a \to$ \$o: (λxx$_1$: a, xy$_1$: a: $\forall$xp$_1$: $a \to a \to$ \$o: (($\forall$xx: a, xy: a: ((r@xx@xy or s@xx@xy) $\Rightarrow$ (xp$_1$@xx@xy)) and $\forall$xx: a, xy: a, xz: a: ((xp$_1$@xx@xy and xp$_1$@xy@xz) $\Rightarrow$ (xp$_1$@xx@xz))) $\Rightarrow$ (xp$_1$@xx$_1$@xy$_1$))) = (λxx$_1$: a, xy$_1$: a: $\forall$xp$_1$: $a \to a \to$ \$o: (($\forall$xx: a, xy: a: (($\forall$xp$_{10}$: $a \to a \to$ \$o: (($\forall$xx$_0$: a, xy$_0$: a: ((r@xx$_0$@xy$_0$) $\Rightarrow$

$(\mathrm{xp}_{10}@\mathrm{xx}_0@\mathrm{xy}_0))$ and $\forall \mathrm{xx}_0$: a, xy_0: a, xz: a: $((\mathrm{xp}_{10}@\mathrm{xx}_0@\mathrm{xy}_0$ and $\mathrm{xp}_{10}@\mathrm{xy}_0@\mathrm{xz}) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}_0@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}@\mathrm{xy}))$ o
$a \to \$o$: $((\forall \mathrm{xx}_0$: a, xy_0: a: $((s@\mathrm{xx}_0@\mathrm{xy}_0) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}_0@\mathrm{xy}_0))$ and $\forall \mathrm{xx}_0$: a, xy_0: a, xz: a: $((\mathrm{xp}_{10}@\mathrm{xx}_0@\mathrm{xy}_0$ and $\mathrm{xp}_{10}@\mathrm{xy}_0@\mathrm{xz})$
$(\mathrm{xp}_{10}@\mathrm{xx}_0@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_{10}@\mathrm{xx}@\mathrm{xy}))) \Rightarrow (\mathrm{xp}_1@\mathrm{xx}@\mathrm{xy}))$ and $\forall \mathrm{xx}$: a, xy: a, xz: a: $((\mathrm{xp}_1@\mathrm{xx}@\mathrm{xy}$ and $\mathrm{xp}_1@\mathrm{xy}@\mathrm{xz}) \Rightarrow$
$(\mathrm{xp}_1@\mathrm{xx}@\mathrm{xz}))) \Rightarrow (\mathrm{xp}_1@\mathrm{xx}_1@\mathrm{xy}_1)))$ thf(cTHM250_pme, conjecture)

SEV143^5.p TPS problem THM146
Equivalence of two definitions of transitive closure.
cTCLOSED: ($i → $i → $o) → ($i → $i → $o) → $o thf(cTCLOSED_type, type)
cTCLOSED = (λxp: $i → $i → $o, xs: $i → $i → $o: $\forall$xu: $i, xv: $i, xw: $i: ((xp@xu@xv and xs@xv@xw) ⇒
(xp@xu@xw))) thf(cTCLOSED_def, definition)
$\forall$xr: $i → $i → $o, xx: $i, xy: $i: ($\forall$xp: $i → $i → $o: (($\forall \mathrm{xx}_0$: $i, xy_0: $i: ((xr@$\mathrm{xx}_0$@$\mathrm{xy}_0$) ⇒ (xp@$\mathrm{xx}_0$@$\mathrm{xy}_0$)) and cTCLOSED@
(xp@xx@xy)) ⟺ $\forall$xp: $i → $i → $o: (($\forall \mathrm{xx}_0$: $i, xy_0: $i: ((xr@$\mathrm{xx}_0$@$\mathrm{xy}_0$) ⇒ (xp@$\mathrm{xx}_0$@$\mathrm{xy}_0$)) and $\forall \mathrm{xx}_0$: $i, xy_0: $i, xz: $i: ((x
(xp@xx_0@xz))) ⇒ (xp@xx@xy))) thf(cTHM146_pme, conjecture)

SEV144^5.p TPS problem from TRANSITIVE-CLOSURE
cTCLOSED: ($i → $i → $o) → ($i → $i → $o) → $o thf(cTCLOSED_type, type)
cTCLOSED = (λxp: $i → $i → $o, xs: $i → $i → $o: $\forall$xu: $i, xv: $i, xw: $i: ((xp@xu@xv and xs@xv@xw) ⇒
(xp@xu@xw))) thf(cTCLOSED_def, definition)
$\forall$xr: $i → $i → $o, xx: $i, xy: $i: ($\forall$xp: $i → $i → $o: (($\forall \mathrm{xx}_0$: $i, xy_0: $i: ((xr@$\mathrm{xx}_0$@$\mathrm{xy}_0$) ⇒ (xp@$\mathrm{xx}_0$@$\mathrm{xy}_0$)) and cTCLOSED@
(xp@xx@xy)) ⟺ $\forall$xp: $i → $i → $o: (($\forall \mathrm{xx}_0$: $i, xy_0: $i: ((xr@$\mathrm{xx}_0$@$\mathrm{xy}_0$) ⇒ (xp@$\mathrm{xx}_0$@$\mathrm{xy}_0$)) and cTCLOSED@xp@xp) ⇒
(xp@xx@xy))) thf(cTHM146B_pme, conjecture)

SEV146^5.p TPS problem from TRANSITIVE-CLOSURE
a: $tType thf(a_type, type)
$\forall$xr: $a \to a \to$ $o: ($\forall$xx: a, xy: a: ((xr@xx@xy) ⇒ $\forall$xq: $a \to$ $o: (($\forall$xw: a: ((xr@xx@xw) ⇒ (xq@xw)) and $\forall$xv: a, xw: a: ((xq@
(xq@xw))) ⇒ (xq@xy))) and $\forall$xx: a, xy: a, xz: a: (($\forall$xq: $a \to$ $o: (($\forall$xw: a: ((xr@xx@xw) ⇒ (xq@xw)) and $\forall$xv: a, xw: a: ((x
(xq@xw))) ⇒ (xq@xy)) and $\forall$xq: $a \to$ $o: (($\forall$xw: a: ((xr@xy@xw) ⇒ (xq@xw)) and $\forall$xv: a, xw: a: ((xq@xv and xr@xv@xw
(xq@xw))) ⇒ (xq@xz))) ⇒ $\forall$xq: $a \to$ $o: (($\forall$xw: a: ((xr@xx@xw) ⇒ (xq@xw)) and $\forall$xv: a, xw: a: ((xq@xv and xr@xv@xw
(xq@xw))) ⇒ (xq@xz)))) thf(cTHM525_pme, conjecture)

SEV148^5.p TPS problem from TRANSITIVE-CLOSURE
a: $tType thf(a_type, type)
$\forall r$: $a \to a \to$ o, s: $a \to a \to$ o, xx: a, xy: a: ($\forall$xq: $a \to$ $o: (($\forall$xw: a: (($\forall \mathrm{xq}_0$: $a \to$ $o: (($\forall \mathrm{xw}_0$: a: ((r@xx@xw_0) ⇒
(xq_0@xw_0)) and $\forall$xu: a, xv: a: ((xq_0@xu and r@xu@xv) ⇒ (xq_0@xv))) ⇒ (xq_0@xw)) or $\forall \mathrm{xq}_0$: $a \to$ $o: (($\forall \mathrm{xw}_0$: a: ((s@xx@
(xq_0@xw_0)) and $\forall$xu: a, xv: a: ((xq_0@xu and s@xu@xv) ⇒ (xq_0@xv))) ⇒ (xq_0@xw))) ⇒ (xq@xw)) and $\forall$xu: a, xv: a: ((xq
$o: (($\forall$xw: a: ((r@xu@xw) ⇒ (xq_0@xw)) and $\forall \mathrm{xu}_0$: a, xv_0: a: ((xq_0@xu_0 and r@xu_0@xv_0) ⇒ (xq_0@xv_0))) ⇒
(xq_0@xv)) or $\forall \mathrm{xq}_0$: $a \to$ $o: (($\forall$xw: a: ((s@xu@xw) ⇒ (xq_0@xw)) and $\forall \mathrm{xu}_0$: a, xv_0: a: ((xq_0@xu_0 and s@xu_0@xv_0) ⇒
(xq_0@xv_0))) ⇒ (xq_0@xv)))) ⇒ (xq@xv))) ⇒ (xq@xy)) ⇒ $\forall$xq: $a \to$ $o: (($\forall$xw: a: ((r@xx@xw or s@xx@xw) ⇒
(xq@xw)) and $\forall$xu: a, xv: a: ((xq@xu and (r@xu@xv or s@xu@xv)) ⇒ (xq@xv))) ⇒ (xq@xy))) thf(cTHM251C_pme, co

SEV149^5.p TPS problem from TRANSITIVE-CLOSURE
a: $tType thf(a_type, type)
$\forall r$: $a \to a \to$ o, s: $a \to a \to$ o, xx: a, xy: a: ($\forall$xq: $a \to$ $o: (($\forall$xw: a: ((r@xx@xw or s@xx@xw) ⇒ (xq@xw)) and $\forall$xu: a, xv:
(xq@xv))) ⇒ (xq@xy)) ⇒ $\forall$xq: $a \to$ $o: (($\forall$xw: a: (($\forall \mathrm{xq}_0$: $a \to$ $o: (($\forall \mathrm{xw}_0$: a: ((r@xx@xw_0) ⇒ (xq_0@xw_0)) and $\forall$xu: a, xv:
(xq_0@xv))) ⇒ (xq_0@xw)) or $\forall \mathrm{xq}_0$: $a \to$ $o: (($\forall \mathrm{xw}_0$: a: ((s@xx@xw_0) ⇒ (xq_0@xw_0)) and $\forall$xu: a, xv: a: ((xq_0@xu and s@xu@
(xq_0@xv))) ⇒ (xq_0@xw))) ⇒ (xq@xw)) and $\forall$xu: a, xv: a: ((xq@xu and ($\forall \mathrm{xq}_0$: $a \to$ $o: (($\forall$xw: a: ((r@xu@xw) ⇒
(xq_0@xw)) and $\forall \mathrm{xu}_0$: a, xv_0: a: ((xq_0@xu_0 and r@xu_0@xv_0) ⇒ (xq_0@xv_0))) ⇒ (xq_0@xv)) or $\forall \mathrm{xq}_0$: $a \to$ $o: (($\forall$xw: a: ((s@x
(xq_0@xw)) and $\forall \mathrm{xu}_0$: a, xv_0: a: ((xq_0@xu_0 and s@xu_0@xv_0) ⇒ (xq_0@xv_0))) ⇒ (xq_0@xv)))) ⇒ (xq@xv))) ⇒
(xq@xy))) thf(cTHM251B_pme, conjecture)

SEV150^5.p TPS problem from TRANSITIVE-CLOSURE
a: $tType thf(a_type, type)
$\forall r$: $a \to a \to$ o, s: $a \to a \to$ $o: ($\lambda$xp: a, xq: a: $\forall \mathrm{xq}_0$: $a \to$ $o: (($\forall$xw: a: ((r@xp@xw or s@xp@xw) ⇒
(xq_0@xw)) and $\forall$xu: a, xv: a: ((xq_0@xu and (r@xu@xv or s@xu@xv)) ⇒ (xq_0@xv))) ⇒ (xq_0@xq))) = (λxp: a, xq: a: $\forall \mathrm{xq}_0$:
$o: (($\forall$xw: a: (($\forall \mathrm{xq}_1$: $a \to$ $o: (($\forall \mathrm{xw}_0$: a: ((r@xp@xw_0) ⇒ (xq_1@xw_0)) and $\forall$xu: a, xv: a: ((xq_1@xu and r@xu@xv) ⇒
(xq_1@xv))) ⇒ (xq_1@xw)) or $\forall \mathrm{xq}_1$: $a \to$ $o: (($\forall \mathrm{xw}_0$: a: ((s@xp@xw_0) ⇒ (xq_1@xw_0)) and $\forall$xu: a, xv: a: ((xq_1@xu and s@xu@
(xq_1@xv))) ⇒ (xq_1@xw))) ⇒ (xq_0@xw)) and $\forall$xu: a, xv: a: ((xq_0@xu and ($\forall \mathrm{xq}_1$: $a \to$ $o: (($\forall$xw: a: ((r@xu@xw) ⇒
(xq_1@xw)) and $\forall \mathrm{xu}_0$: a, xv_0: a: ((xq_1@xu_0 and r@xu_0@xv_0) ⇒ (xq_1@xv_0))) ⇒ (xq_1@xv)) or $\forall \mathrm{xq}_1$: $a \to$ $o: (($\forall$xw: a: ((s@x
(xq_1@xw)) and $\forall \mathrm{xu}_0$: a, xv_0: a: ((xq_1@xu_0 and s@xu_0@xv_0) ⇒ (xq_1@xv_0))) ⇒ (xq_1@xv)))) ⇒ (xq_0@xv))) ⇒
(xq_0@xq))) thf(cTHM251A_pme, conjecture)

SEV158^5.p TPS problem THM120I-1

$\exists r$: ($i → $o) → ($i → $o) → $o: (∀xx: $i → $o: ($r$@xx@xx) and ∀xx: $i → $o, xy: $i → $o, xz: $i → $o: (($r$@xx@xy and r@xy@xz) ⇒ (r@xx@xz)) and ∀x: $i → $o, y: $i → $o: (($r$@$x$@$y$ and r@y@x) ⇒ ∀xx: $i: ($x$@xx) = ($y$@xx))) thf(cTHM120I_1_pme, conjecture)

SEV159^5.p TPS problem THM181
Basic theorem about pairing.
a: $tType thf(a_type, type)
∀xx: a, xy: a: xy = xy thf(cTHM181_pme, conjecture)

SEV160^5.p TPS problem THM186
Basic theorem about pairing.
a: $tType thf(a_type, type)
y: a thf(y, type)
x: a thf(x, type)
(λxg: a → a → a: (xg@x@y)) = (λxg: a → a → a: (xg@x@y)) thf(cTHM186_pme, conjecture)

SEV161^5.p TPS problem THM183
Basic theorem about pairing.
a: $tType thf(a_type, type)
∀xr: a → a → $o, xx: a, xy: a: ((xr@xx@xy) ⟺ (xr@xx@xy)) thf(cTHM183_pme, conjecture)

SEV162^5.p TPS problem THM184
Theorem about representing relations in terms of ordered pairs.
a: $tType thf(a_type, type)
∀xr: a → a → $o: (∀xx: a, xy: a: (xr@xx@xy) ⟺ ∀xp: (a → a → a) → a: (xr@(xp@λxx: a, xy: a: xx)@(xp@λxx: a, xy: a: xy

SEV163^5.p TPS problem THM187
Basic theorem about pairing.
a: $tType thf(a_type, type)
∀xp: (a → a → a) → a: (xp = (λxg: a → a → a: (xg@(xp@λxx: a, xy: a: xx)@(xp@λxx: a, xy: a: xy))) ⇒ (λxg: a → a → a: (xg@(xp@λxx: a, xy: a: xx)@(xp@λxx: a, xy: a: xy))) = xp) thf(cTHM187_pme, conjecture)

SEV164^5.p TPS problem THM185
Basic theorem about representing relations in terms of ordered pairs.
a: $tType thf(a_type, type)
∀xr: a → a → $o: (∃xx: a, xy: a: (xr@xx@xy) ⟺ ∃xp: (a → a → a) → a: (xr@(xp@λxx: a, xy: a: xx)@(xp@λxx: a, xy: a: xy

SEV165^5.p TPS problem EXISTS-CART-SET-PROD
∃cROSS: ($i → $o) → ($i → $o) → (($i → $i → $i) → $i) → $o: ∀$a$: $i → $o, b: $i → $o, xa: $i, xb: $i: ((cROSS@$a$@$b$@λ$g$: $i → $i → $i: ($g$@xa@xb)) ⟺ ($a$@xa and b@xb)) thf(cEXISTS_CART_SET_PROD_pme, conjecture)

SEV166^5.p TPS problem THM182
Basic theorem about pairing.
a: $tType thf(a_type, type)
∀xx: a, xy: a, xu: a, xv: a: ((λxg: a → a → a: (xg@xx@xy)) = (λxg: a → a → a: (xg@xu@xv)) ⟺ (xx = xu and xy = xv)) thf(cTHM182_pme, conjecture)

SEV167^5.p TPS problem THM189
Basic theorem about pairing.
a: $tType thf(a_type, type)
∀xr: a → a → a → a → $o: (∀xp: ($a$ → a → a) → a, xq: (a → a → a) → a: ((xr@(xp@λxx: a, xy: a: xx)@(xp@λxx: a, xy: a: xy
xp = xq) ⇒ ∀xx$_1$: a, xy$_1$: a, xx$_2$: a, xy$_2$: a: ((xr@xx$_1$@xy$_1$@xx$_2$@xy$_2$) ⇒ (xx$_1$ = xx$_2$ and xy$_1$ = xy$_2$))) thf(cTHM189_pme

SEV168^5.p TPS problem from PAIRS-THMS
a: $tType thf(a_type, type)
q: (a → a → a) → a thf(q, type)
p: (a → a → a) → a thf(p, type)
(q = (λxg: a → a → a: (xg@(q@λxx: a, xy: a: xx)@(q@λxx: a, xy: a: xy))) and p = (λxg: a → a → a: (xg@(q@λxx: a, xy: a: xx
p = q thf(cTHM188_PARTIAL_pme, conjecture)

SEV169^5.p TPS problem from PAIRS-THMS
a: $tType thf(a_type, type)
∀xp: (a → a → a) → a, xq: (a → a → a) → a: ((xp = (λxg: a → a → a: (xg@(xp@λxx: a, xy: a: xx)@(xp@λxx: a, xy: a: xy))) a
(λxg: a → a → a: (xg@(xq@λxx: a, xy: a: xx)@(xq@λxx: a, xy: a: xy))) and (xp@λxx: a, xy: a: xx) = (xq@λxx: a, xy: a: xx) a
(xq@λxx: a, xy: a: xy)) ⇒ xp = xq) thf(cTHM188_pme, conjecture)

SEV170^5.p TPS problem from PAIRS-THMS

a: \$tType thf(a_type, type)
$\forall xr\colon a \to a \to a \to a \to \$o\colon (\forall xp\colon (a \to a \to a) \to a, xq\colon (a \to a \to a) \to a\colon ((xp = (\lambda xg\colon a \to a \to a\colon (xg@(xp@\lambda xx\colon a, xy\colon a\colon xx)@(xp@\lambda xx\colon a, xy\colon a\colon xy))))$ and $xq = (\lambda xg\colon a \to a \to a\colon (xg@(xq@\lambda xx\colon a, xy\colon a\colon xx)@(xq@\lambda xx\colon a,$
$xp = xq) \iff \forall xx_1\colon a, xy_1\colon a, xx_2\colon a, xy_2\colon a\colon ((xr@xx_1@xy_1@xx_2@xy_2) \Rightarrow (xx_1 = xx_2$ and $xy_1 = xy_2)))$ thf(cTHM190_p

SEV171∧5.p TPS problem from PAIRS-FUNS-THMS
a: \$tType thf(a_type, type)
$\exists f\colon a \to (a \to a \to a) \to a\colon (\forall xx\colon a, xy\colon a\colon ((f@xx) = (f@xy) \Rightarrow xx = xy)$ and $\forall x\colon a\colon \exists y\colon a, z\colon a\colon (f@x) = (\lambda g\colon a \to$
$a \to a\colon (g@x@y)))$ thf(cTHM33_pme, conjecture)

SEV172∧5.p TPS problem from SETPAIRS-THMS
b: \$tType thf(b_type, type)
cZ: $b \to \$o$ thf(cZ, type)
cR: $b \to \$o$ thf(cR, type)
cS: $b \to \$o$ thf(cS, type)
$\forall xx\colon (b \to b \to b) \to b\colon (\exists x\colon b, y\colon b\colon ((cR@x$ or $cS@x)$ and $(cR@y$ or $cS@y)$ and $xx = (\lambda g\colon b \to b \to b\colon (g@x@y))) \Rightarrow$
$\exists x\colon b, y\colon b\colon ((cR@x$ or $cZ@x)$ and $(cR@y$ or $cZ@y)$ and $xx = (\lambda g\colon b \to b \to b\colon (g@x@y))))$ thf(cTHM32A_pme, conjecture)

SEV173∧5.p TPS problem from SETPAIRS-THMS
b: \$tType thf(b_type, type)
cZ: $b \to \$o$ thf(cZ, type)
cR: $b \to \$o$ thf(cR, type)
cS: $b \to \$o$ thf(cS, type)
$\forall xx\colon (b \to b \to b) \to b\colon (\exists x\colon b, y\colon b\colon ((cR@x$ or $cS@x)$ and $(cR@y$ or $cS@y)$ and $xx = (\lambda g\colon b \to b \to b\colon (g@x@y))) \iff$
$\exists x\colon b, y\colon b\colon ((cR@x$ or $cZ@x)$ and $(cR@y$ or $cZ@y)$ and $xx = (\lambda g\colon b \to b \to b\colon (g@x@y))))$ thf(cTHM32_pme, conjecture)

SEV174∧5.p TPS problem from SETS-OF-SETS
a: \$tType thf(a_type, type)
cP: $(a \to \$o) \to \$o$ thf(cP, type)
$(\forall xp\colon a \to \$o\colon ((cP@xp) \Rightarrow \exists xz\colon a\colon (xp@xz))$ and $\forall xx\colon a, xp\colon a \to \$o, xq\colon a \to \$o\colon ((cP@xp$ and $cP@xq$ and $xp@xx$ and $xq@x$
$xp = xq)) \Rightarrow \exists s\colon a \to \$o\colon (\forall xa\colon a \to \$o\colon ((cP@xa) \Rightarrow \exists xx\colon a\colon (xa@xx))$ and $\forall xx\colon a\colon ((s@xx) \iff \exists s_0\colon a \to$
$\$o\colon (cP@s_0$ and $s_0@xx))$ and $\forall xb\colon a \to \$o, xc\colon a \to \$o\colon ((cP@xb$ and $cP@xc$ and $\exists xx\colon a\colon (xb@xx$ and $xc@xx)) \Rightarrow$
$xb = xc))$ thf(cTHM555_pme, conjecture)

SEV175∧5.p TPS problem THM144A
A lemma for the Injective Cantor Theorem X5309.
$\forall xh\colon (\$i \to \$o) \to \$i\colon \exists xt\colon \$i \to \$o\colon (\neg\, xt@(xh@xt)$ and $(xh@\lambda xz\colon \$i\colon \exists xt_0\colon \$i \to \$o\colon (\neg\, xt_0@(xh@xt_0)$ and $xz =$
$(xh@xt_0))) = (xh@xt))$ thf(cTHM144A_pme, conjecture)

SEV176∧5.p TPS problem THM25
Quine's modification of Russell's paradox.
cR: \$i → \$i → \$o thf(cR, type)
$\neg\, \exists y\colon \$i\colon \forall x\colon \$i\colon ((cR@x@y) \iff \neg\, \exists z\colon \$i\colon (cR@x@z$ and $cR@z@x))$ thf(cTHM$_{25}$, conjecture)

SEV177∧5.p TPS problem THM144
A lemma for the Injective Cantor Theorem X5309.
$\forall xh\colon (\$i \to \$o) \to \$i, xd\colon \$i \to \$o\colon (xd = (\lambda xz\colon \$i\colon \exists xt\colon \$i \to \$o\colon (\neg\, xt@(xh@xt)$ and $xz = (xh@xt))) \Rightarrow$
$(xd@(xh@xd)))$ thf(cTHM144_pme, conjecture)

SEV179∧5.p TPS problem from CANTOR-THMS
cD_FOR_X$_{5309}$: $((\$i \to \$o) \to \$i) \to \$i \to \$o$ thf(cD_FOR_X5309_type, type)
cD_FOR_X$_{5309} = (\lambda xh\colon (\$i \to \$o) \to \$i, xz\colon \$i\colon \exists xt\colon \$i \to \$o\colon (\neg\, xt@(xh@xt)$ and $xz = (xh@xt)))$ thf(cD_FOR_X5309_def, c
$\forall xh\colon (\$i \to \$o) \to \$i\colon (cD\_FOR\_X_{5309}@xh@(xh@(cD\_FOR\_X_{5309}@xh)))$ thf(cTHM144C_pme, conjecture)

SEV180∧5.p TPS problem from CANTOR-THMS
cF: \$i → \$o thf(cF, type)
cQ: $(\$i \to \$o) \to \$o$ thf(cQ, type)
cJ: $(\$i \to \$o) \to \$i$ thf(cJ, type)
cG: \$i → \$i → \$o thf(cG, type)
$\neg\, cQ@(cG@(cJ@cF))$ or $cQ@cF$ thf(cCANTOR_PROBLEM, conjecture)

SEV181∧5.p TPS problem from CANTOR-THMS
cD_FOR_X$_{5309}$: $((\$i \to \$o) \to \$i) \to \$i \to \$o$ thf(cD_FOR_X5309_type, type)
cD_FOR_X$_{5309} = (\lambda xh\colon (\$i \to \$o) \to \$i, xz\colon \$i\colon \exists xt\colon \$i \to \$o\colon (\neg\, xt@(xh@xt)$ and $xz = (xh@xt)))$ thf(cD_FOR_X5309_def, c
$\forall xh\colon (\$i \to \$o) \to \$i\colon (\forall xp\colon \$i \to \$o, xq\colon \$i \to \$o\colon ((xh@xp) = (xh@xq) \Rightarrow xp = xq) \Rightarrow \neg\, cD\_FOR\_X_{5309}@xh@(xh@(cD\_FOR$

SEV182^5.p TPS problem from CANTOR-THMS
$\forall s$: \$i → \$o: ¬ $\exists z$: \$i → \$o: (∀xx: \$i: ((z@xx) ⇒ (s@xx)) and ∃xs: (\$i → \$o) → \$i: (∀xx: \$i → \$o: (∀xx_0: \$i: ((xx@xx_0) ⇒ (s@xx_0)) ⇒ (z@(xs@xx))) and ∀xy: \$i: ((z@xy) ⇒ ∃xy_0: \$i → \$o: (λxx: \$i → \$o: (∀xx_0: \$i: ((xx@xx_0) ⇒ (s@xx_0)) and xy = (xs@xx))) = (λxx: \$i → \$o, xy: \$i → \$o: xx = xy@xy_0)))) thf(cTHM110_pme, conjecture)

SEV185^5.p TPS problem THM564
b: \$tType thf(b_type, type)
∀p: (b → \$o) → b → \$o, s: (b → \$o) → \$o: (∀xx: b → \$o: ((s@xx) ⇒ ∀x: b → \$o, xy: b: ((∀xx_0: b: ((x@xx_0) ⇒ (xx@xx_0)) and p@x@xy) ⇒ (xx@xy))) ⇒ ∀x: b → \$o, xy: b: ((∀xx: b: ((x@xx) ⇒ ∀s_0: b → \$o: ((s@s_0) ⇒ (s_0@xx))) and p@x@xy) ⇒ ∀s_0: b → \$o: ((s@s_0) ⇒ (s_0@xy)))) thf(cTHM564_pme, conjecture)

SEV186^5.p TPS problem THM565
b: \$tType thf(b_type, type)
∀p: (b → \$o) → (b → \$o) → \$o, s: (b → \$o) → \$o: (∀xx: b → \$o: ((s@xx) ⇒ ∀x: b → \$o, y: b → \$o: ((∀xx_0: b: ((x@xx_0) ⇒ (xx@xx_0)) and p@x@y) ⇒ ∀xx_0: b: ((y@xx_0) ⇒ (xx@xx_0)))) ⇒ ∀x: b → \$o, y: b → \$o: ((∀xx: b: ((x@xx) ⇒ ∀s_0: b → \$o: ((s@s_0) ⇒ (s_0@xx))) and p@x@y) ⇒ ∀xx: b: ((y@xx) ⇒ ∀s_0: b → \$o: ((s@s_0) ⇒ (s_0@xx))))) thf(cTHM565_pme, conjecture)

SEV187^5.p TPS problem from CLOS-SYS-THMS
a: \$tType thf(a_type, type)
b: \$tType thf(b_type, type)
c: \$tType thf(c_type, type)
∀s: (a → b → c → \$o) → \$o: (∀xx: a → b → c → \$o: ((s@xx) ⇒ \$true) ⇒ \$true) thf(cCS3_ALL_THM_pme, conjecture)

SEV188^5.p TPS problem from CLOS-SYS-THMS
a: \$tType thf(a_type, type)
b: \$tType thf(b_type, type)
∀s: (a → b → \$o) → \$o: (∀xx: a → b → \$o: ((s@xx) ⇒ \$true) ⇒ \$true) thf(cCS2_ALL_THM_pme, conjecture)

SEV189^5.p TPS problem from CLOS-SYS-THMS
b: \$tType thf(b_type, type)
cQ: (b → \$o) → \$o thf(cQ, type)
cP: (b → \$o) → \$o thf(cP, type)
(∀s: (b → \$o) → \$o: (∀xx: b → \$o: ((s@xx) ⇒ (cP@xx)) ⇒ (cP@λxx: b: ∀s_0: b → \$o: ((s@s_0) ⇒ (s_0@xx)))) and ∀s: (b → \$o) → \$o: (∀xx: b → \$o: ((s@xx) ⇒ (cQ@xx)) ⇒ (cQ@λxx: b: ∀s_0: b → \$o: ((s@s_0) ⇒ (s_0@xx))))) ⇒ ∀s: (b → \$o) → \$o: (∀xx: b → \$o: ((s@xx) ⇒ (cP@xx and cQ@xx)) ⇒ (cP@λxx: b: ∀s_0: b → \$o: ((s@s_0) ⇒ (s_0@xx)) and cQ@λxx: b: ∀s_0: b → \$o: ((s@s_0) ⇒ (s_0@xx)))) thf(cTHM567_pme, conjecture)

SEV190^5.p TPS problem THM580
The join (in the initial pairing algebra \$) of x and x is x.
iS: \$tType thf(iS_type, type)
c_0: iS thf(c0_type, type)
cJOIN: iS → iS → iS → \$o thf(cJOIN_type, type)
cP: iS → iS → iS thf(cP_type, type)
cS_JOIN_CLOS: iS → (iS → iS → iS) → (iS → iS → iS → \$o) → \$o thf(cS_JOIN_CLOS_type, type)
cS_JOIN_CLOS = (λx_0: iS, p: iS → iS → iS, jOIN: iS → iS → iS → \$o: (∀xx: iS: (jOIN@xx@x_0@xx) and ∀xy: iS: (jOIN@x_0@x
(jOIN@(p@xx@xu)@(p@xy@xv)@(p@xz@xw))))) thf(cS_JOIN_CLOS_def, definition)
(∀xx: iS, xy: iS: (cP@xx@xy) ≠ c_0 and ∀xx: iS, xy: iS, xu: iS, xv: iS: ((cP@xx@xu) = (cP@xy@xv) ⇒ (xx = xy and xu = xv)) and ∀x: iS → \$o: ((x@c_0 and ∀xx: iS, xy: iS: ((x@xx and x@xy) ⇒ (x@(cP@xx@xy)))) ⇒ ∀xx: iS: (x@xx)) and cS_JOIN_CLOS@c_0@cP@cJOIN) ⇒ ∀xx: iS: (cJOIN@xx@xx@xx) thf(cTHM580_pme, conjecture)

SEV191^5.p TPS problem S-JOINFN-MONOTONE
The function used to define JOIN as a LFP is monotone.
a: \$tType thf(a_type, type)
cP: a → a → a thf(cP, type)
c_0: a thf(c_0, type)
∀r: a → a → a → \$o: (\$true ⇒ \$true) and ∀r: a → a → a → \$o, s: a → a → a → \$o: ((\$true and \$true and ∀xa: a, xb: a, xc:
(s@xa@xb@xc))) ⇒ ∀xa: a, xb: a, xc: a: (((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or ∃xx_1: a, xx_2: a, xy_1: a, xy_2: a, x
(cP@xx_1@xx_2) and xb = (cP@xy_1@xy_2) and xc = (cP@xz_1@xz_2) and r@xx_1@xy_1@xz_1 and r@xx_2@xy_2@xz_2)) ⇒
((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or ∃xx_1: a, xx_2: a, xy_1: a, xy_2: a, xz_1: a, xz_2: a: (xa = (cP@xx_1@xx_2) and xb
(cP@xy_1@xy_2) and xc = (cP@xz_1@xz_2) and s@xx_1@xy_1@xz_1 and s@xx_2@xy_2@xz_2)))) thf(cS_JOINFN_MONOTONE_p

SEV193^5.p TPS problem from S-THMS
cT: (\$i → \$o) → \$o thf(cT, type)

$\forall s$: ($\mathrm{i} \to \mathrm{o}$) $\to$ o: ($\forall$xx: $\mathrm{i} \to \mathrm{o}$: (($s$@xx) $\Rightarrow$ (cT@xx)) $\Rightarrow$ (cT@λxx: i: $\exists s_0$: $\mathrm{i} \to \mathrm{o}$: ($s$@$s_0$ and s_0@xx))) $\Rightarrow$ $\forall u$: $\mathrm{i} \to \mathrm{o}$, v: $\mathrm{i} \to \mathrm{o}$: ((cT@$u$ and cT@v) $\Rightarrow$ (cT@λxz: i: (u@xz or v@xz))) thf(cTHM501_pme, conjecture)

SEV194^5.p TPS problem from S-THMS
a: tType thf(a_type, type)
x: a thf(x, type)
c_0: a thf(c_0, type)
cP: $a \to a \to a$ thf(cP, type)
$\forall r$: $a \to a \to a \to$ o: ((true and $\forall$xa: a, xb: a, xc: a: (((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or $\exists$xx$_1$: a, xx$_2$: a, xy$_1$
(cP@xx$_1$@xx$_2$) and xb = (cP@xy$_1$@xy$_2$) and xc = (cP@xz$_1$@xz$_2$) and r@xx$_1$@xy$_1$@xz$_1$ and r@xx$_2$@xy$_2$@xz$_2$)) $\Rightarrow$ (r@xa@xb@xc))) $\Rightarrow$ (r@c_0@x@x)) thf(cS_INCL_LEM2_pme, conjecture)

SEV195^5.p TPS problem from S-THMS
a: tType thf(a_type, type)
cP: $a \to a \to a$ thf(cP, type)
cZ: a thf(cZ, type)
($\forall$xx: a, xy: a: (cP@xx@xy) $\neq$ cZ and $\forall$xx: a, xy: a, xu: a, xv: a: ((cP@xx@xu) = (cP@xy@xv) $\Rightarrow$ (xx = xy and xu = xv)) and $\forall x$: $a \to$ o: ((x@cZ and $\forall$xx: a, xy: a: ((x@xx and x@xy) $\Rightarrow$ (x@(cP@xx@xy)))) $\Rightarrow$ $\forall$xx: a: (x@xx))) $\Rightarrow$ $\forall$xx: a: (xx = cZ or $\exists$xy: a, xz: a: xx = (cP@xy@xz)) thf(cS_LEM1D_pme, conjecture)

SEV196^5.p TPS problem from S-THMS
a: tType thf(a_type, type)
y: a thf(y, type)
x: a thf(x, type)
cP: $a \to a \to a$ thf(cP, type)
c_0: a thf(c_0, type)
$\forall r$: $a \to a \to a \to$ o: ((true and $\forall$xa: a, xb: a, xc: a: (((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or $\exists$xx$_1$: a, xx$_2$: a, xy$_1$
(cP@xx$_1$@xx$_2$) and xb = (cP@xy$_1$@xy$_2$) and xc = (cP@xz$_1$@xz$_2$) and r@xx$_1$@xy$_1$@xz$_1$ and r@xx$_2$@xy$_2$@xz$_2$)) $\Rightarrow$ (r@xa@xb@xc))) $\Rightarrow$ (r@(cP@x@c_0)@(cP@c_0@y)@(cP@x@y))) thf(cS_JOIN_LEM2_pme, conjecture)

SEV197^5.p TPS problem from S-THMS
iS: tType thf(iS_type, type)
c_0: iS thf(c_0, type)
cP: iS $\to$ iS $\to$ iS thf(cP, type)
($\forall$xx: iS, xy: iS: (cP@xx@xy) $\neq c_0$ and $\forall$xx: iS, xy: iS, xu: iS, xv: iS: ((cP@xx@xu) = (cP@xy@xv) $\Rightarrow$ (xx = xy and xu = xv)) and $\forall x$: iS $\to$ o: ((x@c_0 and $\forall$xx: iS, xy: iS: ((x@xx and x@xy) $\Rightarrow$ (x@(cP@xx@xy)))) $\Rightarrow$ $\forall$xx: iS: (x@xx))) $\Rightarrow$ ($\forall$xx: iS, xy: iS, xu: iS, xv: iS: ((cP@xx@xu) = (cP@xy@xv) $\Rightarrow$ (xx = xy and xu = xv)) and $\forall$xx: iS, xy: iS: (cP@xx@xy) $\neq c_0$) thf(cS_ALG02_pme, conjecture)

SEV198^5.p TPS problem from S-THMS
a: tType thf(a_type, type)
c_0: a thf(c_0, type)
x: a thf(x, type)
cP: $a \to a \to a$ thf(cP, type)
($\forall$xx$_0$: a, xy: a, xu: a, xv: a: ((cP@xx$_0$@xu) = (cP@xy@xv) $\Rightarrow$ (xx$_0$ = xy and xu = xv)) and $\forall$xx$_0$: a, xy: a: (cP@xx$_0$@xy) $\neq$ c_0) $\Rightarrow$ ($\forall r$: $a \to a \to a \to$ o: ((true and $\forall$xa: a, xb: a, xc: a: (((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or $\exists$xx$_1$: a, xx$_2$: a, xy$_1$: a, xy$_2$: a, xz$_1$: a, xz$_2$: a: (xa = (cP@xx$_1$@xx$_2$) and xb = (cP@xy$_1$@xy$_2$) and xc = (cP@xz$_1$@xz$_2$) and r@xx$_1$@xy$_1$@xz$_1$ and r@xx$_2$@xy$_2$@xz$_2$)) $\Rightarrow$ (r@xa@xb@xc))) $\Rightarrow$ (r@x@c_0@c_0)) $\Rightarrow$ x = c_0) thf(cS_INCL_LEM6_pme, conjecture)

SEV199^5.p TPS problem from S-THMS
iS: tType thf(iS_type, type)
x: iS thf(x, type)
cP: iS $\to$ iS $\to$ iS thf(cP, type)
c_0: iS thf(c_0, type)
($\forall$xx$_0$: iS, xy: iS: (cP@xx$_0$@xy) $\neq c_0$ and $\forall$xx$_0$: iS, xy: iS, xu: iS, xv: iS: ((cP@xx$_0$@xu) = (cP@xy@xv) $\Rightarrow$ (xx$_0$ = xy and xu = xv)) and $\forall x$: iS $\to$ o: ((x@c_0 and $\forall$xx$_0$: iS, xy: iS: ((x@xx$_0$ and x@xy) $\Rightarrow$ (x@(cP@xx$_0$@xy)))) $\Rightarrow$ $\forall$xx$_0$: iS: (x@xx$_0$))) $\Rightarrow$ $\forall r$: iS $\to$ iS $\to$ iS $\to$ o: ((true and $\forall$xa: iS, xb: iS, xc: iS: (((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or $\exists$xx$_1$: iS, xx$_2$: iS, xy$_1$: iS, xy$_2$: iS, xz$_1$: iS, xz$_2$: iS: (xa = (cP@xx$_1$@xx$_2$) and xb = (cP@xy$_1$@xy$_2$) and xc = (cP@xz$_1$@xz$_2$) and r@xx$_1$@xy$_1$@xz$_1$ and r@xx$_2$@xy$_2$@xz$_2$)) $\Rightarrow$ (r@xa@xb@xc))) $\Rightarrow$ (r@x@x@x)) thf(cS_INCL_LEM3_pme, conjecture)

SEV200^5.p TPS problem from S-THMS

a: \$tType thf(a_type, type)
x: a thf(x, type)
cZ: a thf(cZ, type)
cP: $a \to a \to a$ thf(cP, type)
($\forall$xx$_0$: a, xy: a: (cP@xx$_0$@xy) $\neq$ cZ and $\forall$xx$_0$: a, xy: a, xu: a, xv: a: ((cP@xx$_0$@xu) = (cP@xy@xv) $\Rightarrow$ (xx$_0$ = xy and xu = xv)) and $\forall x$: $a \to$ \$o: ((x@cZ and $\forall$xx$_0$: a, xy: a: ((x@xx$_0$ and x@xy) $\Rightarrow$ (x@(cP@xx$_0$@xy)))) $\Rightarrow$ $\forall$xx$_0$: a: (x@xx$_0$))) $\Rightarrow$ $\forall r$: $a \to a \to a \to$ \$o: ((\$true and $\forall$xa: a, xb: a, xc: a: (((xa = cZ and xb = xc) or (xb = cZ and xa = xc) or $\exists$xx$_1$: a, xx$_2$: a, xy$_1$: a, xy$_2$: a, xz$_1$: a, xz$_2$: a: (xa = (cP@xx$_1$@xx$_2$) and xb = (cP@xy$_1$@xy$_2$) and xc = (cP@xz$_1$@xz$_2$) and r@xx$_1$@xy$_1$@xz$_1$ and r@xx$_2$@xy$_2$@xz$_2$)) $\Rightarrow$ (r@xa@xb@xc))) $\Rightarrow$ (r@cZ@x@x)) thf(cS_LEM1C_pme

SEV203^5.p TPS problem from S-THMS
iS: \$tType thf(iS_type, type)
y: iS thf(y, type)
x: iS thf(x, type)
cP: iS $\to$ iS $\to$ iS thf(cP, type)
c_0: iS thf(c_0, type)
($\forall$xx$_0$: iS, xy$_0$: iS: (cP@xx$_0$@xy$_0$) $\neq$ c_0 and $\forall$xx$_0$: iS, xy$_0$: iS, xu: iS, xv: iS: ((cP@xx$_0$@xu) = (cP@xy$_0$@xv) $\Rightarrow$ (xx$_0$ = xy$_0$ and xu = xv)) and $\forall x$: iS $\to$ \$o: ((x@c_0 and $\forall$xx$_0$: iS, xy$_0$: iS: ((x@xx$_0$ and x@xy$_0$) $\Rightarrow$ (x@(cP@xx$_0$@xy$_0$)))) $\Rightarrow$ $\forall$xx$_0$: iS: (x@xx$_0$))) $\Rightarrow$ $\forall r$: iS $\to$ iS $\to$ iS $\to$ \$o: ((\$true and $\forall$xa: iS, xb: iS, xc: iS: (((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or $\exists$xx$_1$: iS, xx$_2$: iS, xy$_1$: iS, xy$_2$: iS, xz$_1$: iS, xz$_2$: iS: (xa = (cP@xx$_1$@xx$_2$) and xb = (cP@xy$_1$@xy$_2$) and xc = (cP@xz$_1$@xz$_2$) and r@xx$_1$@xy$_1$@xz$_1$ and r@xx$_2$@xy$_2$@xz$_2$)) $\Rightarrow$ (r@xa@xb@xc))) $\Rightarrow$ (r@(cP@c_0@y)@(cP@x@y)@(cP@x@y))) thf(cS_INCL_LEM5_pme, conjecture)

SEV204^5.p TPS problem from S-THMS
iS: \$tType thf(iS_type, type)
y: iS thf(y, type)
x: iS thf(x, type)
cP: iS $\to$ iS $\to$ iS thf(cP, type)
c_0: iS thf(c_0, type)
($\forall$xx$_0$: iS, xy$_0$: iS: (cP@xx$_0$@xy$_0$) $\neq$ c_0 and $\forall$xx$_0$: iS, xy$_0$: iS, xu: iS, xv: iS: ((cP@xx$_0$@xu) = (cP@xy$_0$@xv) $\Rightarrow$ (xx$_0$ = xy$_0$ and xu = xv)) and $\forall x$: iS $\to$ \$o: ((x@c_0 and $\forall$xx$_0$: iS, xy$_0$: iS: ((x@xx$_0$ and x@xy$_0$) $\Rightarrow$ (x@(cP@xx$_0$@xy$_0$)))) $\Rightarrow$ $\forall$xx$_0$: iS: (x@xx$_0$))) $\Rightarrow$ $\forall r$: iS $\to$ iS $\to$ iS $\to$ \$o: ((\$true and $\forall$xa: iS, xb: iS, xc: iS: (((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or $\exists$xx$_1$: iS, xx$_2$: iS, xy$_1$: iS, xy$_2$: iS, xz$_1$: iS, xz$_2$: iS: (xa = (cP@xx$_1$@xx$_2$) and xb = (cP@xy$_1$@xy$_2$) and xc = (cP@xz$_1$@xz$_2$) and r@xx$_1$@xy$_1$@xz$_1$ and r@xx$_2$@xy$_2$@xz$_2$)) $\Rightarrow$ (r@xa@xb@xc))) $\Rightarrow$ (r@(cP@x@c_0)@(cP@x@y)@(cP@x@y))) thf(cS_INCL_LEM4_pme, conjecture)

SEV205^5.p TPS problem from S-THMS
b: \$tType thf(b_type, type)
iS: \$tType thf(iS_type, type)
cP$_2$: $b \to b \to b$ thf(cP$_2$, type)
cP: iS $\to$ iS $\to$ iS thf(cP, type)
c_{02}: b thf(c_{02}, type)
c_0: iS thf(c_0, type)
($\forall$xx: iS, xy: iS: (cP@xx@xy) $\neq$ c_0 and $\forall$xx: iS, xy: iS, xu: iS, xv: iS: ((cP@xx@xu) = (cP@xy@xv) $\Rightarrow$ (xx = xy and xu = xv)) and $\forall x$: iS $\to$ \$o: ((x@c_0 and $\forall$xx: iS, xy: iS: ((x@xx and x@xy) $\Rightarrow$ (x@(cP@xx@xy)))) $\Rightarrow$ $\forall$xx: iS: (x@xx)) and $\forall$xx: b, xy: b, xu: b, xv: b: ((cP$_2$@xx@xu) = (cP$_2$@xy@xv) $\Rightarrow$ (xx = xy and xu = xv)) and $\forall$xx: b, xy: b: (c_{02}) $\Rightarrow$ $\exists$xf: iS $\to$ b: ((xf@c_0) = c_{02} and $\forall$xx: iS, xy: iS: (xf@(cP@xx@xy)) = (cP$_2$@(xf@xx)@(xf@xy)) and $\forall$xg: iS $\to$ b: (((xg@c_0) = c_{02} and $\forall$xx: iS, xy: iS: (xg@(cP@xx@xy)) = (cP$_2$@(xg@xx)@(xg@xy))) $\Rightarrow$ xf = xg)) thf(cTHM_S_INIT_p

SEV206^5.p TPS problem from S-THMS
iS: \$tType thf(iS_type, type)
y: iS thf(y, type)
z: iS thf(z, type)
cP: iS $\to$ iS $\to$ iS thf(cP, type)
x: iS thf(x, type)
c_0: iS thf(c_0, type)
($\forall$xx$_0$: iS, xy$_0$: iS: (cP@xx$_0$@xy$_0$) $\neq$ c_0 and $\forall$xx$_0$: iS, xy$_0$: iS, xu: iS, xv: iS: ((cP@xx$_0$@xu) = (cP@xy$_0$@xv) $\Rightarrow$ (xx$_0$ = xy$_0$ and xu = xv)) and $\forall x$: iS $\to$ \$o: ((x@c_0 and $\forall$xx$_0$: iS, xy$_0$: iS: ((x@xx$_0$ and x@xy$_0$) $\Rightarrow$ (x@(cP@xx$_0$@xy$_0$)))) $\Rightarrow$ $\forall$xx$_0$: iS: (x@xx$_0$))) $\Rightarrow$ ($\forall r$: iS $\to$ iS $\to$ iS $\to$ \$o: ((\$true and $\forall$xa: iS, xb: iS, xc: iS: (((xa = c_0 and xb = xc) or (xb = c_0 and xa = xc) or $\exists$xx$_1$: iS, xx$_2$: iS, xy$_1$: iS, xy$_2$: iS, xz$_1$: iS, xz$_2$: iS: (xa = (cP@xx$_1$@xx$_2$) and xb = (cP@xy$_1$@xy$_2$) and xc = (cP@xz$_1$@xz$_2$) and r@xx$_1$@xy$_1$@xz$_1$ and r@xx$_2$@xy$_2$@xz$_2$)) $\Rightarrow$ (r@xa@xb@xc))) $\Rightarrow$

$(r@x@y@y)) \Rightarrow \forall r\colon \mathrm{iS} \to \mathrm{iS} \to \mathrm{iS} \to \$o\colon ((\$true \text{ and } \forall xa\colon \mathrm{iS}, xb\colon \mathrm{iS}, xc\colon \mathrm{iS}\colon (((xa = c_0 \text{ and } xb = xc) \text{ or } (xb = c_0 \text{ and } xa = xc) \text{ or } \exists xx_1\colon \mathrm{iS}, xx_2\colon \mathrm{iS}, xy_1\colon \mathrm{iS}, xy_2\colon \mathrm{iS}, xz_1\colon \mathrm{iS}, xz_2\colon \mathrm{iS}\colon (xa = (\mathrm{cP}@xx_1@xx_2) \text{ and } xb = (\mathrm{cP}@xy_1@xy_2) \text{ and } xc = (\mathrm{cP}@xz_1@xz_2) \text{ and } r@xx_1@xy_1@xz_1 \text{ and } r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@(\mathrm{cP}@z@x)@(\mathrm{cP}@z@y)@(\mathrm{cP}@z@y)$

SEV207^5.p TPS problem from S-THMS
iS: \$tType thf(iS_type, type)
z: iS thf(z, type)
y: iS thf(y, type)
cP: iS → iS → iS thf(cP, type)
x: iS thf(x, type)
c_0: iS thf(c_0, type)
$(\forall xx_0\colon \mathrm{iS}, xy_0\colon \mathrm{iS}\colon (\mathrm{cP}@xx_0@xy_0) \neq c_0 \text{ and } \forall xx_0\colon \mathrm{iS}, xy_0\colon \mathrm{iS}, xu\colon \mathrm{iS}, xv\colon \mathrm{iS}\colon ((\mathrm{cP}@xx_0@xu) = (\mathrm{cP}@xy_0@xv) \Rightarrow (xx_0 = xy_0 \text{ and } xu = xv)) \text{ and } \forall x\colon \mathrm{iS} \to \$o\colon ((x@c_0 \text{ and } \forall xx_0\colon \mathrm{iS}, xy_0\colon \mathrm{iS}\colon ((x@xx_0 \text{ and } x@xy_0) \Rightarrow (x@(\mathrm{cP}@xx_0@xy_0)))) \Rightarrow \forall xx_0\colon \mathrm{iS}\colon (x@xx_0))) \Rightarrow (\forall r\colon \mathrm{iS} \to \mathrm{iS} \to \mathrm{iS} \to \$o\colon ((\$true \text{ and } \forall xa\colon \mathrm{iS}, xb\colon \mathrm{iS}, xc\colon \mathrm{iS}\colon (((xa = c_0 \text{ and } xb = xc) \text{ or } (xb = c_0 \text{ and } xa = xc) \text{ or } \exists xx_1\colon \mathrm{iS}, xx_2\colon \mathrm{iS}, xy_1\colon \mathrm{iS}, xy_2\colon \mathrm{iS}, xz_1\colon \mathrm{iS}, xz_2\colon \mathrm{iS}\colon (xa = (\mathrm{cP}@xx_1@xx_2) \text{ and } xb = (\mathrm{cP}@xy_1@xy_2) \text{ and } xc = (\mathrm{cP}@xz_1@xz_2) \text{ and } r@xx_1@xy_1@xz_1 \text{ and } r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@x@y@y)) \Rightarrow \forall r\colon \mathrm{iS} \to \mathrm{iS} \to \mathrm{iS} \to \$o\colon ((\$true \text{ and } \forall xa\colon \mathrm{iS}, xb\colon \mathrm{iS}, xc\colon \mathrm{iS}\colon (((xa = c_0 \text{ and } xb = xc) \text{ or } (xb = c_0 \text{ and } xa = xc) \text{ or } \exists xx_1\colon \mathrm{iS}, xx_2\colon \mathrm{iS}, xy_1\colon \mathrm{iS}, xy_2\colon \mathrm{iS}, xz_1\colon \mathrm{iS}, xz_2\colon \mathrm{iS}\colon (xa = (\mathrm{cP}@xx_1@xx_2) \text{ and } xb = (\mathrm{cP}@xy_1@xy_2) \text{ and } xc = (\mathrm{cP}@xz_1@xz_2) \text{ and } r@xx_1@xy_1@xz_1 \text{ and } r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@(\mathrm{cP}@x@z)@(\mathrm{cP}@y@z)@(\mathrm{cP}@y@z)$

SEV208^5.p TPS problem from S-THMS
a: \$tType thf(a_type, type)
z: a thf(z, type)
y: a thf(y, type)
cP: $a \to a \to a$ thf(cP, type)
w: a thf(w, type)
x: a thf(x, type)
c_0: a thf(c_0, type)
$(\forall r\colon a \to a \to a \to \$o\colon ((\$true \text{ and } \forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = c_0 \text{ and } xb = xc) \text{ or } (xb = c_0 \text{ and } xa = xc) \text{ or } \exists xx_1\colon a, xx_2\colon a, xy$
$(\mathrm{cP}@xx_1@xx_2) \text{ and } xb = (\mathrm{cP}@xy_1@xy_2) \text{ and } xc = (\mathrm{cP}@xz_1@xz_2) \text{ and } r@xx_1@xy_1@xz_1 \text{ and } r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@x@y@y)) \text{ and } \forall r\colon a \to a \to a \to \$o\colon ((\$true \text{ and } \forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = c_0 \text{ and } xb = xc) \text{ or } (xb = c_0 \text{ and } xa = xc) \text{ or } \exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa = (\mathrm{cP}@xx_1@xx_2) \text{ and } xb = (\mathrm{cP}@xy_1@xy_2) \text{ and } xc = (\mathrm{cP}@xz_1@xz_2) \text{ and } r@xx_1@xy_1@xz_1 \text{ and } r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@w@z@z))) \Rightarrow \forall r\colon a \to a \to a \to \$o\colon ((\$true \text{ and } \forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = c_0 \text{ and } xb = xc) \text{ or } (xb = c_0 \text{ and } xa = xc) \text{ or } \exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa = (\mathrm{cP}@xx_1@xx_2) \text{ and } xb = (\mathrm{cP}@xy_1@xy_2) \text{ and } xc = (\mathrm{cP}@xz_1@xz_2) \text{ and } r@xx_1@xy_1@xz_1 \text{ and } r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@(\mathrm{cP}@x@w)@(\mathrm{cP}@y@z)@(\mathrm{cP}@y@z)$

SEV209^5.p TPS problem from S-THMS
a: \$tType thf(a_type, type)
cP: $a \to a \to a$ thf(cP, type)
c_0: a thf(c_0, type)
$(\lambda xa\colon a, xb\colon a, xc\colon a\colon \forall r\colon a \to a \to a \to \$o\colon ((\$true \text{ and } \forall xa_0\colon a, xb_0\colon a, xc_0\colon a\colon (((xa_0 = c_0 \text{ and } xb_0 = xc_0) \text{ or } (xb_0 = c_0 \text{ and } xa_0 = xc_0) \text{ or } \exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa_0 = (\mathrm{cP}@xx_1@xx_2) \text{ and } xb_0 = (\mathrm{cP}@xy_1@xy_2) \text{ and } xc_0 = (\mathrm{cP}@xz_1@xz_2) \text{ and } r@xx_1@xy_1@xz_1 \text{ and } r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa_0@xb_0@xc_0))) \Rightarrow (r@xa@xb@xc))) =$
$(\lambda xx\colon a, xy\colon a, xz\colon a\colon ((xx = c_0 \text{ and } xy = xz) \text{ or } (xy = c_0 \text{ and } xx = xz) \text{ or } \exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xx = (\mathrm{cP}@xx_1@xx_2) \text{ and } xy = (\mathrm{cP}@xy_1@xy_2) \text{ and } xz = (\mathrm{cP}@xz_1@xz_2) \text{ and } \forall r\colon a \to a \to a \to \$o\colon ((\$true \text{ and } \forall xa\colon a, xb\colon a, xc\colon a\colon ($
$c_0 \text{ and } xb = xc) \text{ or } (xb = c_0 \text{ and } xa = xc) \text{ or } \exists xx_{10}\colon a, xx_{20}\colon a, xy_{10}\colon a, xy_{20}\colon a, xz_{10}\colon a, xz_{20}\colon a\colon (xa = (\mathrm{cP}@xx_{10}@xx_{20}) \text{ and } xb$
$(\mathrm{cP}@xy_{10}@xy_{20}) \text{ and } xc = (\mathrm{cP}@xz_{10}@xz_{20}) \text{ and } r@xx_{10}@xy_{10}@xz_{10} \text{ and } r@xx_{20}@xy_{20}@xz_{20})) \Rightarrow (r@xa@xb@xc))) \Rightarrow$
$(r@xx_1@xy_1@xz_1)) \text{ and } \forall r\colon a \to a \to a \to \$o\colon ((\$true \text{ and } \forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = c_0 \text{ and } xb = xc) \text{ or } (xb =$
$c_0 \text{ and } xa = xc) \text{ or } \exists xx_{10}\colon a, xx_{20}\colon a, xy_{10}\colon a, xy_{20}\colon a, xz_{10}\colon a, xz_{20}\colon a\colon (xa = (\mathrm{cP}@xx_{10}@xx_{20}) \text{ and } xb = (\mathrm{cP}@xy_{10}@xy_{20}) \text{ and } x$
$(\mathrm{cP}@xz_{10}@xz_{20}) \text{ and } r@xx_{10}@xy_{10}@xz_{10} \text{ and } r@xx_{20}@xy_{20}@xz_{20})) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@xx_2@xy_2@xz_2)))))$ thf(c

SEV210^5.p TPS problem from S-THMS
a: \$tType thf(a_type, type)
v: a thf(v, type)
u: a thf(u, type)
cP: $a \to a \to a$ thf(cP, type)
y: a thf(y, type)
x: a thf(x, type)
cZ: a thf(cZ, type)

$(\forall xx_0\colon a, xy_0\colon a\colon (cP@xx_0@xy_0) \neq cZ$ and $\forall xx_0\colon a, xy_0\colon a, xu_0\colon a, xv_0\colon a\colon ((cP@xx_0@xu_0) = (cP@xy_0@xv_0) \Rightarrow (xx_0 = xy_0$ and $xu_0 = xv_0))$ and $\forall x\colon a \to \$o\colon ((x@cZ$ and $\forall xx_0\colon a, xy_0\colon a\colon ((x@xx_0$ and $x@xy_0) \Rightarrow (x@(cP@xx_0@xy_0)))) \Rightarrow \forall xx_0\colon a\colon (x@xx_0))) \Rightarrow (\forall r\colon a \to a \to a \to \$o\colon ((\$true$ and $\forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = cZ$ and $xb = xc)$ or $(xb = cZ$ and $xa = xc)$ or $\exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@x@u@u)) \Rightarrow (\forall r\colon a \to a \to a \to \$o\colon ((\$true$ and $\forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = cZ$ and $xb = xc)$ or $(xb = cZ$ and $xa = xc)$ or $\exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@y@v@v)) \Rightarrow \forall r\colon a \to a \to a \to \$o\colon ((\$true$ and $\forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = cZ$ and $xb = xc)$ or $(xb = cZ$ and $xa = xc)$ or $\exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@(cP@x@y)@(cP@u@v)@(cP@u@v)))))$ thf(cS_LEM1E_pme, conjecture)

SEV211^5.p TPS problem from S-THMS
a: \$tType thf(a_type, type)
y: a thf(y, type)
cP: $a \to a \to a$ thf(cP, type)
cZ: a thf(cZ, type)
x: a thf(x, type)
z: a thf(z, type)
$(\forall xx_0\colon a, xy_0\colon a\colon (cP@xx_0@xy_0) \neq cZ$ and $\forall xx_0\colon a, xy_0\colon a, xu\colon a, xv\colon a\colon ((cP@xx_0@xu) = (cP@xy_0@xv) \Rightarrow (xx_0 = xy_0$ and $xu = xv))$ and $\forall x\colon a \to \$o\colon ((x@cZ$ and $\forall xx_0\colon a, xy_0\colon a\colon ((x@xx_0$ and $x@xy_0) \Rightarrow (x@(cP@xx_0@xy_0)))) \Rightarrow \forall xx_0\colon a\colon (x@xx_0))) \Rightarrow (\forall r\colon a \to a \to a \to \$o\colon ((\$true$ and $\forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = cZ$ and $xb = xc)$ or $(xb = cZ$ and $xa = xc)$ or $\exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@(cP@x@y)@z@z)) \Rightarrow \exists xu\colon a, xv\colon a\colon (z = (cP@xu@xv)$ and $\forall r\colon a \to a \to a \to \$o\colon ((\$true$ and $\forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = cZ$ and $xb = xc)$ or $(xb = cZ$ and $xa = xc)$ or $\exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@x@xu@xu))$ and $\forall r\colon a \to a \to a \to \$o\colon ((\$true$ and $\forall xa\colon a, xb\colon a, xc\colon a\colon (((xa = cZ$ and $xb = xc)$ or $(xb = cZ$ and $xa = xc)$ or $\exists xx_1\colon a, xx_2\colon a, xy_1\colon a, xy_2\colon a, xz_1\colon a, xz_2\colon a\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@y@xv@xv))))$ thf(cS_LEM1F_p

SEV212^5.p TPS problem from S-THMS
iS: \$tType thf(iS_type, type)
cP: iS $\to$ iS $\to$ iS thf(cP, type)
c_0: iS thf(c_0, type)
$(\forall xx\colon iS, xy\colon iS\colon (cP@xx@xy) \neq c_0$ and $\forall xx\colon iS, xy\colon iS, xu\colon iS, xv\colon iS\colon ((cP@xx@xu) = (cP@xy@xv) \Rightarrow (xx = xy$ and $xu = xv))$ and $\forall x\colon iS \to \$o\colon ((x@c_0$ and $\forall xx\colon iS, xy\colon iS\colon ((x@xx$ and $x@xy) \Rightarrow (x@(cP@xx@xy)))) \Rightarrow \forall xx\colon iS\colon (x@xx))) \Rightarrow \forall xx\colon iS, xy\colon iS, xu\colon iS, xv\colon iS\colon ((\forall r\colon iS \to iS \to iS \to \$o\colon ((\$true$ and $\forall xa\colon iS, xb\colon iS, xc\colon iS\colon (((xa = c_0$ and $xb = xc)$ or $(xb = c_0$ and $xa = xc)$ or $\exists xx_1\colon iS, xx_2\colon iS, xy_1\colon iS, xy_2\colon iS, xz_1\colon iS, xz_2\colon iS\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@xx@xy@xy))$ and $\forall r\colon iS \to iS \to iS \to \$o\colon ((\$true$ and $\forall xa\colon iS, xb\colon iS, xc\colon iS\colon (((xa = c_0$ and $xb = xc)$ or $(xb = c_0$ and $xa = xc)$ or $\exists xx_1\colon iS, xx_2\colon iS, xy_1\colon iS, xy_2\colon iS, xz_1\colon iS, xz_2\colon iS\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@xu@xv@xv))) \Rightarrow \forall r\colon iS \to iS \to iS \to \$o\colon ((\$true$ and $\forall xa\colon iS, xb\colon iS, xc\colon iS\colon (((xa = c_0$ and $xb = xc)$ or $(xb = c_0$ and $xa = xc)$ or $\exists xx_1\colon iS, xx_2\colon iS, xy_1\colon iS, xy_2\colon iS, xz_1\colon iS, xz_2\colon iS\colon (xa = (cP@xx_1@xx_2)$ and $xb = (cP@xy_1@xy_2)$ and $xc = (cP@xz_1@xz_2)$ and $r@xx_1@xy_1@xz_1$ and $r@xx_2@xy_2@xz_2)) \Rightarrow (r@xa@xb@xc))) \Rightarrow (r@(cP@xx@xu)@(cP@xy@xv)@(cP@xy@xv))))$ thf(cS_LEM2_pme, conjecture)

SEV214^5.p TPS problem from S-T-THMS
iS: \$tType thf(iS_type, type)
c_0: iS thf(c_0, type)
cP: iS $\to$ iS $\to$ iS thf(cP, type)
$(\forall xx\colon iS, xy\colon iS\colon (cP@xx@xy) \neq c_0$ and $\forall xx\colon iS, xy\colon iS, xu\colon iS, xv\colon iS\colon ((cP@xx@xu) = (cP@xy@xv) \Rightarrow (xx = xy$ and $xu = xv))$ and $\forall x\colon iS \to \$o\colon ((x@c_0$ and $\forall xx\colon iS, xy\colon iS\colon ((x@xx$ and $x@xy) \Rightarrow (x@(cP@xx@xy)))) \Rightarrow \forall xx\colon iS\colon (x@xx))) \Rightarrow ((\lambda xx\colon iS\colon (xx = c_0$ or $\exists xy\colon iS\colon c_0 = (cP@xx@xy))) = (\lambda xx\colon iS, xy\colon iS\colon xx = xy@c_0)$ and $(\lambda xy\colon iS\colon (xy = c_0$ or $\exists xx\colon iS\colon c_0 = (cP@xx@xy))) = (\lambda xx\colon iS, xy\colon iS\colon xx = xy@c_0))$ thf(cS_T_LR_LEM2_pme, conjecture)

SEV218^5.p TPS problem from CHOICE-COVER-THMS
a: \$tType thf(a_type, type)
cQ: $a \to a \to \$o$ thf(cQ, type)

∃xf: $a \to a \to$ $o: ∀xx: $a: (∃xz: $a: (xf@xx@xz) and ∀xx$_0$: $a: ((xf@xx@xx$_0$) ⇒ ∀xy: $a: ((xf@xx@xy) ⟺ (cQ@xx$_0$@xy))) and xf@xx@xx) ⇒ (∀xx: $a: (cQ@xx@xx) and ∀xx: $a, xy: $a: ((cQ@xx@xy) ⇒ (cQ@xy@xx)) and ∀xx: $a, xy: (cQ@xx@xz))) thf(cTHM559A_pme, conjecture)

SEV220^5.p TPS problem X5205
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
f: $b \to a$ thf(f, type)
w: $(b \to$ o) → $o thf($w$, type)
∀xx: $a: (∃xt: $b: (∀$s$: $b \to$ $o: (($w$@$s$) ⇒ ($s$@xt)) and xx = ($f$@xt)) ⇒ ∀$s$: $a \to$ $o: (∃xt: $b \to$ $o: ($w$@xt and s = (λxz: $a: ∃xt$_0$: $b: (xt@xt$_0$ and xz = (f@xt$_0$)))) ⇒ (s@xx))) thf(cX5205_pme, conjecture)

SEV221^5.p TPS problem THM61
a: $tType thf(a_type, type)
cZ: $a \to$ $o thf(cZ, type)
cW: $(a \to$ $o) → $o thf(cW, type)
∀xx: $a: ((∃$s$: $a \to$ $o: (cW@$s$ and s@xx) and cZ@xx) ⟺ ∃s: $a \to$ $o: (∃xt: $a \to$ $o: (cW@xt and s = (λxx$_0$: $a: (cZ@xx$_0$ and xt@xx$_0$))) and s@xx)) thf(cTHM61_pme, conjecture)

SEV222^5.p TPS problem THM60
a: $tType thf(a_type, type)
cZ: $a \to$ $o thf(cZ, type)
cW: $(a \to$ $o) → $o thf(cW, type)
∀xx: $a: ((∀$s$: $a \to$ $o: (($cW@s) ⇒ (s@xx)) or cZ@xx) ⟺ ∀s: $a \to$ $o: (∃xt: $a \to$ $o: (cW@xt and s = (λxz: $a: (cZ@xz or xt@xz))) ⇒ (s@xx))) thf(cTHM60_pme, conjecture)

SEV223^5.p TPS problem X5204
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
f: $b \to a$ thf(f, type)
w: $(b \to$ $o) → $o thf($w$, type)
(λxz: $a: ∃xt: $b: (∃$s$: $b \to$ $o: ($w$@$s$ and s@xt) and xz = (f@xt))) = (λxx: $a: ∃$s$: $a \to$ $o: (∃xt: $b \to$ $o: ($w$@xt and s = (λxz: $a: ∃xt$_0$: $b: (xt@xt$_0$ and xz = (f@xt$_0$)))) and s@xx)) thf(cX5204_pme, conjecture)

SEV224^5.p TPS problem from FUNS-AND-SETS-OF-SETS-THMS
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
∀xa: $b \to a \to$ $o, xy: $a, xr: $b \to$ $o: (xr = (λxj: $b: (xa@xj@xy)) ⇒ ∃xp: $(b \to$ $o) → $(b \to$ $o) → $o: ∀xs: $b → $o: (∀$s$: $a \to$ $o: (∃xt: $b: (xs@xt and s = (xa@xt)) ⇒ (s@xy)) ⟺ (xp@xr@xs))) thf(cTHM142_1_pme, conjecture)

SEV225^5.p TPS problem from REALS-THMS
r: $tType thf(r_type, type)
c_0: $r thf(c0_type, type)
less: $r \to r \to$ $o thf(less_type, type)
cIRREFLEXIVE_LAW: $o thf(cIRREFLEXIVE_LAW_type, type)
cIRREFLEXIVE_LAW = (∀xx: $r: ¬ less@xx@xx) thf(cIRREFLEXIVE_LAW_def, definition)
cIRREFLEXIVE_LAW ⇒ ∀xx: $r: ¬ less@xx@$c_0$ and xx = c_0 thf(cPARNAS_FIG3_A, conjecture)

SEV226^5.p TPS problem from REALS-THMS
c_less_: $i → $i → $o thf(c_less_, type)
b: $i thf($b$, type)
a: $i thf($a$, type)
∀xf: $i → $i, x_0: $i: ((∀$a$: $i → $o: (($a$@xl) and ∃xu: $i: ∀xx: $i: (($a$@xx) ⇒ (c_less_@xx@xu or xx = xu))) ⇒ ∃xl: $i: (∀xx: $i: (($a$@xx) ⇒ (c_less_@xx@xl or xx = xl)) and ∀xy: $i: (∀xx: $i: (($a$@xx) ⇒ (c_less_@xx@xy or xx = xy)) ⇒ (c_less_@xl@xy or xl = xy)))) and ∀xx: $i: ((c_less_@$x_0$@(xf@xx)) ⇒ ∃xt: $i: (c_less_@xt@x (c_less_@x_0@(xf@xs))))) and ∀xx: $i: ((c_less_@(xf@xx)@$x_0$) ⇒ ∃xt: $i: (c_less_@xx@xt and ∀xs: $i: ((c_less_@xs@xt and c_le (c_less_@(xf@xs)@x_0)))) and ∀xx: $i, xy: $i, xz: $i: ((c_less_@xx@xy and c_less_@xy@xz) ⇒ (c_less_@xx@xz)) and ∀xx: $i: ¬ c xy) and c_less_@$a$@$b$ and c_less_@(xf@a)@x_0 and c_less_@x_0@(xf@b)) ⇒ ∃xx: $i: (c_less_@$a$@xx and c_less_@xx@$b$ and ¬ c_le

SEV227^5.p TPS problem X5200
a: $tType thf(a_type, type)
y: $a \to$ $o thf($y$, type)
x: $a \to$ $o thf($x$, type)
(λxz: $a: ($x$@xz or y@xz)) = (λxx$_0$: $a: ∃$s$: $a \to$ $o: (($s$ = x or s = y) and s@xx$_0$)) thf(cX5200_pme, conjecture)

SEV228^5.p TPS problem THM91A
a: $tType thf(a_type, type)
cS: $a \to$ $o thf(cS, type)
$\forall$xx: a: ((cS@xx) $\Rightarrow$ $\exists s_{11}$: $a \to$ $o: ($\forall$xx$_0$: a: ((s_{11}@xx$_0$) $\Rightarrow$ (cS@xx$_0$)) and s_{11}@xx)) thf(cTHM91A_pme, conjecture)

SEV229^5.p TPS problem X5209
a: $tType thf(a_type, type)
cE: $a \to$ $o thf(cE, type)
cD: $a \to$ $o thf(cD, type)
(λr: $a \to$ $o: $\forall$xx: a: ((r@xx) $\Rightarrow$ (cD@xx and cE@xx))) = (λxx: $a \to$ $o: ($\forall$xx$_0$: a: ((xx@xx$_0$) $\Rightarrow$ (cD@xx$_0$)) and $\forall$xx$_0$: a: ((x
(cE@xx$_0$)))) thf(cX5209_pme, conjecture)

SEV230^5.p TPS problem THM88
a: $tType thf(a_type, type)
$\forall u$: $a \to$ $o, v: $a \to$ $o: ($\forall$xx: a: ((u@xx) $\Rightarrow$ (v@xx)) $\Rightarrow$ $\forall$xx: ($a \to$ $o) $\to$ $o: ($\forall$xx$_0$: $a \to$ $o: ((xx@xx$_0$) $\Rightarrow$
$\forall$xx$_1$: a: ((xx$_0$@xx$_1$) $\Rightarrow$ (u@xx$_1$))) $\Rightarrow$ $\forall$xx$_0$: $a \to$ $o: ((xx@xx$_0$) $\Rightarrow$ $\forall$xx$_1$: a: ((xx$_0$@xx$_1$) $\Rightarrow$ (v@xx$_1$))))) thf(cTHM88_pr

SEV231^5.p TPS problem X5201
a: $tType thf(a_type, type)
y: $a \to$ $o thf($y$, type)
x: $a \to$ $o thf($x$, type)
(λxx$_0$: a: (x@xx$_0$ and y@xx$_0$)) = (λxx$_0$: a: $\forall s$: $a \to$ $o: (($s = x$ or $s = y$) $\Rightarrow$ (s@xx$_0$))) thf(cX5201_pme, conjecture)

SEV232^5.p TPS problem X6007
cS: (($i $\to$ $o) $\to$ $o) $\to$ ($i $\to$ $o) $\to$ $o thf(cS, type)
c_0: ($i $\to$ $o) $\to$ $o thf($c_0$, type)
(λn: ($i $\to$ $o) $\to$ $o: $\forall p$: (($i $\to$ $o) $\to$ $o) $\to$ $o: (($p$@$c_0$ and $\forall x$: ($i $\to$ $o) $\to$ $o: (($p$@$x$) $\Rightarrow$ (p@(cS@x)))) $\Rightarrow$
(p@n))) = (λxx: ($i $\to$ $o) $\to$ $o: $\forall s_0$: (($i $\to$ $o) $\to$ $o) $\to$ $o: (($s_0$@$c_0$ and $\forall x$: ($i $\to$ $o) $\to$ $o: (($s_0$@$x$) $\Rightarrow$
(s_0@(cS@x)))) $\Rightarrow$ (s_0@xx))) thf(cX6007_pme, conjecture)

SEV233^5.p TPS problem THM46
cE: $i $\to$ $o thf(cE, type)
cD: $i $\to$ $o thf(cD, type)
$\forall$xx: $i $\to$ $o: ($\forall$xx$_0$: $i: ((xx@xx$_0$) $\Rightarrow$ (cD@xx$_0$ and cE@xx$_0$)) $\Rightarrow$ ($\forall$xx$_0$: $i: ((xx@xx$_0$) $\Rightarrow$ (cD@xx$_0$)) and $\forall$xx$_0$: $i: ((xx@x
(cE@xx$_0$)))) thf(cTHM46_pme, conjecture)

SEV234^5.p TPS problem BLEDSOE-FENG-SV-10
If a set B has the property that every x in B has a nbhd D subset B, then B is open.
cOPEN: ($i $\to$ $o) $\to$ $o thf(cOPEN, type)
$\forall d$: $i $\to$ $o, g: ($i $\to$ $o) $\to$ $o: (($\forall$xx: $i $\to$ $o: (($g$@xx) $\Rightarrow$ (cOPEN@xx)) and d = (λxx: $i: $\exists s$: $i $\to$
$o: ($g$@$s$ and s@xx))) $\Rightarrow$ (cOPEN@d)) $\Rightarrow$ $\forall b$: $i $\to$ $o: ($\forall$xx: $i: (($b$@xx) $\Rightarrow$ $\exists d$: $i $\to$ $o: (cOPEN@$d$ and d@xx and $\forall$xx$_0$: $
(b@xx$_0$)))) $\Rightarrow$ (cOPEN@b)) thf(cBLEDSOE_FENG_SV_10_pme, conjecture)

SEV235^5.p TPS problem THM46A
cE: $i $\to$ $o thf(cE, type)
cD: $i $\to$ $o thf(cD, type)
$\forall$xx: $i $\to$ $o: ($\forall$xx$_0$: $i: ((xx@xx$_0$) $\Rightarrow$ (cD@xx$_0$ and cE@xx$_0$)) $\iff$ ($\forall$xx$_0$: $i: ((xx@xx$_0$) $\Rightarrow$ (cD@xx$_0$)) and $\forall$xx$_0$: $i: ((xx@
(cE@xx$_0$)))) thf(cTHM46A_pme, conjecture)

SEV236^5.p TPS problem THM91
a: $tType thf(a_type, type)
cS: $a \to$ $o thf(cS, type)
cK: ($a \to$ $o) $\to$ $a \to$ $o thf(cK, type)
$\forall x$: $a \to$ $o, y: $a \to$ $o: ($\forall$xx: a: ((x@xx) $\Rightarrow$ (y@xx)) $\Rightarrow$ $\forall$xx: a: ((cK@x@xx) $\Rightarrow$ (cK@y@xx))) $\Rightarrow$
$\forall$xx: a: ((cK@cS@xx) $\Rightarrow$ (cK@λxx$_0$: a: $\exists s_3$: $a \to$ $o: ($\forall$xx$_1$: a: ((s_3@xx$_1$) $\Rightarrow$ (cS@xx$_1$)) and s_3@xx$_0$)@xx)) thf(cTHM91_

SEV237^5.p TPS problem THM616
cOPEN: ($i $\to$ $o) $\to$ $o thf(cOPEN, type)
$\forall g$: ($i $\to$ $o) $\to$ $o: ($\forall$xx: $i $\to$ $o: (($g$@xx) $\Rightarrow$ (cOPEN@xx)) $\Rightarrow$ (cOPEN@λxx: $i: $\exists s$: $i $\to$ $o: ($g$@$s$ and s@xx))) $\Rightarrow$
$\forall b$: $i $\to$ $o: ($\forall$xx: $i: (($b$@xx) $\Rightarrow$ $\exists d$: $i $\to$ $o: (cOPEN@$d$ and d@xx and $\forall$xx$_0$: $i: (($d$@xx$_0$) $\Rightarrow$ (b@xx$_0$)))) $\Rightarrow$
(cOPEN@b)) thf(cTHM616_pme, conjecture)

SEV238^5.p TPS problem THM2D
$\forall k$: ($i $\to$ $o) $\to$ $i $\to$ $o: ((($\forall$xx: $i $\to$ $o: ($\forall$xx$_0$: $i: ((xx@xx$_0$) $\Rightarrow$ $\exists s$: $i $\to$ $o: ($\forall$xx$_1$: $i: (($s$@xx$_1$) $\Rightarrow$
(k@s@xx$_1$)) and s@xx$_0$)) $\Rightarrow$ $\forall$xx$_0$: $i: (($k$@xx@xx$_0$) $\Rightarrow$ (k@λxx$_1$: $i: $\exists s$: $i $\to$ $o: ($\forall$xx$_2$: $i: (($s$@xx$_2$) $\Rightarrow$

$(k@s@xx_2))$ and $s@xx_1)@xx_0)))$ and $(\forall xx$: \$i: $(\exists s$: \$i $\to$ \$o: $(\forall xx_0$: \$i: $((s@xx_0) \Rightarrow (k@s@xx_0))$ and $s@xx) \Rightarrow (k@\lambda xx_0$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_1$: \$i: $((s@xx_1) \Rightarrow (k@s@xx_1))$ and $s@xx_0)@xx)) \Rightarrow \forall xx$: \$i: $((k@\lambda xx_0$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_1$: \$i: $((s@xx_1) \Rightarrow (k@s@xx_1))$ and $s@xx_0)@xx) \Rightarrow (k@(k@\lambda xx_0$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_1$: \$i: $((s@xx_1) \Rightarrow (k@s@xx_1))$ and $s@xx_0))@xx))))) \Rightarrow \forall xx$: \$i: $((k@\lambda xx_0$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_1$: \$i: $((s@xx_1) \Rightarrow (k@s@xx_1))$ and $s@xx_0)@xx$ $(\forall xx_0$: \$i: $((k@\lambda xx_1$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_2$: \$i: $((s@xx_2) \Rightarrow (k@s@xx_2))$ and $s@xx_1)@xx_0) \Rightarrow (k@(k@\lambda xx_1$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_2$: \$i: $((s@xx_2) \Rightarrow (k@s@xx_2))$ and $s@xx_1))@xx_0))$ and $k@\lambda xx_0$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_1$: \$i: $((s@xx_1) \Rightarrow (k@s@xx_1))$ and $s@xx_0)@xx)))$ thf(cTHM2D_pme, conjecture)

SEV239∧5.p TPS problem X5211
a: \$tType thf(a_type, type)
y: $a \to$ \$o thf(y, type)
$y = (\lambda xx$: a: $\exists s$: $a \to$ \$o: $(\exists xx_0$: a: $(y@xx_0$ and $s = (\lambda xx$: a, xy: a: xx = xy$@xx_0))$ and $s@xx))$ thf(cX5211_pme, conjecture)

SEV240∧5.p TPS problem from SETS-OF-SETS-THMS
a: \$tType thf(a_type, type)
cA: $(a \to$ \$o$) \to$ \$o thf(cA, type)
$\forall xx$: $a \to$ \$o: $((cA@xx) \Rightarrow \forall xx_0$: a: $((xx@xx_0) \Rightarrow \exists s$: $a \to$ \$o: $(cA@s$ and $s@xx_0)))$ thf(cDOMTHM1_pme, conjecture)

SEV241∧5.p TPS problem from SETS-OF-SETS-THMS
a: \$tType thf(a_type, type)
cW: $a \to$ \$o thf(cW, type)
cU: $a \to$ \$o thf(cU, type)
$\forall xx$: a: $((cU@xx$ and $cW@xx) \Rightarrow \forall s$: $a \to$ \$o: $((s =$ cU or $s =$ cW$) \Rightarrow (s@xx)))$ thf(cX5201A_pme, conjecture)

SEV242∧5.p TPS problem from SETS-OF-SETS-THMS
$\forall p$: \$i $\to$ \$o, q: \$i $\to$ \$o: $(\forall x$: \$i: $((p@x) \iff (q@x)) \Rightarrow p = q) \Rightarrow \forall t$: (\$i $\to$ \$o$) \to$ \$o, u: \$i $\to$ \$o, v: \$i $\to$ \$o: $((t@\lambda xx$: \$i: $\exists s$: \$i $\to$ \$o: $((s = u$ or $s = v)$ and $s@xx)) \Rightarrow (t@\lambda xz$: \$i: $(u@xz$ or $v@xz)))$ thf(cTHM4A_pme, conjectur

SEV243∧5.p TPS problem from SETS-OF-SETS-THMS
a: \$tType thf(a_type, type)
cK: $(a \to$ \$o$) \to a \to$ \$o thf(cK, type)
$\forall y$: $a \to$ \$o, x: $a \to$ \$o: $(\forall xx$: a: $((x@xx) \Rightarrow (y@xx)) \Rightarrow \forall xx$: a: $((cK@x@xx) \Rightarrow (cK@y@xx))) \Rightarrow \forall xx$: a: $((cK@\lambda xx_0$: a: $\exists s$: $a \to$ \$o: $(\forall xx_1$: a: $((s@xx_1) \Rightarrow (cK@s@xx_1))$ and $s@xx_0)@xx) \iff \exists s$: $a \to$ \$o: $(\forall xx_0$: a: $((s@xx_0) \Rightarrow (cK@s@xx_0))$ and $s@xx))$ thf(cTHM116_C_pme, conjecture)

SEV244∧5.p TPS problem from SETS-OF-SETS-THMS
a: \$tType thf(a_type, type)
cK: $(a \to$ \$o$) \to a \to$ \$o thf(cK, type)
$\forall x$: $a \to$ \$o, y: $a \to$ \$o: $(\forall xx$: a: $((x@xx) \Rightarrow (y@xx)) \Rightarrow \forall xx$: a: $((cK@x@xx) \Rightarrow (cK@y@xx))) \Rightarrow \forall xx$: a: $((cK@\lambda xx_0$: a: $\exists s$: $a \to$ \$o: $(\forall xx_1$: a: $((s@xx_1) \Rightarrow (cK@s@xx_1))$ and $s@xx_0)@xx) \iff \exists s$: $a \to$ \$o: $(\forall xx_0$: a: $((s@xx_0) \Rightarrow (cK@s@xx_0))$ and $s@xx))$ thf(cTHM116_pme, conjecture)

SEV244∧6.p TPS problem from SETS-OF-SETS-THMS
$\forall k$: $(\$i \to \$o) \to \$i \to \$o$: $(\forall xx$: \$i $\to$ \$o, xy: \$i $\to$ \$o: $(\forall xx_0$: \$i: $((xx@xx_0) \Rightarrow (xy@xx_0)) \Rightarrow \forall xx_0$: \$i: $((k@xx@xx_0) \Rightarrow (k@xy@xx_0))) \Rightarrow \forall xx$: \$i: $((k@\lambda xx_0$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_1$: \$i: $((s@xx_1) \Rightarrow (k@s@xx_1))$ and $s@xx_0)@xx) \iff \exists s$: \$i $\to$ \$o: $(\forall xx_0$: \$i: $((s@xx_0) \Rightarrow (k@s@xx_0))$ and $s@xx)))$ thf(cTHM2A_pme, conjecture)

SEV245∧5.p TPS problem from SETS-OF-SETS-THMS
$\forall k$: $(\$i \to \$o) \to \$i \to \$o$: $(\forall xx$: \$i $\to$ \$o, xy: \$i $\to$ \$o: $(\forall xx_0$: \$i: $((xx@xx_0) \Rightarrow (xy@xx_0)) \Rightarrow \forall xx_0$: \$i: $((k@xx@xx_0) \Rightarrow (k@xy@xx_0))) \Rightarrow \forall xx$: \$i: $(\exists s$: \$i $\to$ \$o: $(\forall xx_0$: \$i: $((s@xx_0) \Rightarrow (k@s@xx_0))$ and $s@xx) \Rightarrow (k@\lambda xx_0$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_1$: \$i: $((s@xx_1) \Rightarrow (k@s@xx_1))$ and $s@xx_0)@xx)))$ thf(cTHM2A_TWO_pme, conjecture)

SEV245∧6.p TPS problem from BASIC-HO-THMS
a: \$tType thf(a_type, type)
cK: $(a \to$ \$o$) \to a \to$ \$o thf(cK, type)
$\forall x$: $a \to$ \$o, y: $a \to$ \$o: $(\forall xx$: a: $((x@xx) \Rightarrow (y@xx)) \Rightarrow \forall xx$: a: $((cK@x@xx) \Rightarrow (cK@y@xx))) \Rightarrow \forall xx$: a: $(\exists s$: $a \to$ \$o: $(\forall xx_0$: a: $((s@xx_0) \Rightarrow (cK@s@xx_0))$ and $s@xx) \Rightarrow (cK@\lambda xx_0$: a: $\exists s$: $a \to$ \$o: $(\forall xx_1$: a: $((s@xx_1) \Rightarrow (cK@s@xx_1))$ and $s@xx_0)@xx))$ thf(cTHM116_2S, conjecture)

SEV246∧5.p TPS problem from SETS-OF-SETS-THMS
$\forall k$: $(\$i \to \$o) \to \$i \to \$o$: $(\forall xx$: \$i $\to$ \$o, xy: \$i $\to$ \$o: $(\forall xx_0$: \$i: $((xx@xx_0) \Rightarrow (xy@xx_0)) \Rightarrow \forall xx_0$: \$i: $((k@xx@xx_0) \Rightarrow (k@xy@xx_0))) \Rightarrow \forall xx$: \$i: $((k@\lambda xx_0$: \$i: $\exists s$: \$i $\to$ \$o: $(\forall xx_1$: \$i: $((s@xx_1) \Rightarrow (k@s@xx_1))$ and $s@xx_0)@xx) \Rightarrow \exists s$: \$i $\to$ \$o: $(\forall xx_0$: \$i: $((s@xx_0) \Rightarrow (k@s@xx_0))$ and $s@xx)))$ thf(cTHM2A_ONE_pme, conjecture)

SEV246∧6.p TPS problem from BASIC-HO-THMS
a: \$tType thf(a_type, type)

cK: $(a \to \$o) \to a \to \$o$ thf(cK, type)
$\forall x\colon a \to \$o, y\colon a \to \$o\colon (\forall xx\colon a\colon ((x@xx) \Rightarrow (y@xx)) \Rightarrow \forall xx\colon a\colon ((cK@x@xx) \Rightarrow (cK@y@xx))) \Rightarrow \forall xx\colon a\colon ((cK@\lambda xx_0\colon a\colon \exists s\colon a \to \$o\colon (\forall xx_1\colon a\colon ((s@xx_1) \Rightarrow (cK@s@xx_1)) \text{ and } s@xx_0)@xx) \Rightarrow \exists s\colon a \to \$o\colon (\forall xx_0\colon a\colon ((s@xx_0) \Rightarrow (cK@s@xx_0)) \text{ and } s@xx))$ thf(cTHM116_1S, conjecture)

SEV248^5.p TPS problem from SETS-OF-SETS-THMS
a: $tType thf(a_type, type)
$\forall x\colon a, y\colon a, u\colon a, v\colon a\colon (\forall xx\colon a \to \$o\colon ((xx = (\lambda xy\colon a\colon x = xy) \text{ or } \forall w\colon a\colon ((xx@w) \iff (w = x \text{ or } w = y))) \iff (xx = (\lambda xy\colon a\colon u = xy) \text{ or } \forall w\colon a\colon ((xx@w) \iff (w = u \text{ or } w = v)))) \iff (x = u \text{ and } y = v))$ thf(cTHM103_pme, conjecture)

SEV249^5.p TPS problem from SETS-OF-SETS-THMS
cX: $i \to \$o$ thf(cX, type)
$\forall xw\colon (\$i \to \$o) \to \$o\colon ((xw@\lambda xx\colon \$i\colon \$false \text{ and } \forall xr\colon \$i \to \$o, xx\colon \$i\colon ((xw@xr) \Rightarrow (xw@\lambda xt\colon \$i\colon (xr@xt \text{ or } xt = xx)))) \Rightarrow (xw@cX)) \Rightarrow \forall xw\colon ((\$i \to \$o) \to \$o) \to \$o\colon ((xw@\lambda xx\colon \$i \to \$o\colon \$false \text{ and } \forall xr\colon (\$i \to \$o) \to \$o, xx\colon \$i \to \$o\colon ((xw@xr) \Rightarrow (xw@\lambda xt\colon \$i \to \$o\colon (xr@xt \text{ or } xt = xx)))) \Rightarrow (xw@\lambda r\colon \$i \to \$o\colon \forall xx\colon \$i\colon ((r@xx) \Rightarrow (cX@xx))))$ thf(cTHM626_pme, conjecture)

SEV250^5.p TPS problem from SETS-OF-SETS-THMS
cOPEN: $(\$i \to \$o) \to \$o$ thf(cOPEN, type)
$\forall d\colon \$i \to \$o, g\colon (\$i \to \$o) \to \$o\colon ((\forall xx\colon \$i \to \$o\colon ((g@xx) \Rightarrow (cOPEN@xx)) \text{ and } d = (\lambda xx\colon \$i\colon \exists s\colon \$i \to \$o\colon (g@s \text{ and } s@xx))) \Rightarrow (cOPEN@d)) \Rightarrow \forall a\colon \$i \to \$o\colon \exists b\colon \$i \to \$o\colon (cOPEN@b \text{ and } \forall xx\colon \$i\colon ((b@xx) \Rightarrow (a@xx)) \text{ and } \forall c\colon \$i \to \$o\colon ((cOPEN@c \text{ and } \forall xx\colon \$i\colon ((c@xx) \Rightarrow (a@xx))) \Rightarrow \forall xx\colon \$i\colon ((c@xx) \Rightarrow (b@xx))))$ thf(cEXISTS

SEV251^5.p TPS problem from SETS-OF-SETS-THMS
cC: $(\$i \to \$o) \to \$o$ thf(cC, type)
cL: $(\$i \to \$o) \to \$o$ thf(cL, type)
$(\forall x\colon \$i \to \$o, y\colon \$i \to \$o\colon ((cL@x \text{ and } cL@y) \Rightarrow (\forall xx\colon \$i\colon ((x@xx) \Rightarrow (y@xx)) \text{ or } \forall xx\colon \$i\colon ((y@xx) \Rightarrow (x@xx)))) \text{ and } \forall xx\colon \$i \to \$o\colon ((cC@xx) \Rightarrow (cL@xx)) \text{ and } \forall xw\colon ((\$i \to \$o) \to \$o) \to \$o\colon ((xw@\lambda xx\colon \$i \to \$o\colon \$false \text{ and } \forall xr\colon (\$i \to \$o) \to \$o, xx\colon \$i \to \$o\colon ((xw@xr) \Rightarrow (xw@\lambda xt\colon \$i \to \$o\colon (xr@xt \text{ or } xt = xx)))) \Rightarrow (xw@cC))) \Rightarrow \exists u\colon \$i \to \$o\colon (cC@u \text{ and } \forall v\colon \$i \to \$o\colon ((cC@v) \Rightarrow \forall xx\colon \$i\colon ((u@xx) \Rightarrow (v@xx))))$ thf(cTHM629_pme, con

SEV252^5.p TPS problem from SETS-OF-SETS-THMS
$\forall k\colon (\$i \to \$o) \to \$i \to \$o\colon ((\forall xx\colon \$i \to \$o, xy\colon \$i \to \$o\colon (\forall xx_0\colon \$i\colon ((xx@xx_0) \Rightarrow (xy@xx_0)) \Rightarrow \forall xx_0\colon \$i\colon ((k@xx@xx_0) \Rightarrow (k@xy@xx_0))) \text{ and } \forall xx\colon \$i \to \$o, xy\colon \$i \to \$o\colon (\forall xx_0\colon \$i\colon ((xx@xx_0) \Rightarrow (xy@xx_0)) \Rightarrow \forall xx_0\colon \$i\colon ((k@xx@xx_0) \Rightarrow (k@xy@xx_0)))) \Rightarrow \forall xx\colon \$i\colon ((k@\lambda xx_0\colon \$i\colon \exists s\colon \$i \to \$o\colon (\forall xx_1\colon \$i\colon ((s@xx_1) \Rightarrow (k@s@xx_1)) \text{ and } s@xx_0)@xx) \iff \exists s\colon \$i \to \$o\colon (\forall xx_0\colon \$i\colon ((s@xx_0) \Rightarrow (k@s@xx_0)) \text{ and } s@xx)))$ thf(cTHM2A_EXPANDED_pme, conjecture)

SEV253^5.p TPS problem from SETS-OF-SETS-THMS
cL: $(\$i \to \$o) \to \$o$ thf(cL, type)
cG: $(\$i \to \$o) \to \$o$ thf(cG, type)
cF: $((\$i \to \$o) \to \$o) \to \$o$ thf(cF, type)
$(\forall c\colon (\$i \to \$o) \to \$o\colon ((\forall xx\colon \$i \to \$o\colon ((c@xx) \Rightarrow (cG@xx)) \text{ and } \forall xx\colon \$i\colon \exists y\colon \$i \to \$o\colon (c@y \text{ and } y@xx)) \Rightarrow \exists d\colon (\$i \to \$o) \to \$o\colon (cF@d \text{ and } \forall xx\colon \$i \to \$o\colon ((d@xx) \Rightarrow (c@xx)) \text{ and } \forall xx\colon \$i\colon \exists y\colon \$i \to \$o\colon (d@y \text{ and } y@xx))) \text{ and } \forall c\colon (\$i \to \$o) \to \$o\colon ((cF@c) \Rightarrow (cF@\lambda u\colon \$i \to \$o\colon (c@\lambda xx\colon \$i\colon \neg u@xx))) \text{ and } \forall b\colon (\$i \to \$o) \to \$o\colon ((cF@b \text{ and } \forall xx\colon \$i \to \$o\colon ((b@xx) \Rightarrow (cL@xx))) \Rightarrow \exists xm\colon \$i\colon \forall z\colon \$i \to \$o\colon ((b@z) \Rightarrow (z@xm))) \text{ and } \forall z\colon \$i \to \$o\colon ((cL@z) \Rightarrow (cG@\lambda xx\colon \$i\colon \neg z@xx))) \Rightarrow \exists xa\colon \$i\colon \forall z\colon \$i \to \$o\colon ((cL@z) \Rightarrow (z@xa))$ thf(cTHM630_pme, conjecture)

SEV254^5.p TPS problem from SETS-OF-SETS-THMS
$\forall k\colon (\$i \to \$o) \to \$i \to \$o\colon ((\forall xx\colon \$i \to \$o\colon (\forall xx_0\colon \$i\colon ((xx@xx_0) \Rightarrow \exists s\colon \$i \to \$o\colon (\forall xx_1\colon \$i\colon ((s@xx_1) \Rightarrow (k@s@xx_1)) \text{ and } s@xx_0)) \Rightarrow \forall xx_0\colon \$i\colon ((k@xx@xx_0) \Rightarrow (k@\lambda xx_1\colon \$i\colon \exists s\colon \$i \to \$o\colon (\forall xx_2\colon \$i\colon ((s@xx_2) \Rightarrow (k@s@xx_2)) \text{ and } s@xx_1)@xx_0))) \text{ and } (\forall xx\colon \$i\colon (\exists s\colon \$i \to \$o\colon (\forall xx_0\colon \$i\colon ((s@xx_0) \Rightarrow (k@s@xx_0)) \text{ and } s@xx) \Rightarrow (k@\lambda xx_0\colon \$i\colon \exists s\colon \$i \to \$o\colon (\forall xx_1\colon \$i\colon ((s@xx_1) \Rightarrow (k@s@xx_1)) \text{ and } s@xx_0)@xx)) \Rightarrow \forall xx\colon \$i\colon ((k@\lambda xx_0\colon \$i\colon \exists s\colon \$i \to \$o\colon (\forall xx_1\colon \$i\colon ((s@xx_1) \Rightarrow (k@s@xx_1)) \text{ and } s@xx_0)@xx) \Rightarrow (k@(k@\lambda xx_0\colon \$i\colon \exists s\colon \$i \to \$o\colon (\forall xx_1\colon \$i\colon ((s@xx_1) \Rightarrow (k@s@xx_1)) \text{ and } s@xx_0))@xx)))) \Rightarrow \forall xx\colon \$i\colon ((k@\lambda xx_0\colon \$i\colon \exists s\colon \$i \to \$o\colon (\forall xx_1\colon \$i\colon ((s@xx_1) \Rightarrow (k@s@xx_1)) \text{ and } s@xx_0)@xx \exists s\colon \$i \to \$o\colon (\forall xx_0\colon \$i\colon ((s@xx_0) \Rightarrow (k@s@xx_0)) \text{ and } s@xx)))$ thf(cTHM2C_pme, conjecture)

SEV256^5.p TPS problem THM625A
THM625 without assuming full topology axioms.
a: $tType thf(a_type, type)
cOPEN: $(a \to \$o) \to \$o$ thf(cOPEN, type)
$\forall k\colon (a \to \$o) \to \$o\colon (\forall xx\colon a \to \$o\colon ((k@xx) \Rightarrow (cOPEN@xx)) \Rightarrow (cOPEN@\lambda xx\colon a\colon \exists s\colon a \to \$o\colon (k@s \text{ and } s@xx))) \Rightarrow (cOPEN@\lambda xx\colon a\colon \$false)$ thf(cTHM625A_pme, conjecture)

SEV257^5.p TPS problem THM625

Empty sets are open in any topology.
a: $tType thf(a_type, type)
cOPEN: $(a \to \$o) \to \$o$ thf(cOPEN, type)
(cOPEN@λxy: a: \$true and $\forall k$: $(a \to \$o) \to \$o$: ($\forall$xx: $a \to \$o$: ($(k@xx) \Rightarrow (cOPEN@xx)$) $\Rightarrow$ (cOPEN@λxx: a: $\exists s$: $a \to$ $\$o$: $(k@s$ and $s@xx)))$ and $\forall y$: $a \to \$o, z$: $a \to \$o$: $((cOPEN@y$ and $cOPEN@z) \Rightarrow (cOPEN@\lambda$xx: a: $(y@xx$ and $z@xx)))) \Rightarrow$
(cOPEN@λxy: a: \$false) thf(cTHM625_pme, conjecture)

SEV258^5.p TPS problem DISCRETE-TOPOLOGY
The discrete topology really is a topology.
a: $tType thf(a_type, type)
$\forall r$: $a \to \$o$: ($r = (\lambda$xx: a: \$false) $\Rightarrow$ \$true) and $\forall r$: $a \to \$o$: ($r = (\lambda$xx: a: $\neg$\$false) $\Rightarrow$ \$true) and $\forall k$: $(a \to$ $\$o) \to \$o, r$: $a \to \$o$: (($\forall$xx: $a \to \$o$: $((k@xx) \Rightarrow$ \$true) and $r = (\lambda$xx: a: $\exists s$: $a \to \$o$: $(k@s$ and $s@xx))) \Rightarrow$
\$true) and $\forall y$: $a \to \$o, z$: $a \to \$o, s$: $a \to \$o$: ((\$true and \$true and $s = (\lambda$xx: a: $(y@xx$ and $z@xx))) $\Rightarrow$ \$true) thf(cDISC

SEV259^5.p TPS problem CLOSURE-THM0
b: $tType thf(b_type, type)
$\forall s$: $(b \to \$o) \to \$o$: (($\forall r$: $b \to \$o$: ($r = (\lambda$xx: b: \$false) $\Rightarrow$ $(s@r)$) and $\forall r$: $b \to \$o$: ($r = (\lambda$xx: b: $\neg$\$false) $\Rightarrow$
$(s@r)$) and $\forall k$: $(b \to \$o) \to \$o, r$: $b \to \$o$: (($\forall$xx: $b \to \$o$: $((k@xx) \Rightarrow (s@xx))$ and $r = (\lambda$xx: b: $\exists s_0$: $b \to$
$\$o$: $(k@s_0$ and $s_0@xx))) \Rightarrow (s@r))$ and $\forall y$: $b \to \$o, z$: $b \to \$o, s_0$: $b \to \$o$: (($s@y$ and $s@z$ and $s_0 = (\lambda$xx: b: $(y@xx$ and $z@xx$
$(s@s_0))) \Rightarrow \forall w$: $b \to \$o,$ xx: b: $((w@xx) \Rightarrow \forall s_0$: $b \to \$o$: (($\forall xx_0$: b: $((w@xx_0) \Rightarrow (s_0@xx_0))$ and $\forall r$: $b \to \$o$: ($r =$
$(\lambda xx_0$: b: $\neg\, s_0@xx_0) \Rightarrow (s@r))) \Rightarrow (s_0@xx))))$ thf(cCLOSURE_THM0_pme, conjecture)

SEV260^5.p TPS problem CLOSED-THM1
The inverse image of a closed set under a continuous function is closed.
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
$\forall t$: $(a \to \$o) \to \$o, s$: $(b \to \$o) \to \$o,$ xf: $a \to b$: (($\forall r$: $a \to \$o$: ($r = (\lambda$xx: a: \$false) $\Rightarrow$ $(t@r)$) and $\forall r$: $a \to$
$\$o$: ($r = (\lambda$xx: a: $\neg$\$false) $\Rightarrow$ $(t@r)$) and $\forall k$: $(a \to \$o) \to \$o, r$: $a \to \$o$: (($\forall$xx: $a \to \$o$: $((k@xx) \Rightarrow$
$(t@xx))$ and $r = (\lambda$xx: a: $\exists s_0$: $a \to \$o$: $(k@s_0$ and $s_0@xx)))$ $\Rightarrow$ $(t@r))$ and $\forall y$: $a \to \$o, z$: $a \to \$o, s_0$: $a \to$
$\$o$: (($t@y$ and $t@z$ and $s_0 = (\lambda$xx: a: $(y@xx$ and $z@xx)))$ $\Rightarrow$ $(t@s_0))$ and $\forall r$: $b \to \$o$: ($r = (\lambda$xx: b: \$false) $\Rightarrow$
$(s@r))$ and $\forall r$: $b \to \$o$: ($r = (\lambda$xx: b: $\neg$\$false) $\Rightarrow$ $(s@r))$ and $\forall k$: $(b \to \$o) \to \$o, r$: $b \to \$o$: (($\forall$xx: $b \to$
$\$o$: $((k@xx) \Rightarrow (s@xx))$ and $r = (\lambda$xx: b: $\exists s_0$: $b \to \$o$: $(k@s_0$ and $s_0@xx)))$ $\Rightarrow$ $(s@r))$ and $\forall y$: $b \to \$o, z$: $b \to$
$\$o, s_0$: $b \to \$o$: (($s@y$ and $s@z$ and $s_0 = (\lambda$xx: b: $(y@xx$ and $z@xx)))$ $\Rightarrow$ $(s@s_0))$ and $\forall x$: $b \to \$o$: (($s@x$) $\Rightarrow$
$\forall y$: $a \to \$o$: ($y = (\lambda$xb: a: $(x@(xf@xb)))$ $\Rightarrow$ $(t@y))))$ $\Rightarrow$ $\forall x$: $b \to \$o$: ($\forall r$: $b \to \$o$: ($r = (\lambda$xx: b: $\neg\, x@xx)$ $\Rightarrow$
$(s@r))$ $\Rightarrow$ $\forall y$: $a \to \$o$: ($y = (\lambda$xb: a: $(x@(xf@xb)))$ $\Rightarrow$ $\forall r$: $a \to \$o$: ($r = (\lambda$xx: a: $\neg\, y@xx)$ $\Rightarrow$ $(t@r)))))$ thf(cCLOSED_TI

SEV261^5.p TPS problem INDISCRETE-TOPOLOGY
a: $tType thf(a_type, type)
$\forall r$: $a \to \$o$: ($r = (\lambda$xx: a: \$false) $\Rightarrow$ ($r = (\lambda$xy: a: \$false) or $r = (\lambda$xy: a: $\neg$\$false))) and $\forall r$: $a \to \$o$: ($r =$
$(\lambda$xx: a: $\neg$\$false) $\Rightarrow$ ($r = (\lambda$xy: a: \$false) or $r = (\lambda$xy: a: $\neg$\$false))) and $\forall k$: $(a \to \$o) \to \$o, r$: $a \to \$o$: (($\forall$xx: $a \to$
$\$o$: $((k@xx) \Rightarrow$ (xx = $(\lambda$xy: a: \$false) or xx = $(\lambda$xy: a: $\neg$\$false))) and $r = (\lambda$xx: a: $\exists s$: $a \to \$o$: $(k@s$ and $s@xx))) \Rightarrow$
($r = (\lambda$xy: a: \$false) or $r = (\lambda$xy: a: $\neg$\$false))) and $\forall y$: $a \to \$o, z$: $a \to \$o, s$: $a \to \$o$: ((($y = (\lambda$xy: a: \$false) or $y =$
$(\lambda$xy: a: $\neg$\$false)) and ($z = (\lambda$xy: a: \$false) or $z = (\lambda$xy: a: $\neg$\$false)) and $s = (\lambda$xx: a: $(y@xx$ and $z@xx))) \Rightarrow$ ($s =$
$(\lambda$xy: a: \$false) or $s = (\lambda$xy: a: $\neg$\$false))) thf(cINDISCRETE_TOPOLOGY_pme, conjecture)

SEV262^5.p TPS problem NBHD-THM2
a: $tType thf(a_type, type)
$\forall t$: $(a \to \$o) \to \$o$: ($\forall k$: $(a \to \$o) \to \$o, r$: $a \to \$o$: (($\forall$xx: $a \to \$o$: $((k@xx) \Rightarrow (t@xx))$ and $r = (\lambda$xx: a: $\exists s$: $a \to$
$\$o$: $(k@s$ and $s@xx))) \Rightarrow (t@r)) \Rightarrow \forall s$: $a \to \$o$: ($(t@s) \iff \forall$xx: a: $((s@xx) \Rightarrow \exists r$: $a \to \$o$: ($\exists n$: $a \to$
$\$o$: ($t@n$ and $\forall xx_0$: a: $((n@xx_0) \Rightarrow (r@xx_0))$ and $n@xx)$ and $\forall xx_0$: a: $((r@xx_0) \Rightarrow (s@xx_0))))))$ thf(cNBHD_THM2_pm

SEV263^5.p TPS problem from TOPOLOGY-THMS
cOPEN: $(\$i \to \$o) \to \$o$ thf(cOPEN, type)
$\forall g$: $(\$i \to \$o) \to \$o$: ($\forall$xx: $\$i \to \$o$: $((g@xx) \Rightarrow (cOPEN@xx)) \Rightarrow (cOPEN@\lambda$xx: \$i: $\exists s$: $\$i \to \$o$: $(g@s$ and $s@xx))) \Rightarrow$
$\forall a$: $\$i \to \$o$: $\exists b$: $\$i \to \$o$: (cOPEN@$b$ and $\forall$xx: \$i: $((b@xx) \Rightarrow (a@xx))$ and $\forall c$: $\$i \to \$o$: ((cOPEN@$c$ and $\forall$xx: \$i: $((c@xx) \Rightarrow$
$(a@xx))) \Rightarrow \forall$xx: \$i: $((c@xx) \Rightarrow (b@xx))))$ thf(cEXISTS_INTERIOR_EXT_pme, conjecture)

SEV264^5.p TPS problem from TOPOLOGY-THMS
a: $tType thf(a_type, type)
$\forall t$: $(a \to \$o) \to \$o$: ($\forall k$: $(a \to \$o) \to \$o$: ($\forall$xx: $a \to \$o$: $((k@xx) \Rightarrow (t@xx)) \Rightarrow (t@\lambda$xx: a: $\exists s$: $a \to$
$\$o$: $(k@s$ and $s@xx))) \Rightarrow \forall s$: $a \to \$o$: ($(t@s) \iff \forall$xx: a: $((s@xx) \Rightarrow \exists r$: $a \to \$o$: ($\exists n$: $a \to \$o$: $(t@n$ and $\forall xx_0$: a: $((n@xx_0)$
$(r@xx_0))$ and $n@xx)$ and $\forall xx_0$: a: $((r@xx_0) \Rightarrow (s@xx_0))))))$ thf(cNBHD_THM2A_pme, conjecture)

SEV265^5.p TPS problem from TOPOLOGY-THMS

$\forall t$: ($\mathrm{i} \to \mathrm{o}$) $\to$ o: (($\forall s$: ($\mathrm{i} \to \mathrm{o}$) $\to$ o: ($\forall \mathrm{xx}$: $\mathrm{i} \to \mathrm{o}$: (($s$@xx) $\Rightarrow$ (t@xx)) $\Rightarrow$ (t@λxx: i: $\exists s_0$: $\mathrm{i} \to$ o: (s@s_0 and s_0@xx))) and $\forall p$: $\mathrm{i} \to \mathrm{o}, q$: $\mathrm{i} \to \mathrm{o}$: (($t$@$p$ and t@q) $\Rightarrow$ (t@λxx: i: (p@xx and q@xx)))) $\Rightarrow$ $\forall u$: $\mathrm{i} \to \mathrm{o}, v$: $\mathrm{i} \to \mathrm{o}$: (($t$@$u$ and t@v) $\Rightarrow$ (t@λxz: i: (u@xz or v@xz)))) thf(cTHM614_pme, conjecture)

SEV266^5.p TPS problem from TOPOLOGY-THMS
$\forall p$: $\mathrm{i} \to \mathrm{o}, q$: $\mathrm{i} \to \mathrm{o}$: ($\forall x$: i: ((p@x) $\iff$ (q@x)) $\Rightarrow$ $p = q$) $\Rightarrow$ $\forall t$: ($\mathrm{i} \to \mathrm{o}$) $\to$ o: (($\forall s$: ($\mathrm{i} \to$ o) $\to$ o: ($\forall \mathrm{xx}$: $\mathrm{i} \to \mathrm{o}$: (($s$@xx) $\Rightarrow$ (t@xx)) $\Rightarrow$ (t@λxx: i: $\exists s_0$: $\mathrm{i} \to$ o: (s@s_0 and s_0@xx))) and $\forall p$: $\mathrm{i} \to$ o, q: $\mathrm{i} \to \mathrm{o}$: (($t$@$p$ and t@q) $\Rightarrow$ (t@λxx: i: (p@xx and q@xx)))) $\Rightarrow$ $\forall u$: $\mathrm{i} \to \mathrm{o}, v$: $\mathrm{i} \to \mathrm{o}$: (($t$@$u$ and t@v) $\Rightarrow$ (t@λxz: i: (u@xz or v@xz)))) thf(cTHM4_pme, conjecture)

SEV267^5.p TPS problem from TOPOLOGY-THMS
a: tType thf(a_type, type)
$\forall t$: ($a \to$ o) $\to$ o: ($\forall s$: $a \to$ o, r: $a \to$ o: (($\forall \mathrm{xx}$: $a \to$ o: ((t@xx and $\forall \mathrm{xx}_0$: a: ((xx@xx_0) $\Rightarrow$ (s@xx_0))) $\Rightarrow$ (t@xx)) and $r = (\lambda \mathrm{xx}$: a: $\exists s_{19}$: $a \to$ o: (t@s_{19} and $\forall \mathrm{xx}_0$: a: ((s_{19}@xx_0) $\Rightarrow$ (s@xx_0)) and s_{19}@xx))) $\Rightarrow$ (t@r)) $\Rightarrow$ $\forall s$: $a \to$ o: ((t@s) $\iff$ $\forall \mathrm{xx}$: a: ((s@xx) $\Rightarrow$ $\exists r$: $a \to$ o: ($\exists n$: $a \to$ o: (t@n and $\forall \mathrm{xx}_0$: a: ((n@xx_0) $\Rightarrow$ (r@xx_0)) and n@xx) and $\forall \mathrm{xx}_0$: a: ((r@xx_0) $\Rightarrow$ (s@xx_0)))))) thf(cNBHD_THM1_pme, conjecture)

SEV268^5.p TPS problem from TOPOLOGY-THMS
a: tType thf(a_type, type)
$\forall t$: ($a \to$ o) $\to$ o: (($\forall r$: $a \to$ o: ($r = (\lambda \mathrm{xx}$: a: false) $\Rightarrow$ (t@r)) and $\forall r$: $a \to$ o: ($r = (\lambda \mathrm{xx}$: a: $\neg \mathrm{false}$) $\Rightarrow$ (t@r)) and $\forall k$: ($a \to$ o) $\to$ o, r: $a \to$ o: (($\forall \mathrm{xx}$: $a \to$ o: ((k@xx) $\Rightarrow$ (t@xx)) and $r = (\lambda \mathrm{xx}$: a: $\exists s$: $a \to$ o: (k@s and s@xx))) $\Rightarrow$ (t@r)) and $\forall y$: $a \to \mathrm{o}, z$: $a \to \mathrm{o}, s$: $a \to$ o: ((t@y and t@z and $s = (\lambda \mathrm{xx}$: a: (y@xx and z@xx))) $\Rightarrow$ (t@s))) $\Rightarrow$ $\forall s$: $a \to$ o: ((t@s) $\iff$ $\forall \mathrm{xx}$: a: ((s@xx) $\Rightarrow$ $\exists r$: $a \to$ o: ($\exists n$: $a \to$ o: (t@n and $\forall \mathrm{xx}_0$: a: ((n@xx_0) $\Rightarrow$ (r@xx_0)) and n@xx) and $\forall \mathrm{xx}_0$: a: ((r@xx_0) $\Rightarrow$ (s@xx_0)))))) thf(cNBHD_THM_pme, conjecture)

SEV269^5.p TPS problem from TOPOLOGY-THMS
b: tType thf(b_type, type)
$\forall s$: ($b \to$ o) $\to$ o: (($\forall r$: $b \to$ o: ($r = (\lambda \mathrm{xx}$: b: false) $\Rightarrow$ (s@r)) and $\forall r$: $b \to$ o: ($r = (\lambda \mathrm{xx}$: b: $\neg \mathrm{false}$) $\Rightarrow$ (s@r)) and $\forall k$: ($b \to$ o) $\to$ o, r: $b \to$ o: (($\forall \mathrm{xx}$: $b \to$ o: ((k@xx) $\Rightarrow$ (s@xx)) and $r = (\lambda \mathrm{xx}$: b: $\exists s_0$: $b \to$ o: (k@s_0 and s_0@xx))) $\Rightarrow$ (s@r)) and $\forall y$: $b \to \mathrm{o}, z$: $b \to \mathrm{o}, s_0$: $b \to$ o: ((s@y and s@z and $s_0 = (\lambda \mathrm{xx}$: b: (y@xx and z@xx $\Rightarrow$ (s@s_0))) $\Rightarrow$ $\forall w$: $b \to \mathrm{o}, r$: $b \to$ o: ($r = (\lambda \mathrm{xx}$: b: $\neg \forall s_0$: $b \to$ o: (($\forall \mathrm{xx}_0$: b: ((w@xx_0) $\Rightarrow$ (s_0@xx_0)) and $\forall r_0$: $b \to$ o: ($r_0 = (\lambda \mathrm{xx}_0$: b: $\neg$ s_0@xx_0) $\Rightarrow$ (s@r_0))) $\Rightarrow$ (s_0@xx))) $\Rightarrow$ (s@r))) thf(cCLOSURE_THM1_pme, conjecture)

SEV270^5.p TPS problem from TOPOLOGY-THMS
cL: ($\mathrm{i} \to \mathrm{o}$) $\to$ o thf(cL, type)
cG: ($\mathrm{i} \to \mathrm{o}$) $\to$ o thf(cG, type)
($\forall c$: ($\mathrm{i} \to \mathrm{o}$) $\to$ o: (($\forall \mathrm{xx}$: $\mathrm{i} \to \mathrm{o}$: (($c$@xx) $\Rightarrow$ (cG@xx)) and $\forall \mathrm{xx}$: i: $\exists y$: $\mathrm{i} \to \mathrm{o}$: ($c$@$y$ and y@xx)) $\Rightarrow$ $\exists d$: ($\mathrm{i} \to \mathrm{o}$) $\to$ o: ($\forall \mathrm{xw}$: (($\mathrm{i} \to \mathrm{o}$) $\to$ o) $\to$ o: ((xw@$\lambda \mathrm{xx}$: $\mathrm{i} \to \mathrm{o}$: false and $\forall \mathrm{xr}$: ($\mathrm{i} \to \mathrm{o}$) $\to \mathrm{o}, \mathrm{xx}$: $\mathrm{i} \to$ o: ((xw@xr) $\Rightarrow$ (xw@$\lambda \mathrm{xt}$: $\mathrm{i} \to \mathrm{o}$: ($\mathrm{xr}$@xt or $\mathrm{xt} = \mathrm{xx}$)))) $\Rightarrow$ (xw@d)) and $\forall \mathrm{xx}$: $\mathrm{i} \to \mathrm{o}$: (($d$@xx) $\Rightarrow$ (c@xx)) and $\forall \mathrm{xx}$: i: $\exists y$: $\mathrm{i} \to \mathrm{o}$: ($d$@$y$ and y@xx))) and $\forall x$: $\mathrm{i} \to \mathrm{o}, y$: $\mathrm{i} \to \mathrm{o}$: (($\mathrm{cL}$@$x$ and cL@y) $\Rightarrow$ ($\forall \mathrm{xx}$: i: ((x@xx) $\Rightarrow$ (y@xx)) or $\forall \mathrm{xx}$: i: ((y@xx) $\Rightarrow$ (x@xx)))) and $\forall y$: $\mathrm{i} \to$ o: ((cL@y) $\Rightarrow$ $\exists \mathrm{xx}$: i: (y@xx)) and $\forall y$: $\mathrm{i} \to$ o: ((cL@y) $\Rightarrow$ (cG@$\lambda \mathrm{xx}$: i: $\neg$ y@xx))) $\Rightarrow$ $\exists \mathrm{xa}$: i: $\forall y$: $\mathrm{i} \to$ o: ((cL@y) $\Rightarrow$ (y@xa)) thf(cTHM628_pme, conjecture)

SEV271^5.p TPS problem from TOPOLOGY-THMS
b: tType thf(b_type, type)
a: tType thf(a_type, type)
$\forall s$: ($b \to$ o) $\to \mathrm{o}, t$: ($a \to$ o) $\to$ o: (($\forall r$: $a \to$ o: ($r = (\lambda \mathrm{xx}$: a: false) $\Rightarrow$ (t@r)) and $\forall r$: $a \to$ o: ($r = (\lambda \mathrm{xx}$: a: $\neg \mathrm{false}$) $\Rightarrow$ (t@r)) and $\forall k$: ($a \to$ o) $\to \mathrm{o}, r$: $a \to$ o: (($\forall \mathrm{xx}$: $a \to$ o: ((k@xx) $\Rightarrow$ (t@xx)) and $r = (\lambda \mathrm{xx}$: a: $\exists s_0$: $a \to$ o: (k@s_0 and s_0@xx))) $\Rightarrow$ (t@r)) and $\forall y$: $a \to \mathrm{o}, z$: $a \to \mathrm{o}, s_0$: $a \to$ o: ((t@y and t@z and $s_0 = (\lambda \mathrm{xx}$: a: (y@xx and z@xx))) $\Rightarrow$ (t@s_0)) and $\forall r$: $b \to$ o: ($r = (\lambda \mathrm{xx}$: b: false) $\Rightarrow$ (s@r)) and $\forall r$: $b \to$ o: ($r = (\lambda \mathrm{xx}$: b: $\neg \mathrm{false}$) $\Rightarrow$ (s@r)) and $\forall k$: ($b \to$ o) $\to \mathrm{o}, r$: $b \to$ o: (($\forall \mathrm{xx}$: $b \to$ o: ((k@xx) $\Rightarrow$ (s@xx)) and $r = (\lambda \mathrm{xx}$: b: $\exists s_0$: $b \to$ o: (k@s_0 and s_0@xx))) $\Rightarrow$ (s@r)) and $\forall y$: $b \to \mathrm{o}, z$: $b \to \mathrm{o}, s_0$: $b \to$ o: ((s@y and s@z and $s_0 = (\lambda \mathrm{xx}$: b: (y@xx and z@xx))) $\Rightarrow$ (s@s_0))) $\Rightarrow$ $\forall f$: $b \to a$: ($\forall x$: $a \to$ o: ((t@x) $\Rightarrow$ $\forall y$: $b \to$ o: ($y = (\lambda \mathrm{xb}$: b: (x@(f@xb))) $\Rightarrow$ (s@y))) $\iff \forall x$: $b \to \mathrm{o}, \mathrm{xx}$: a: ($\exists \mathrm{xt}$: b: ($\forall s_0$: $b \to$ o: (($\forall \mathrm{xx}_0$: b: ((x@xx_0) $\Rightarrow$ (s_0@xx_0)) and $\forall r$: $b \to$ o: ($r = (\lambda \mathrm{xx}_0$: b: $\neg$ s_0@xx_0) $\Rightarrow$ (s@r))) $\Rightarrow$ (s_0@xt)) and $\mathrm{xx} = (f$@xt)) $\Rightarrow$ $\forall s_0$: $a \to$ o: (($\forall \mathrm{xx}_0$: a: ($\exists \mathrm{xt}$: b: (x@xt and $\mathrm{xx}_0 = (f$@xt)) $\Rightarrow$ (s_0@xx_0)) and $\forall r$: $a \to$ o: ($r = (\lambda \mathrm{xx}_0$: a: $\neg$ s_0@xx_0) $\Rightarrow$ (t@r))) $\Rightarrow$ (s_0@xx))))) thf(cCLOSURE_THM2_pme, conjecture)

SEV272^5.p TPS problem X6007A
cSUCC: (($\mathrm{i} \to \mathrm{o}$) $\to \mathrm{o}$) $\to$ ($\mathrm{i} \to \mathrm{o}$) $\to$ o thf(cSUCC_type, type)
cZERO: ($\mathrm{i} \to \mathrm{o}$) $\to$ o thf(cZERO_type, type)
$\mathrm{cSUCC} = (\lambda \mathrm{xn}$: ($\mathrm{i} \to \mathrm{o}$) $\to \mathrm{o}, \mathrm{xp}$: $\mathrm{i} \to$ o: $\exists \mathrm{xx}$: i: (xp@xx and xn@$\lambda \mathrm{xt}$: i: ($\mathrm{xt} \neq \mathrm{xx}$ and xp@xt))) thf(cSUCC_def, def
$\mathrm{cZERO} = (\lambda \mathrm{xp}$: $\mathrm{i} \to$ o: $\neg \exists \mathrm{xx}$: i: (xp@xx)) thf(cZERO_def, definition)

$(\lambda n$: ($i → $o) → $o: ∀$p$: (($i → $o) → $o) → $o: (($p$@cZERO and ∀$x$: ($i → $o) → $o: (($p$@$x$) ⇒ ($p$@(cSUCC@$x$)))) ⇒ ($p$@$n$))) = ($\lambda$xx: ($i → $o) → $o: ∀$s$: (($i → $o) → $o) → $o: (($s$@cZERO and ∀$x$: ($i → $o) → $o: (($s$@$x$) ⇒ ($s$@(cSUCC@$x$)))) ⇒ ($s$@xx))) thf(cX6007A_pme, conjecture)

SEV273^5.p TPS problem THM542
A well-ordering is reflexive.
a: $tType thf(a_type, type)
cR: $a → a → $o thf(cR, type)
∀x: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (cR@xz@xx)) and ∀xy: a: ((x@xy and ∀xx: a: ((x@xx ⇒ (cR@xy@xx))) ⇒ xy = xz))) ⇒ ∀xx: a: (cR@xx@xx) thf(cTHM542_pme, conjecture)

SEV274^5.p TPS problem from WELL-ORD-THMS
a: $tType thf(a_type, type)
cR: $a → a → $o thf(cR, type)
∀x: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (cR@xz@xx)) and ∀xy: a: ((x@xy and ∀xx: a: ((x@xx ⇒ (cR@xy@xx))) ⇒ xy = xz))) ⇒ ∀xx: a, xy: a: (cR@xx@xy or cR@xy@xx) thf(cTHM543_pme, conjecture)

SEV275^5.p TPS problem from WELL-ORD-THMS
a: $tType thf(a_type, type)
∃xc: ($a → $o) → $a: ∀$x$: $a → $o: (∃xt: a: (x@xt) ⇒ (x@(xc@x))) ⇒ ∃r: $a → $a → $o: ∀$x$: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (r@xz@xx)) and ∀xy: a: ((x@xy and ∀xx: a: ((x@xx) ⇒ (r@xy@xx))) ⇒ xy = xz))) thf(cTHM550_pme, conjecture)

SEV276^5.p TPS problem from WELL-ORD-THMS
a: $tType thf(a_type, type)
cR: $a → a → $o thf(cR, type)
∀x: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (cR@xz@xx)) and ∀xy: a: ((x@xy and ∀xx: a: ((x@xx ⇒ (cR@xy@xx))) ⇒ xy = xz))) ⇒ ∀xx: a, xy: a: ((cR@xx@xy and cR@xy@xx) ⇒ xx = xy) thf(cTHM544_pme, conjectur

SEV277^5.p TPS problem from WELL-ORD-THMS
a: $tType thf(a_type, type)
cR: $a → a → $o thf(cR, type)
∀x: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (cR@xz@xx)) and ∀xy: a: ((x@xy and ∀xx: a: ((x@xx ⇒ (cR@xy@xx))) ⇒ xy = xz))) ⇒ ∀xx: a, xy: a, xz: a: ((cR@xx@xy and cR@xy@xz) ⇒ (cR@xx@xz)) thf(cTHM545_pme

SEV278^5.p TPS problem from WELL-ORD-THMS
a: $tType thf(a_type, type)
∀xg: (($a → $o) → $a) → $a → $o: (∀xh: ($a → $o) → $a: ∃xu: a: (xg@xh@xu) ⇒ ∃xf: ($a → $o) → $a: (xg@xf@(xf@(xg@xf)))) ⇒ ∃r: $a → $a → $o: ∀$x$: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (r@xz@xx)) and ∀xy: a: ((x@xy and (r@xy@xx))) ⇒ xy = xz))) thf(cTHM562_pme, conjecture)

SEV279^5.p TPS problem from WELL-ORD-THMS
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
h: ($b → $o) → $a thf($h$, type)
cW: ($b → $o) → $o thf(cW, type)
(∀u: ($b → $o) → $o: ((∃$z$: $b → $o: ($u$@$z$) and ∀xx: $b → $o: (($u$@xx) ⇒ (cW@xx))) ⇒ (cW@$\lambda$xx: b: ∀s: $b → $o: (($u$@$s$) ⇒ ($s$@xx)))) and ∀xx: a: ∃v: $b → $o: (cW@$v$ and xx = (h@v))) ⇒ ∃r: $a → $a → $o: ∀$x$: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (r@xz@xx)) and ∀xy: a: ((x@xy and ∀xx: a: ((x@xx) ⇒ (r@xy@xx))) ⇒ xy = xz))) thf(cLEM562A_pme, conjecture)

SEV280^5.p TPS problem from WELL-ORD-THMS
a: $tType thf(a_type, type)
cR: $a → a → $o thf(cR, type)
∀x: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (cR@xz@xx)) and ∀xy: a: ((x@xy and ∀xx: a: ((x@xx ⇒ (cR@xy@xx))) ⇒ xy = xz))) ⇒ (∀xx: a, xy: a, xz: a: ((cR@xx@xy and cR@xy@xz) ⇒ (cR@xx@xz)) and ∀xx: a: (cR@xx@xx = xy) and ∀xx: a, xy: a: (cR@xx@xy or cR@xy@xx)) thf(cTHM546_pme, conjecture)

SEV281^5.p TPS problem from WELL-ORD-THMS
a: $tType thf(a_type, type)
cR: $a → a → $o thf(cR, type)
(∃w: $a → $a → $o: ∀$x$: $a → $o: (∃xz: a: (x@xz) ⇒ ∃xz: a: (x@xz and ∀xx: a: ((x@xx) ⇒ (w@xz@xx)) and ∀xy: a: ((x@xy and (w@xy@xx))) ⇒ xy = xz))) and ∀xx: a, xy: a, xz: a: ((cR@xx@xy and cR@xy@xz) ⇒ (cR@xx@xz)) and ∀xx: a: (cR@xx@xx = xy)) ⇒ ∃s: $a → $o: (∀xx: a, xy: a: ((s@xx and s@xy) ⇒ (cR@xx@xy or cR@xy@xx)) and ∀t: $a →

$o: ((∀xx: a, xy: a: ((t@xx and t@xy) ⇒ (cR@xx@xy or cR@xy@xx)) and ∀xx: a: ((s@xx) ⇒ (t@xx))) ⇒ ∀xx: a: ((t@xx) ⇒ (s@xx)))) thf(cTHM548_pme, conjecture)

SEV282^5.p TPS problem TTTP6100
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: ((($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒ (xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
cNAT@cZERO thf($cTTTP_{6100}$, conjecture)

SEV285^5.p TPS problem from TTTP-NATS-THMS
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
∀f: a → b, g: a → b: (∀a: a: (f@a) = (g@a) ⇒ f = g) thf(cEE_eq_, conjecture)

SEV286^5.p TPS problem from TTTP-NATS-THMS
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
∀f: a → b, a: a, b: a: (a = b ⇒ (f@a) = (f@b)) thf(cEC_eq_, conjecture)

SEV288^5.p TPS problem from TTTP-NATS-THMS
a: $tType thf(a_type, type)
(λx: a, y: a: ∀xq: a → $o: ((xq@x) ⇒ (xq@y))) = (λx: a, y: a: x = y) thf(cE1_eq__pme, conjecture)

SEV289^5.p TPS problem TTTP6101
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: ((($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒ (xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
∀xx: ($i → $o) → $o: ((cNAT@xx) ⇒ (cNAT@(cSUCC@xx))) thf($cTTTP_{6101}$, conjecture)

SEV290^5.p TPS problem BLEDSOE1
c_0: ($i → $o) → $o thf(c0_type, type)
cSUCC: ((($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
c_less__eq_: ((($i → $o) → $o) → (($i → $o) → $o) → $o thf(c_less__eq__type, type)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
c_less__eq_ = (λxx: ($i → $o) → $o, xy: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@xx and ∀xz: ($i → $o) → $o: ((xp@xz) ⇒ (xp@(cSUCC@xz)))) ⇒ (xp@xy))) thf(c_less__eq__def, definition)
∃a: ((($i → $o) → $o) → $o: ∀xx: ($i → $o) → $o: ((a@xx) ⇒ (c_less__eq_@xx@c_0)) thf($cBLEDSOE_1$, conjecture)

SEV291^5.p TPS problem THM130-B
r: ((($i → $o) → $o) → (($i → $o) → $o) → $o thf(r_type, type)
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: ((($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒ (xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
(r@cZERO@cZERO and ∀xx: ($i → $o) → $o, xy: ($i → $o) → $o: ((r@xx@xy) ⇒ (r@(cSUCC@xx)@(cSUCC@xy)))) ⇒ ∀xx: ($i → $o) → $o: ((cNAT@xx) ⇒ ∃xy: ($i → $o) → $o: (r@xx@xy)) thf(cTHM130_B, conjecture)

SEV292^5.p TPS problem BLEDSOE7A
cP: ((($i → $o) → $o) → $o thf(cP_type, type)
cONE: ($i → $o) → $o thf(cONE_type, type)
cSUCC: ((($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
c_less__eq_: ((($i → $o) → $o) → (($i → $o) → $o) → $o thf(c_less__eq__type, type)

cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cONE = (cSUCC@cZERO) thf(cONE_def, definition)
c_less__eq_ = (λxx: ($i → $o) → $o, xy: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@xx and ∀xz: ($i → $o) →
$o: ((xp@xz) ⇒ (xp@(cSUCC@xz)))) ⇒ (xp@xy))) thf(c_less__eq__def, definition)
(cP@cONE) ⇒ ∃xx: ($i → $o) → $o: (c_less__eq_@cZERO@xx and c_less__eq_@xx@(cSUCC@cONE) and cP@xx) thf(cB

SEV293^5.p TPS problem X6101
cONE: ($i → $o) → $o thf(cONE_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cONE = (cSUCC@cZERO) thf(cONE_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cONE = (λp: $i → $o: ∃xy: $i: p = (λxx: $i, xy: $i: xx = xy@xy)) thf(cX6101_pme, conjecture)

SEV294^5.p TPS problem TTTP6102
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒
(xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((cNAT@xx) ⇒ ((xp@xx) ⇒ (xp@(cSUCC@xx))))) =
∀xm: ($i → $o) → $o: ((cNAT@xm) ⇒ (xp@xm))) thf(cTTTP$_{6102}$, conjecture)

SEV295^5.p TPS problem THM130-NAT
r: (($i → $o) → $o) → (($i → $o) → $o) → $o thf(r_type, type)
cINDUCTION: $o thf(cINDUCTION_type, type)
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒
(xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
cINDUCTION = (∀p: (($i → $o) → $o) → $o: ((p@cZERO and ∀x: ($i → $o) → $o: ((p@x) ⇒ (p@(cSUCC@x)))) ⇒
∀m: ($i → $o) → $o: ((cNAT@m) ⇒ (p@m)))) thf(cINDUCTION_def, definition)
(cINDUCTION and r@cZERO@cZERO and ∀xx: ($i → $o) → $o, xy: ($i → $o) → $o: ((r@xx@xy) ⇒ (r@(cSUCC@xx)@(c
∀xx: ($i → $o) → $o: ((cNAT@xx) ⇒ ∃xy: ($i → $o) → $o: (r@xx@xy)) thf(cTHM130_NAT, conjecture)

SEV296^5.p TPS problem from TTTP-NATS-THMS
c_plus: (($i → $o) → $o) → (($i → $o) → $o) → ($i → $o) → $o thf(c_plus_type, type)
c_star: (($i → $o) → $o) → (($i → $o) → $o) → ($i → $o) → $o thf(c_star_type, type)
cONE: ($i → $o) → $o thf(cONE_type, type)
cPLUS_AXIOMS: $o thf(cPLUS_AXIOMS_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cTIMES_AXIOMS: $o thf(cTIMES_AXIOMS_type, type)
cTWO: ($i → $o) → $o thf(cTWO_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cONE = (cSUCC@cZERO) thf(cONE_def, definition)
cTWO = (cSUCC@cONE) thf(cTWO_def, definition)
cPLUS_AXIOMS = (∀x: ($i → $o) → $o: (c_plus@x@cZERO) = x and ∀x: ($i → $o) → $o, y: ($i → $o) →
$o: (c_plus@x@(cSUCC@y)) = (cSUCC@(c_plus@x@y))) thf(cPLUS_AXIOMS_def, definition)
cTIMES_AXIOMS = (∀x: ($i → $o) → $o: (c_star@x@cZERO) = cZERO and ∀x: ($i → $o) → $o, y: ($i → $o) →
$o: (c_star@x@(cSUCC@y)) = (c_plus@(c_star@x@y)@y)) thf(cTIMES_AXIOMS_def, definition)
(cPLUS_AXIOMS and cTIMES_AXIOMS) ⇒ (c_star@cTWO@cTWO) = (c_plus@cTWO@cTWO) thf(cFOUR_THEOR

SEV297^5.p TPS problem from TTTP-NATS-THMS

cB: $i → $o thf(cB_type, type)
cC: $i → $o thf(cC_type, type)
cFINITE: ($i → $o) → $o thf(cFINITE_type, type)
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒ (xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
cFINITE = (λxp: $i → $o: ∃xn: ($i → $o) → $o: (cNAT@xn and xn@xp)) thf(cFINITE_def, definition)
(cFINITE@cC and ∀xx: $i: ((cB@xx) ⇒ (cC@xx))) ⇒ (cFINITE@cB) thf(cTHM531B_pme, conjecture)

SEV298^5.p TPS problem from TTTP-NATS-THMS
c_0: ($i → $o) → $o thf(c0_type, type)
c_1: ($i → $o) → $o thf(c1_type, type)
c_2: ($i → $o) → $o thf(c2_type, type)
cP: (($i → $o) → $o) → $o thf(cP_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
c_less__eq_: (($i → $o) → $o) → (($i → $o) → $o) → $o thf(c_less__eq__type, type)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
c_less__eq_ = (λxx: ($i → $o) → $o, xy: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@xx and ∀xz: ($i → $o) → $o: ((xp@xz) ⇒ (xp@(cSUCC@xz)))) ⇒ (xp@xy))) thf(c_less__eq__def, definition)
(cP@c_1) ⇒ ∃xx: ($i → $o) → $o: (c_less__eq_@$c_0$@xx and c_less__eq_@xx@$c_2$ and cP@xx) thf(cBLEDSOE$_7$, conjecture)

SEV299^5.p TPS problem from TTTP-NATS-THMS
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒ (xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
∀p: (($i → $o) → $o) → $o: (($p$@cZERO and ∀$x$: ($i → $o) → $o: (($p$@$x$) ⇒ ($p$@(cSUCC@$x$)))) ⇒ ∀$m$: ($i → $o) → $o: ((cNAT@$m$) ⇒ ($p$@$m$))) thf(cINDUCTION, conjecture)

SEV300^5.p TPS problem from TTTP-NATS-THMS
cONE: ($i → $o) → $o thf(cONE_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cONE = (cSUCC@cZERO) thf(cONE_def, definition)
∀xf: $i → $i, xg: $i → $i: (∀xx: $i: (xf@xx) = (xg@xx) ⇒ xf = xg) ⇒ cONE = (λp: $i → $o: ∃xy: $i: p = (λxx: $i, xy: $i: xx = xy@xy)) thf(cX6101_EXT_pme, conjecture)

SEV301^5.p TPS problem from TTTP-NATS-THMS
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒ (xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((cNAT@xx) ⇒ ((xp@xx) ⇒ (xp@(cSUCC@xx))))) ⇒
∀xm: ($i → $o) → $o: (∀xp$_0$: (($i → $o) → $o) → $o: ((xp$_0$@cZERO and ∀xx: ($i → $o) → $o: ((xp$_0$@xx) ⇒ (xp$_0$@(cSUCC@xx)))) ⇒ (xp$_0$@xm)) ⇒ (xp@xm))) thf(cX6102_A, conjecture)

SEV302^5.p TPS problem from TTTP-NATS-THMS
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)

cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒ (xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((cNAT@xx) ⇒ ((xp@xx) ⇒ (xp@(cSUCC@xx))))) =
∀xm: ($i → $o) → $o: (((cNAT@cZERO and xp@cZERO and ∀xx: ($i → $o) → $o: ((cNAT@xx and xp@xx) ⇒ (cNAT@(cSUCC@xx) and xp@(cSUCC@xx)))) ⇒ (cNAT@xm and xp@xm)) ⇒ (xp@xm))) thf(cX6102_B, conjecture)

SEV303∧5.p TPS problem from TTTP-NATS-THMS
cNAT: (($i → $o) → $o) → $o thf(cNAT_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cNAT = (λxn: ($i → $o) → $o: ∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((xp@xx) ⇒ (xp@(cSUCC@xx)))) ⇒ (xp@xn))) thf(cNAT_def, definition)
∀xp: (($i → $o) → $o) → $o: ((xp@cZERO and ∀xx: ($i → $o) → $o: ((cNAT@xx) ⇒ ((xp@xx) ⇒ (xp@(cSUCC@xx))))) =
∀xm: ($i → $o) → $o: (((∀$xp_0$: (($i → $o) → $o) → $o: (($xp_0$@cZERO and ∀xx: ($i → $o) → $o: (($xp_0$@xx) ⇒ ($xp_0$@(cSUCC@xx)))) ⇒ ($xp_0$@cZERO)) and xp@cZERO and ∀xx: ($i → $o) → $o: ((∀$xp_0$: (($i → $o) → $o) → $o: (($xp_0$@cZERO and ∀$xx_0$: ($i → $o) → $o: (($xp_0$@$xx_0$) ⇒ ($xp_0$@(cSUCC@$xx_0$)))) ⇒ ($xp_0$@xx)) and xp@xx) ⇒ (∀$xp_0$: (($i → $o) → $o) → $o: (($xp_0$@cZERO and ∀$xx_0$: ($i → $o) → $o: (($xp_0$@$xx_0$) ⇒ ($xp_0$@(cSUCC@$xx_0$)))) ⇒ ($xp_0$@(cSUCC@xx))) and xp@(cSUCC@xx)))) ⇒ (cNAT@xm and xp@xm)) ⇒ (xp@xm))) thf(cX6102_C, conjecture)

SEV304∧5.p TPS problem from TTTP-NATS-THMS
cONE: ($i → $o) → $o thf(cONE_type, type)
cSUCC: (($i → $o) → $o) → ($i → $o) → $o thf(cSUCC_type, type)
cZERO: ($i → $o) → $o thf(cZERO_type, type)
cZERO = (λxp: $i → $o: ¬ ∃xx: $i: (xp@xx)) thf(cZERO_def, definition)
cSUCC = (λxn: ($i → $o) → $o, xp: $i → $o: ∃xx: $i: (xp@xx and xn@λxt: $i: (xt ≠ xx and xp@xt))) thf(cSUCC_def, def
cONE = (cSUCC@cZERO) thf(cONE_def, definition)
∀k: $i → $i → $o, s: $i → $o: ((∃xs: $i → $i → $o: (∀xx: $i: (($s$@xx) ⇒ (cSUCC@(cSUCC@(cSUCC@(cSUCC@(cSUCC@cO
$o: ((cSUCC@(cSUCC@(cSUCC@(cSUCC@(cSUCC@cONE))))@xy) ⇒ ∃xy_0: $i: (λxx: $i: ($s$@xx and xy = (xs@xx))) = (λxx: $i, xy: $i: xx = xy@$xy_0$))) and ∀xx: $i, xy: $i: (($k$@xx@xy) ⇒ ($k$@xy@xx))) ⇒ ∃xx: $i, xy: $i, xz: $i: ($s$@x
xy and xy ≠ xz and xz ≠ xx and ((k@xx@xy and k@xy@xz and k@xx@xz) or (¬ k@xx@xy and ¬ k@xy@xz and ¬ k@xx@xz

SEV305∧5.p TPS problem THM2
This is a fixed point theorem for sets. Assume K is a monotonic operator on sets with respect to inclusion and conclude that K has a fixed point. Taken from [Kol67]. Related to the Knaster- Tarski theorem.
∀k: ($i → $o) → $i → $o: (∀xx: $i → $o, xy: $i → $o: (∀$xx_0$: $i: ((xx@$xx_0$) ⇒ (xy@$xx_0$)) ⇒ ∀$xx_0$: $i: (($k$@xx@$xx_0$) ⇒ ($k$@xy@$xx_0$))) ⇒ ∃xu: $i → $o: ∀xx: $i: (($k$@xu@xx) ⟺ (xu@xx))) thf(cTHM2_pme, conjecture)

SEV305∧6.p TPS problem THM2E
Related to the Knaster-Tarski theorem.
cK: ($i → $o) → $i → $o thf(cK, type)
∀x: $i → $o, y: $i → $o: (∀xx: $i: (($x$@xx) ⇒ ($y$@xx)) ⇒ ∀xx: $i: ((cK@$x$@xx) ⇒ (cK@$y$@xx))) ⇒ ∃$u$: $i → $o: ∀xx: $i: ((cK@$u$@xx) ⟺ ($u$@xx)) thf(cTHM2E_pme, conjecture)

SEV306∧5.p TPS problem THM2F
Related to the Knaster-Tarski theorem.
cK: ($i → $o) → $i → $o thf(cK, type)
∀x: $i → $o, y: $i → $o: (∀xx: $i: (($x$@xx) ⇒ ($y$@xx)) ⇒ ∀xx: $i: ((cK@$x$@xx) ⇒ (cK@$y$@xx))) ⇒ ∃$u$: $i → $o: (cK@$u$) = u thf(cTHM2F_pme, conjecture)

SEV308∧5.p TPS problem THM1A
Related to the Knaster-Tarski theorem.
∀k: ($i → $o) → $i → $o: (∃$x$: $i → $o, y: $i → $o: (∀xx: $i: (($x$@xx) ⇒ ($y$@xx)) and ¬ ∀xx: $i: (($k$@$x$@xx) ⇒ ($k$@$y$@xx))) or ∃$u$: $i → $o: ($k$@$u$) = u) thf(cTHM1A_pme, conjecture)

SEV309∧5.p TPS problem THM1
Related to the Knaster-Tarski theorem.
∀p: $i → $o, q: $i → $o: ∃$x$: $i: ((($p$@$x$) ⟺ ($q$@$x$)) ⇒ $p = q$) ⇒ ∀k: ($i → $o) → $i → $o: (∃$x$: $i → $o, y: $i → $o: (∀xx: $i: (($x$@xx) ⇒ ($y$@xx)) and ¬ ∀xx: $i: (($k$@$x$@xx) ⇒ ($k$@$y$@xx))) or ∃$u$: $i → $o: ($k$@$u$) = u) thf(cTHM1_pme, conjecture)

SEV310^5.p TPS problem from SET-KNASTER-TARSKI-INST
Related to the Knaster-Tarski theorem.
a: $tType thf(a_type, type)
cK: $(a \to \$o) \to a \to \$o$ thf(cK, type)
$\forall x$: $a \to \$o, y$: $a \to \$o$: ($\forall$xx: a: ((x@xx) $\Rightarrow$ (y@xx)) $\Rightarrow$ $\forall$xx: a: ((cK@x@xx) $\Rightarrow$ (cK@y@xx))) $\Rightarrow$ $\forall$xx: a: ($\forall s$: $a \to$ $o: ($\forall$xx$_0$: a: ((cK@s@xx$_0$) $\Rightarrow$ (s@xx$_0$)) $\Rightarrow$ (s@xx)) $\Rightarrow$ (cK@λxx$_0$: a: $\forall s$: $a \to$ $o: ($\forall$xx$_1$: a: ((cK@s@xx$_1$) $\Rightarrow$ (s@xx$_1$)) $\Rightarrow$ (s@xx$_0$))@xx)) thf(cTHM90A_pme, conjecture)

SEV311^5.p TPS problem from SET-KNASTER-TARSKI-INST
Related to the Knaster-Tarski theorem.
a: $tType thf(a_type, type)
cF: $(a \to \$o) \to a \to \$o$ thf(cF, type)
$\forall x$: $a \to \$o, y$: $a \to \$o$: ($\forall$xx: a: ((x@xx) $\Rightarrow$ (y@xx)) $\Rightarrow$ $\forall$xx: a: ((cF@x@xx) $\Rightarrow$ (cF@y@xx))) $\Rightarrow$ $\forall$xx: a: ((cF@λxx$_0$: a: $\forall s$: $a \to$ $o: ($\forall$xx$_1$: a: ((cF@s@xx$_1$) $\Rightarrow$ (s@xx$_1$)) $\Rightarrow$ (s@xx$_0$))@xx) $\Rightarrow$ $\forall s$: $a \to$ $o: ($\forall$xx$_0$: a: ((cF@s@xx$_0$) $\Rightarrow$ (s@xx$_0$)) $\Rightarrow$ (s@xx))) thf(cTHM521_pme, conjecture)

SEV312^5.p TPS problem from SET-KNASTER-TARSKI
Related to the Knaster-Tarski theorem.
$\forall k$: ($i \to $o) \to $i \to $o: (($\forall$xx: $i \to $o, xy: $i \to $o: ($\forall$xx$_0$: $i: ((xx@xx$_0$) $\Rightarrow$ (xy@xx$_0$)) $\Rightarrow$ $\forall$xx$_0$: $i: (($k$@xx@xx$_0$) $\Rightarrow$ (k@xy@xx$_0$))) and $\forall$xx: $i \to $o, xy: $i \to $o: ($\forall$xx$_0$: $i: ((xx@xx$_0$) $\Rightarrow$ (xy@xx$_0$)) $\Rightarrow$ $\forall$xx$_0$: $i: (($k$@xx@xx$_0$) $\Rightarrow$ (k@xy@xx$_0$)))) $\Rightarrow$ $\exists$xu: $i \to $o: $\forall$xx: $i: (($k$@xu@xx) $\iff$ (xu@xx))) thf(cTHM2_B_pme, conjecture)

SEV313^5.p TPS problem from CLOS-SYS-FP-THMS
Related to the Knaster-Tarski theorem.
a: $tType thf(a_type, type)
cF: $(a \to \$o) \to a \to \$o$ thf(cF, type)
cCL: $(a \to \$o) \to \$o$ thf(cCL, type)
($\forall s$: ($a \to \$o) \to \$o: ($\forall$xx: $a \to \$o: ((s@xx) $\Rightarrow$ (cCL@xx)) $\Rightarrow$ (cCL@λxx: a: $\forall s_0$: $a \to \$o: ((s@s_0) $\Rightarrow$ (s_0@xx)))) and $\forall r$: $a \to \$o: ((cCL@r) $\Rightarrow$ (cCL@(cF@r))) and $\forall r$: $a \to \$o, s$: $a \to \$o: ((cCL@r and cCL@s and $\forall$xx: a: ((r@x
(s@xx))) $\Rightarrow$ $\forall$xx: a: ((cF@r@xx) $\Rightarrow$ (cF@s@xx)))) $\Rightarrow$ $\exists x$: $a \to \$o: (cCL@x and (cF@x) = x and $\forall y$: $a \to$ $o: ((cCL@$y$ and (cF@y) = y) $\Rightarrow$ $\forall$xx: a: ((x@xx) $\Rightarrow$ (y@xx)))) thf(cFP_THM1_pme, conjecture)

SEV314^5.p TPS problem from CLOS-SYS-FP-THMS
Related to the Knaster-Tarski theorem.
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
cF: $(a \to b \to \$o) \to a \to b \to \$o$ thf(cF, type)
cCL: $(a \to b \to \$o) \to \$o$ thf(cCL, type)
($\forall s$: ($a \to b \to \$o) \to \$o: ($\forall$xx: $a \to b \to \$o: ((s@xx) $\Rightarrow$ (cCL@xx)) $\Rightarrow$ (cCL@λxa: a, xb: b: $\forall r$: $a \to b \to$ $o: (($s$@$r$) $\Rightarrow$ (r@xa@xb)))) and $\forall r$: $a \to b \to \$o: ((cCL@r) $\Rightarrow$ (cCL@(cF@r))) and $\forall r$: $a \to b \to \$o, s$: $a \to b \to$ $o: ((cCL@$r$ and cCL@s and $\forall$xa: a, xb: b: ((r@xa@xb) $\Rightarrow$ (s@xa@xb))) $\Rightarrow$ $\forall$xa: a, xb: b: ((cF@r@xa@xb) $\Rightarrow$ (cF@s@xa@xb)))) $\Rightarrow$ $\exists x$: $a \to b \to \$o: (cCL@x and (cF@x) = x and $\forall y$: $a \to b \to \$o: ((cCL@y and (cF@y) = y) $\Rightarrow$ $\forall$xa: a, xb: b: ((x@xa@xb) $\Rightarrow$ (y@xa@xb)))) thf(cFP_THM2_pme, conjecture)

SEV315^5.p TPS problem from CLOS-SYS-FP-THMS
Related to the Knaster-Tarski theorem.
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
c: $tType thf(c_type, type)
cF: $(a \to b \to c \to \$o) \to a \to b \to c \to \$o$ thf(cF, type)
cCL: $(a \to b \to c \to \$o) \to \$o$ thf(cCL, type)
($\forall s$: ($a \to b \to c \to \$o) \to \$o: ($\forall$xx: $a \to b \to c \to \$o: ((s@xx) $\Rightarrow$ (cCL@xx)) $\Rightarrow$ (cCL@λxa: a, xb: b, xc: c: $\forall r$: $a \to b \to c \to \$o: ((s@r) $\Rightarrow$ (r@xa@xb@xc)))) and $\forall r$: $a \to b \to c \to \$o: ((cCL@r) $\Rightarrow$ (cCL@(cF@r))) and $\forall r$: $a \to b \to c \to \$o, s$: $a \to b \to c \to \$o: ((cCL@r and cCL@s and $\forall$xa: a, xb: b, xc: c: ((r@xa@xb@xc) $\Rightarrow$ (s@xa@xb@xc))) $\Rightarrow$ $\forall$xa: a, xb: b, xc: c: ((cF@r@xa@xb@xc) $\Rightarrow$ (cF@s@xa@xb@xc)))) $\Rightarrow$ $\exists x$: $a \to b \to c \to \$o: (cCL@x and (cF@x) = x and $\forall y$: $a \to b \to c \to \$o: ((cCL@y and (cF@y) = y) $\Rightarrow$ $\forall$xa: a, xb: b, xc: c: ((x@xa@xb@xc) $\Rightarrow$ (y@xa@xb@xc)))) thf(

SEV316^5.p TPS problem from CLOS-SYS-FP-THMS
Related to the Knaster-Tarski theorem.
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
c: $tType thf(c_type, type)
cF: $(a \to b \to c \to \$o) \to a \to b \to c \to \$o$ thf(cF, type)

cCL: $(a \to b \to c \to \$o) \to \$o$ thf(cCL, type)
$(\forall s\colon (a \to b \to c \to \$o) \to \$o\colon (\forall xx\colon a \to b \to c \to \$o\colon ((s@xx) \Rightarrow (cCL@xx)) \Rightarrow (cCL@\lambda xa\colon a, xb\colon b, xc\colon c\colon \forall r\colon a \to b \to c \to \$o\colon ((s@r) \Rightarrow (r@xa@xb@xc))))$ and $\forall r\colon a \to b \to c \to \$o\colon ((cCL@r) \Rightarrow (cCL@(cF@r)))$ and $\forall r\colon a \to b \to c \to \$o, s\colon a \to b \to c \to \$o\colon ((cCL@r$ and $cCL@s$ and $\forall xa\colon a, xb\colon b, xc\colon c\colon ((r@xa@xb@xc) \Rightarrow (s@xa@xb@xc))) \Rightarrow \forall xa\colon a, xb\colon b, xc\colon c\colon ((cF@r@xa@xb@xc) \Rightarrow (cF@s@xa@xb@xc)))) \Rightarrow (cCL@\lambda xa\colon a, xb\colon b, xc\colon c\colon \forall r\colon a \to b \to c \to \$o\colon ((cCL@r$ and $\forall xa_0\colon a, xb_0\colon b, xc_0\colon c\colon ((cF@r@xa_0@xb_0@xc_0) \Rightarrow (r@xa_0@xb_0@xc_0))) \Rightarrow (r@xa@xb@xc))$ and $(cF@\lambda xa\colon a \to b \to c \to \$o\colon ((cCL@r$ and $\forall xa_0\colon a, xb_0\colon b, xc_0\colon c\colon ((cF@r@xa_0@xb_0@xc_0) \Rightarrow (r@xa_0@xb_0@xc_0))) \Rightarrow (r@xa@xb@xc))) = (\lambda xa\colon a, xb\colon b, xc\colon c\colon \forall r\colon a \to b \to c \to \$o\colon ((cCL@r$ and $\forall xa_0\colon a, xb_0\colon b, xc_0\colon c\colon ((cF@r@xa_0@xb_0@xc_0) \Rightarrow (r@xa_0@xb_0@xc_0))) \Rightarrow (r@xa@xb@xc)))$ and $\forall y\colon a \to b \to c \to \$o\colon ((cCL@y$ and $(cF@y) = y) \Rightarrow \forall xa\colon a, xb\colon b, xc\colon c\colon (\forall r\colon a \to b \to c \to \$o\colon ((cCL@r$ and $\forall xa_0\colon a, xb_0\colon b, xc_0\colon c\colon ((cF@r@xa_0@xb_0@xc_0) \Rightarrow (r@xa_0@xb_0@xc_0))) \Rightarrow (r@xa@xb@xc)) \Rightarrow (y@xa@xb@xc))))$ thf(cFP_THM3_INST_pme, conjecture)

SEV317^5.p TPS problem THM145-A
Related to the Knaster-Tarski theorem.
a: \$tType thf(a_type, type)
$\forall r\colon a \to a \to \$o, u\colon (a \to \$o) \to a\colon ((\forall xx\colon a, xy\colon a, xz\colon a\colon ((r@xx@xy$ and $r@xy@xz) \Rightarrow (r@xx@xz))$ and $\forall xs\colon a \to \$o\colon (\forall xz\colon a\colon ((xs@xz) \Rightarrow (r@xz@(u@xs)))$ and $\forall xz\colon a\colon ((xs@xz) \Rightarrow (r@xz@(u@xs)))$ and $\forall xj\colon a\colon (\forall xk\colon a\colon ((xs@xk$ and $xs@xk (r@xk@xj)) \Rightarrow (r@(u@xs)@xj$ and $r@(u@xs)@xj)))) \Rightarrow \forall xf\colon a \to a\colon ((\forall xx\colon a, xy\colon a\colon ((r@xx@xy) \Rightarrow (r@(xf@xx)@(xf@xy)))$ $(r@(xf@xx)@(xf@xy)))) \Rightarrow \exists xw\colon a\colon (r@xw@(xf@xw)$ and $r@(xf@xw)@xw)))$ thf(cTHM145_A_pme, conjecture)

SEV318^5.p TPS problem THM145-B
Related to the Knaster-Tarski theorem.
a: \$tType thf(a_type, type)
$\forall r\colon a \to a \to \$o, u\colon (a \to \$o) \to a\colon ((\forall xx\colon a, xy\colon a, xz\colon a\colon ((r@xx@xy$ and $r@xy@xz) \Rightarrow (r@xx@xz))$ and $\forall xs\colon a \to \$o\colon (\forall xz\colon a\colon ((xs@xz) \Rightarrow (r@xz@(u@xs)))$ and $\forall xz\colon a\colon ((xs@xz) \Rightarrow (r@xz@(u@xs)))$ and $\forall xj\colon a\colon (\forall xk\colon a\colon ((xs@xk) \Rightarrow (r@xk@xj)) \Rightarrow (r@(u@xs)@xj)))) \Rightarrow \forall xf\colon a \to a\colon ((\forall xx\colon a, xy\colon a\colon ((r@xx@xy) \Rightarrow (r@(xf@xx)@(xf@xy)))$ and $\forall xx\colon a, xy\colon a\colon (r@(xf@xx)@(xf@xy)))) \Rightarrow \exists xw\colon a\colon (r@xw@(xf@xw)$ and $r@(xf@xw)@xw)))$ thf(cTHM145_B_pme, conjecture)

SEV319^5.p TPS problem THM145L
Tarski's (actually Knaster's) Fixed Point Theorem for lattices: In a complete lattice, every monotone function has a fixed point.
a: \$tType thf(a_type, type)
$\forall l\colon a \to a \to \$o, u\colon (a \to \$o) \to a\colon ((\forall xx\colon a, xy\colon a, xz\colon a\colon ((l@xx@xy$ and $l@xy@xz) \Rightarrow (l@xx@xz))$ and $\forall xs\colon a \to \$o\colon (\forall xz\colon a\colon ((xs@xz) \Rightarrow (l@xz@(u@xs)))$ and $\forall xj\colon a\colon (\forall xk\colon a\colon ((xs@xk) \Rightarrow (l@xk@xj)) \Rightarrow (l@(u@xs)@xj)))) \Rightarrow \forall xf\colon a \to a\colon (\forall xx\colon a, xy\colon a\colon ((l@xx@xy) \Rightarrow (l@(xf@xx)@(xf@xy))) \Rightarrow \exists xw\colon a\colon (l@xw@(xf@xw)$ and $l@(xf@xw)@xw)))$ th

SEV319^6.p TPS problem THM145L1
Related to the Knaster-Tarski theorem.
a: \$tType thf(a_type, type)
$cLQ\colon a \to a \to \$o$ thf(cLQ, type)
$\forall u\colon (a \to \$o) \to a\colon ((\forall xx\colon a, xy\colon a, xz\colon a\colon ((cLQ@xx@xy$ and $cLQ@xy@xz) \Rightarrow (cLQ@xx@xz))$ and $\forall xs\colon a \to \$o\colon (\forall xz\colon a\colon ((xs@xz) \Rightarrow (cLQ@xz@(u@xs)))$ and $\forall xj\colon a\colon (\forall xk\colon a\colon ((xs@xk) \Rightarrow (cLQ@xk@xj)) \Rightarrow (cLQ@(u@xs)@xj)))) \Rightarrow \forall xf\colon a \to a\colon (\forall xx\colon a, xy\colon a\colon ((cLQ@xx@xy) \Rightarrow (cLQ@(xf@xx)@(xf@xy))) \Rightarrow \exists xw\colon a\colon (cLQ@xw@(xf@xw)$ and $cLQ@(xf@xw)$

SEV321^5.p TPS problem from KNASTER-TARSKI
Related to the Knaster-Tarski theorem.
a: \$tType thf(a_type, type)
$\forall r\colon a \to a \to \$o, u\colon (a \to \$o) \to a\colon ((\forall xx\colon a, xy\colon a, xz\colon a\colon ((r@xx@xy$ and $r@xy@xz) \Rightarrow (r@xx@xz))$ and $\forall xs\colon a \to \$o\colon (\forall xz\colon a\colon ((xs@xz) \Rightarrow (r@xz@(u@xs)))$ and $\forall xj\colon a\colon (\forall xk\colon a\colon ((xs@xk$ and $xs@xk) \Rightarrow (r@xk@xj)) \Rightarrow (r@(u@xs)@xj$ and $r@(u@xs)@xj)))) \Rightarrow \forall xf\colon a \to a\colon (\forall xx\colon a, xy\colon a\colon ((r@xx@xy) \Rightarrow (r@(xf@xx)@(xf@xy))) \Rightarrow \exists xw\colon a\colon (r@xw@(xf@xw)$ and $r@(xf@xw)@xw)))$ thf(cTHM145_C_pme, conjecture)

SEV322^5.p TPS problem from GVB-MB-AXIOMS
z: \$i thf(z, type)
cGVB_ZERO: \$i thf(cGVB_ZERO, type)
cGVB_IN: \$i → \$i → \$o thf(cGVB_IN, type)
$\neg$ cGVB_IN@z@cGVB_ZERO thf(cGVB_AX_ZERO, conjecture)

SEV323^5.p TPS problem from GVB-MB-AXIOMS
z: \$i thf(z, type)
cGVB_M: \$i → \$o thf(cGVB_M, type)
cGVB_V: \$i thf(cGVB_V, type)
cGVB_IN: \$i → \$i → \$o thf(cGVB_IN, type)

(cGVB_IN@z@cGVB_V) $\iff$ (cGVB_M@z) thf(cGVB_AX_V, conjecture)

SEV324^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
cGVB_NOP: $i → $i → $i thf(cGVB_NOP, type)
cGVB_SING: $i → $i thf(cGVB_SING, type)
(cGVB_SING@x) = (cGVB_NOP@x@x) thf(cGVB_AX_SING, conjecture)

SEV325^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
y: $i thf($y$, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
(cGVB_IN@x@y) $\Rightarrow$ (cGVB_M@x) thf(cGVB_A$_2$, conjecture)

SEV326^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
cGVB_SING: $i → $i thf(cGVB_SING, type)
cGVB_UNION: $i → $i → $i thf(cGVB_UNION, type)
cGVB_SUCC: $i → $i thf(cGVB_SUCC, type)
(cGVB_SUCC@x) = (cGVB_UNION@x@(cGVB_SING@x)) thf(cGVB_AX_SUCC, conjecture)

SEV327^5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
cGVB_SING_VAL: $i → $o thf(cGVB_SING_VAL, type)
cGVB_RELATION: $i → $o thf(cGVB_RELATION, type)
cGVB_FUNCTION: $i → $o thf(cGVB_FUNCTION, type)
(cGVB_FUNCTION@z) $\iff$ (cGVB_RELATION@z and cGVB_SING_VAL@z) thf(cGVB_AX_FUNCTION, conjecture

SEV328^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
x: $i thf($x$, type)
cGVB_V: $i thf(cGVB_V, type)
cGVB_CROSS: $i → $i → $i thf(cGVB_CROSS, type)
cGVB_INTERSECT: $i → $i → $i thf(cGVB_INTERSECT, type)
cGVB_RESTRICT: $i → $i → $i thf(cGVB_RESTRICT, type)
(cGVB_RESTRICT@x@y) = (cGVB_INTERSECT@x@(cGVB_CROSS@y@cGVB_V)) thf(cGVB_AX_RESTRICT, conje

SEV329^5.p TPS problem from GVB-MB-AXIOMS
f: $i thf($f$, type)
cGVB_CONVERSE: $i → $i thf(cGVB_CONVERSE, type)
cGVB_FUNCTION: $i → $o thf(cGVB_FUNCTION, type)
cGVB_ONE_ONE: $i → $o thf(cGVB_ONE_ONE, type)
(cGVB_ONE_ONE@f) $\iff$ (cGVB_FUNCTION@f and cGVB_FUNCTION@(cGVB_CONVERSE@f)) thf(cGVB_AX

SEV330^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
x: $i thf($x$, type)
cGVB_COMPLEMENT: $i → $i thf(cGVB_COMPLEMENT, type)
cGVB_INTERSECT: $i → $i → $i thf(cGVB_INTERSECT, type)
cGVB_UNION: $i → $i → $i thf(cGVB_UNION, type)
(cGVB_UNION@x@y) = (cGVB_COMPLEMENT@(cGVB_INTERSECT@(cGVB_COMPLEMENT@x)@(cGVB_COMPLE

SEV331^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
x: $i thf($x$, type)
cGVB_NOP: $i → $i → $i thf(cGVB_NOP, type)
cGVB_SING: $i → $i thf(cGVB_SING, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
(cGVB_OP@x@y) = (cGVB_NOP@(cGVB_SING@x)@(cGVB_NOP@x@y)) thf(cGVB_AX_OP, conjecture)

SEV332^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
x: $i thf($x$, type)
f: $i thf($f$, type)

cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_APPLY: $i → $i → $i thf(cGVB_APPLY, type)
$cGVB\_APP_2$: $i → $i → $i → $i thf($cGVB_APP_2$, type)
($cGVB\_APP_2$@f@x@y) = (cGVB_APPLY@f@(cGVB_OP@x@y)) thf($cGVB\_AX\_APP_2$, conjecture)

SEV333∧5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
z: $i thf($z$, type)
cGVB_SUBSET: $i → $i → $o thf(cGVB_SUBSET, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_POWERSET: $i → $i thf(cGVB_POWERSET, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
(cGVB_IN@z@(cGVB_POWERSET@x)) ⟺ (cGVB_M@z and cGVB_SUBSET@z@x) thf($cGVB\_C_3$, conjecture)

SEV334∧5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
z: $i thf($z$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_COMPLEMENT: $i → $i thf(cGVB_COMPLEMENT, type)
(cGVB_IN@z@(cGVB_COMPLEMENT@x)) ⟺ (cGVB_M@z and ¬ cGVB_IN@z@x) thf($cGVB\_B_3$, conjecture)

SEV335∧5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
x: $i thf($x$, type)
cGVB_SUBSET: $i → $i → $o thf(cGVB_SUBSET, type)
cGVB_PROP_SUBSET: $i → $i → $o thf(cGVB_PROP_SUBSET, type)
(cGVB_PROP_SUBSET@x@y) ⟺ (cGVB_SUBSET@x@y and $x \neq y$) thf(cGVB_AX_PROP_SUBSET, conjecture)

SEV336∧5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_RELATION: $i → $o thf(cGVB_RELATION, type)
(cGVB_RELATION@z) ⟺ ∀xx: $i: ((cGVB_M@xx) ⇒ ((cGVB_IN@xx@z) ⇒ (cGVB_OPP@xx))) thf(cGVB_AX_R

SEV337∧5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
cGVB_SECOND: $i → $i thf(cGVB_SECOND, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_ESTIN: $i thf(cGVB_ESTIN, type)
(cGVB_IN@z@cGVB_ESTIN) ⟺ (cGVB_M@z and cGVB_OPP@z and cGVB_IN@(cGVB_FIRST@z)@(cGVB_SECOND

SEV338∧5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
cGVB_SECOND: $i → $i thf(cGVB_SECOND, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_IDENT: $i thf(cGVB_IDENT, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
(cGVB_IN@z@cGVB_IDENT) ⟺ (cGVB_M@z and cGVB_OPP@z and (cGVB_FIRST@z) = (cGVB_SECOND@z))

SEV339∧5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
z: $i thf($z$, type)
x: $i thf($x$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)

cGVB_INTERSECT: $i → $i → $i thf(cGVB_INTERSECT, type)
(cGVB_IN@z@(cGVB_INTERSECT@x@y)) ⟺ (cGVB_M@z and cGVB_IN@z@x and cGVB_IN@z@y) thf(cGVB_B$_2$

SEV340^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
x: $i thf($x$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_SUBSET: $i → $i → $o thf(cGVB_SUBSET, type)
(cGVB_SUBSET@x@y) ⟺ ∀xu: $i: (cGVB_M@xu and ((cGVB_IN@xu@x) ⇒ (cGVB_IN@xu@y))) thf(cGVB_AX_SU

SEV341^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
f: $i thf($f$, type)
cGVB_CROSS: $i → $i → $i thf(cGVB_CROSS, type)
cGVB_MAPS: $i → $i → $i → $o thf(cGVB_MAPS, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_CLOSED: $i → $i → $o thf(cGVB_CLOSED, type)
(cGVB_CLOSED@x@f) ⟺ (cGVB_M@x and cGVB_M@f and cGVB_MAPS@f@(cGVB_CROSS@x@x)@x) thf(cGV

SEV342^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
u: $i thf($u$, type)
x: $i thf($x$, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_NOP: $i → $i → $i thf(cGVB_NOP, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
(cGVB_IN@u@(cGVB_NOP@x@y)) ⟺ (cGVB_M@u and ($u = x$ or $u = y$)) thf(cGVB_A$_4$, conjecture)

SEV343^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
x: $i thf($x$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
∀xu: $i: ((cGVB_M@xu) ⇒ ((cGVB_IN@xu@x) ⟺ (cGVB_IN@xu@y))) ⇒ $x = y$ thf(cGVB_A$_3$, conjecture)

SEV344^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
cGVB_DISJOINT: $i → $i → $o thf(cGVB_DISJOINT, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_ZERO: $i thf(cGVB_ZERO, type)
$x \neq$ cGVB_ZERO ⇒ ∃xu: $i: (cGVB_M@xu and cGVB_IN@xu@x and cGVB_DISJOINT@xu@x) thf(cGVB_D, conjectu

SEV345^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
f: $i thf($f$, type)
x: $i thf($x$, type)
cGVB_RANGE: $i → $i thf(cGVB_RANGE, type)
cGVB_SUBSET: $i → $i → $o thf(cGVB_SUBSET, type)
cGVB_DOMAIN: $i → $i thf(cGVB_DOMAIN, type)
cGVB_FUNCTION: $i → $o thf(cGVB_FUNCTION, type)
cGVB_MAPS: $i → $i → $i → $o thf(cGVB_MAPS, type)
(cGVB_MAPS@f@x@y) ⟺ (cGVB_FUNCTION@f and (cGVB_DOMAIN@f) = x and cGVB_SUBSET@(cGVB_RANG

SEV346^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
x: $i thf($x$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_DISJOINT: $i → $i → $o thf(cGVB_DISJOINT, type)
(cGVB_DISJOINT@x@y) ⟺ ∀xu: $i: ((cGVB_M@xu) ⇒ ¬ cGVB_IN@xu@x and cGVB_IN@xu@y) thf(cGVB_AX_D

SEV347^5.p TPS problem from GVB-MB-AXIOMS

x: $i thf($x$, type)
z: $i thf($z$, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
cGVB_SECOND: $i → $i thf(cGVB_SECOND, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_CONVERSE: $i → $i thf(cGVB_CONVERSE, type)
(cGVB_IN@z@(cGVB_CONVERSE@x)) ⟺ (cGVB_M@z and cGVB_OPP@z and cGVB_IN@(cGVB_OP@(cGVB_SECO

SEV348^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
(cGVB_OPP@x) ⟺ ∃xy: $i, xz: $i: (cGVB_M@xy and cGVB_M@xz and x = (cGVB_OP@xy@xz)) thf(cGVB_AX_OP

SEV349^5.p TPS problem from GVB-MB-AXIOMS
cGVB_SUCC: $i → $i thf(cGVB_SUCC, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_ZERO: $i thf(cGVB_ZERO, type)
cGVB_M: $i → $o thf(cGVB_M, type)
∃xy: $i: (cGVB_M@xy and cGVB_IN@cGVB_ZERO@xy and ∀xx: $i: ((cGVB_IN@xx@xy) ⇒ (cGVB_IN@(cGVB_SUCC@x

SEV350^5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
x: $i thf($x$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_SIGMA: $i → $i thf(cGVB_SIGMA, type)
(cGVB_IN@z@(cGVB_SIGMA@x)) ⟺ (cGVB_M@z and ∃xy: $i: (cGVB_M@xy and cGVB_IN@xy@x and cGVB_IN@z@

SEV351^5.p TPS problem from GVB-MB-AXIOMS
y: $i thf($y$, type)
z: $i thf($z$, type)
x: $i thf($x$, type)
cGVB_SECOND: $i → $i thf(cGVB_SECOND, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_CROSS: $i → $i → $i thf(cGVB_CROSS, type)
(cGVB_IN@z@(cGVB_CROSS@x@y)) ⟺ (cGVB_M@z and cGVB_OPP@z and cGVB_IN@(cGVB_FIRST@z)@x and cG

SEV352^5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
x: $i thf($x$, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_DOMAIN: $i → $i thf(cGVB_DOMAIN, type)
(cGVB_IN@z@(cGVB_DOMAIN@x)) ⟺ (cGVB_M@z and ∃xt: $i: (cGVB_M@xt and cGVB_OPP@xt and cGVB_IN@xt@
(cGVB_FIRST@xt))) thf(cGVB_B_4, conjecture)

SEV354^5.p TPS problem from GVB-MB-AXIOMS
g: $i thf($g$, type)
f: $i thf($f$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
cGVB_ITERATE: $i → $i → $o thf(cGVB_ITERATE, type)

(cGVB_ITERATE@f@g) $\iff$ ∀xp: $i: ((cGVB_IN@$f$@xp and ∀xj: $i: ((cGVB_IN@xj@xp) $\Rightarrow$ (cGVB_IN@(cGVB_COMPO
(cGVB_IN@g@xp)) thf(cGVB_AX_ITERATE, conjecture)

SEV355∧5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
x: $i thf($x$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_SECOND: $i → $i thf(cGVB_SECOND, type)
(cGVB_IN@z@(cGVB_SECOND@x)) $\iff$ (cGVB_M@z and ∃xu: $i, xv: $i: (cGVB_M@xu and cGVB_M@xv and x =
(cGVB_OP@xu@xv) and cGVB_IN@z@xv)) thf(cGVB_AX_SECOND, conjecture)

SEV356∧5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
x: $i thf($x$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
(cGVB_IN@z@(cGVB_FIRST@x)) $\iff$ (cGVB_M@z and ∃xu: $i, xv: $i: (cGVB_M@xu and cGVB_M@xv and x =
(cGVB_OP@xu@xv) and cGVB_IN@z@xu)) thf(cGVB_AX_FIRST, conjecture)

SEV357∧5.p TPS problem from GVB-MB-AXIOMS
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_ZERO: $i thf(cGVB_ZERO, type)
cGVB_FUNCTION: $i → $o thf(cGVB_FUNCTION, type)
∃xu: $i: (cGVB_FUNCTION@xu and ∀xx: $i: ((cGVB_M@xx and xx ≠ cGVB_ZERO) $\Rightarrow$ ∃xy: $i: (cGVB_M@xy and cGVB

SEV358∧5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
x: $i thf($x$, type)
f: $i thf($f$, type)
cGVB_SECOND: $i → $i thf(cGVB_SECOND, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_IMAGE: $i → $i → $i thf(cGVB_IMAGE, type)
(cGVB_IN@z@(cGVB_IMAGE@x@f)) $\iff$ (cGVB_M@z and ∃xy: $i: (cGVB_M@xy and cGVB_OPP@xy and cGVB_IN@x
z)) thf(cGVB_C$_4$, conjecture)

SEV359∧5.p TPS problem from GVB-MB-AXIOMS
g: $i thf($g$, type)
f: $i thf($f$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_ITERATE: $i → $i → $o thf(cGVB_ITERATE, type)
(cGVB_ITERATE@f@g) $\iff$ ∀xp: $i: ((cGVB_IN@$f$@xp and ∀xj: $i: ((cGVB_IN@xj@xp and cGVB_M@(cGVB_COMPOS
(cGVB_IN@(cGVB_COMPOSE@xj@f)@xp))) $\Rightarrow$ (cGVB_IN@g@xp)) thf(cGVB_AX_ITERATE$_2$, conjecture)

SEV360∧5.p TPS problem from GVB-MB-AXIOMS
z: $i thf($z$, type)
y: $i thf($y$, type)
f: $i thf($f$, type)
cGVB_SECOND: $i → $i thf(cGVB_SECOND, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
cGVB_OPP: $i → $o thf(cGVB_OPP, type)
cGVB_M: $i → $o thf(cGVB_M, type)

cGVB_APPLY: $i → $i → $i thf(cGVB_APPLY, type)
(cGVB_IN@z@(cGVB_APPLY@f@y)) ⟺ (cGVB_M@z and ∃xw: $i: (cGVB_M@xw and cGVB_OPP@xw and cGVB_IN@
y and cGVB_IN@z@(cGVB_SECOND@xw))) thf(cGVB_AX_APPLY, conjecture)

SEV361^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_SING_VAL: $i → $o thf(cGVB_SING_VAL, type)
(cGVB_SING_VAL@x) ⟺ ∀xu: $i, xv: $i, xw: $i: ((cGVB_M@xu and cGVB_M@xv and cGVB_M@xw) ⇒
((cGVB_IN@(cGVB_OP@xu@xv)@x and cGVB_IN@(cGVB_OP@xu@xw)@x) ⇒ xv = xw)) thf(cGVB_AX_SING_VAL,

SEV362^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
z: $i thf($z$, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_FLIP_RANGE: $i → $i thf(cGVB_FLIP_RANGE, type)
(cGVB_IN@z@(cGVB_FLIP_RANGE@x)) ⟺ (cGVB_M@z and ∃xu: $i, xv: $i, xw: $i: (cGVB_M@xu and cGVB_M@xv an
(cGVB_OP@xu@(cGVB_OP@xv@xw)) and cGVB_IN@(cGVB_OP@xu@(cGVB_OP@xw@xv))@x)) thf(cGVB_B$_8$, conjec

SEV363^5.p TPS problem from GVB-MB-AXIOMS
x: $i thf($x$, type)
z: $i thf($z$, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_ROT_RIGHT: $i → $i thf(cGVB_ROT_RIGHT, type)
(cGVB_IN@z@(cGVB_ROT_RIGHT@x)) ⟺ (cGVB_M@z and ∃xu: $i, xv: $i, xw: $i: (cGVB_M@xu and cGVB_M@xv and
(cGVB_OP@xu@(cGVB_OP@xv@xw)) and cGVB_IN@(cGVB_OP@xv@(cGVB_OP@xw@xu))@x)) thf(cGVB_B$_7$, conjec

SEV364^5.p TPS problem from GVB-MB-AXIOMS
g: $i thf($g$, type)
f: $i thf($f$, type)
z: $i thf($z$, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
(cGVB_IN@z@(cGVB_COMPOSE@g@f)) ⟺ (cGVB_M@z and ∃xx: $i, xy: $i, xw: $i: (cGVB_M@xx and cGVB_M@xy an
(cGVB_OP@xx@xy) and cGVB_IN@(cGVB_OP@xx@xw)@f and cGVB_IN@(cGVB_OP@xw@xy)@g)) thf(cGVB_AX_C

SEV365^5.p TPS problem from GVB-MB-AXIOMS
h: $i thf($h$, type)
f_2: $i thf($f_2$, type)
f_1: $i thf($f_1$, type)
s_1: $i thf($s_1$, type)
s_2: $i thf($s_2$, type)
cGVB_APPLY: $i → $i → $i thf(cGVB_APPLY, type)
cGVB_APP$_2$: $i → $i → $i → $i thf(cGVB_APP$_2$, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_MAPS: $i → $i → $i → $o thf(cGVB_MAPS, type)
cGVB_CLOSED: $i → $i → $o thf(cGVB_CLOSED, type)
cGVB_HOMOM: $i → $i → $i → $i → $i → $o thf(cGVB_HOMOM, type)
(cGVB_HOMOM@h@s_1@f_1@s_2@f_2) ⟺ (cGVB_CLOSED@s_1@f_1 and cGVB_CLOSED@s_2@f_2 and cGVB_MAPS@h@s_1
(cGVB_APPLY@h@(cGVB_APP$_2$@f_1@xx@xy)) = (cGVB_APP$_2$@f_2@(cGVB_APPLY@h@xx)@(cGVB_APPLY@h@xy))))

SEV366^5.p TPS problem from GVB-MB-THMS
b: $i thf($b$, type)
a: $i thf($a$, type)
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)

cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_M@(cGVB_OP@a@b) thf(cGVB_OP_PROP$_2$, conjecture)

SEV368^5.p TPS problem from GVB-MB-THMS
u: $i thf($u$, type)
cGVB_POWERSET: $i → $i thf(cGVB_POWERSET, type)
cGVB_M: $i → $o thf(cGVB_M, type)
(cGVB_M@u) ⇒ (cGVB_M@(cGVB_POWERSET@u)) thf(cGVB_C3A, conjecture)

SEV369^5.p TPS problem from GVB-MB-THMS
f: $i thf($f$, type)
x: $i thf($x$, type)
cGVB_IMAGE: $i → $i → $i thf(cGVB_IMAGE, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_FUNCTION: $i → $o thf(cGVB_FUNCTION, type)
(cGVB_M@x and cGVB_FUNCTION@f) ⇒ (cGVB_M@(cGVB_IMAGE@x@f)) thf(cGVB_C4A, conjecture)

SEV370^5.p TPS problem from GVB-MB-THMS
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
cGVB_M: $i → $o thf(cGVB_M, type)
∀xf: $i, xg: $i: ((cGVB_M@xf and cGVB_M@xg) ⇒ (cGVB_M@(cGVB_COMPOSE@xf@xg))) thf(cGVB_COMP_PROP

SEV371^5.p TPS problem from GVB-MB-THMS
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_SECOND: $i → $i thf(cGVB_SECOND, type)
cGVB_M: $i → $o thf(cGVB_M, type)
∀xa: $i, xb: $i: ((cGVB_M@xa and cGVB_M@xb) ⇒ (cGVB_SECOND@(cGVB_OP@xa@xb)) = xb) thf(cGVB_SND_PR

SEV372^5.p TPS problem from GVB-MB-THMS
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_FIRST: $i → $i thf(cGVB_FIRST, type)
cGVB_M: $i → $o thf(cGVB_M, type)
∀xa: $i, xb: $i: ((cGVB_M@xa and cGVB_M@xb) ⇒ (cGVB_FIRST@(cGVB_OP@xa@xb)) = xa) thf(cGVB_FST_PROP

SEV373^5.p TPS problem from GVB-MB-THMS
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
∀xf: $i, xg: $i, xh: $i: (cGVB_COMPOSE@xf@(cGVB_COMPOSE@xg@xh)) = (cGVB_COMPOSE@(cGVB_COMPOSE@xf@

SEV374^5.p TPS problem from GVB-MB-THMS
f: $i thf($f$, type)
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_M: $i → $o thf(cGVB_M, type)
∃p: $i: ∀xg: $i: ((cGVB_M@xg) ⇒ ((cGVB_IN@xg@p) ⟺ (cGVB_COMPOSE@f@xg) = (cGVB_COMPOSE@xg@f)))

SEV375^5.p TPS problem from GVB-MB-THMS
f: $i thf($f$, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
∃p: $i: ∀xg: $i: ((cGVB_IN@xg@$p$) ⟺ ((cGVB_COMPOSE@$f$@xg) = (cGVB_COMPOSE@xg@$f$) and cGVB_M@xg))

SEV376^5.p TPS problem from GVB-MB-THMS
f_3: $i thf($f_3$, type)
s_3: $i thf($s_3$, type)
f_1: $i thf($f_1$, type)
s_1: $i thf($s_1$, type)
h_1: $i thf($h_1$, type)
h_2: $i thf($h_2$, type)
f_2: $i thf($f_2$, type)
s_2: $i thf($s_2$, type)
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
cGVB_HOMOM: $i → $i → $i → $i → $i → $o thf(cGVB_HOMOM, type)
(cGVB_HOMOM@h_1@s_1@f_1@s_2@f_2 and cGVB_HOMOM@h_2@s_2@f_2@s_3@f_3) ⇒ (cGVB_HOMOM@(cGVB_COMPOSE@

SEV377^5.p TPS problem from GVB-MB-THMS
cGVB_COMPOSE: $i → $i → $i thf(cGVB_COMPOSE, type)
cGVB_APPLY: $i → $i → $i thf(cGVB_APPLY, type)
cGVB_DOMAIN: $i → $i thf(cGVB_DOMAIN, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_FUNCTION: $i → $o thf(cGVB_FUNCTION, type)
∀xf: $i, xg: $i, xx: $i: ((cGVB_FUNCTION@xf and cGVB_IN@xx@(cGVB_DOMAIN@xf)) ⇒ (cGVB_APPLY@xg@(cGVB_A
(cGVB_APPLY@(cGVB_COMPOSE@xg@xf)@xx)) thf(cGVB_APP_PROP$_1$, conjecture)

SEV378^5.p TPS problem from GVB-MB-THMS
cGVB_APPLY: $i → $i → $i thf(cGVB_APPLY, type)
cGVB_ITERATE: $i → $i → $o thf(cGVB_ITERATE, type)
∀xf: $i: (∃xg: $i: (cGVB_ITERATE@xf@xg and ∃xx: $i: ((cGVB_APPLY@xg@xx) = xx and ∀xz: $i: ((cGVB_APPLY@xg@xz
xz ⇒ xz = xx))) ⇒ ∃xy: $i: (cGVB_APPLY@xf@xy) = xy) thf(cGVB_THM15B, conjecture)

SEV379^5.p TPS problem from GVB-MB-THMS
cGVB_OP: $i → $i → $i thf(cGVB_OP, type)
cGVB_M: $i → $o thf(cGVB_M, type)
∀xa: $i, xb: $i, xc: $i, xd: $i: ((cGVB_M@xa and cGVB_M@xb and cGVB_M@xc and cGVB_M@xd and (cGVB_OP@xa@xb)
(cGVB_OP@xc@xd)) ⇒ (xa = xc and xb = xd)) thf(cGVB_OP_PROP$_1$, conjecture)

SEV380^5.p TPS problem from GVB-MB-THMS
cGVB_APPLY: $i → $i → $i thf(cGVB_APPLY, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_ITERATE: $i → $i → $o thf(cGVB_ITERATE, type)
cGVB_FUNCTION: $i → $o thf(cGVB_FUNCTION, type)
∀xf: $i: ((cGVB_FUNCTION@xf and ∃xg: $i: (cGVB_FUNCTION@xg and cGVB_ITERATE@xf@xg and ∃xx: $i: (cGVB_M
xx and ∀xz: $i: ((cGVB_M@xz and (cGVB_APPLY@xg@xz) = xz) ⇒ xz = xx)))) ⇒ ∃xy: $i: (cGVB_M@xy and (cGVB_A
xy)) thf(cGVB_THM15B$_1$, conjecture)

SEV381^5.p TPS problem from GVB-MB-THMS
cGVB_APPLY: $i → $i → $i thf(cGVB_APPLY, type)
cGVB_DOMAIN: $i → $i thf(cGVB_DOMAIN, type)
cGVB_IN: $i → $i → $o thf(cGVB_IN, type)
cGVB_FUNCTION: $i → $o thf(cGVB_FUNCTION, type)
cGVB_M: $i → $o thf(cGVB_M, type)
cGVB_ITERATE: $i → $i → $o thf(cGVB_ITERATE, type)
∀xf: $i: ((cGVB_M@xf and cGVB_FUNCTION@xf and ∃xg: $i: (cGVB_ITERATE@xf@xg and cGVB_M@xg and cGVB_FU
xx and ∀xz: $i: ((cGVB_APPLY@xg@xz) = xz ⇒ xz = xx)))) ⇒ ∃xy: $i: (cGVB_APPLY@xf@xy) = xy) thf(cGVB_TH

SEV382^5.p TPS problem TRANS-IND
Transfinite induction theorem, from [BB93].
a: $tType thf(a_type, type)
∀xr: $a → a → o, p: $a → $o: ((∀xs: $a → $o: (∃xz: $a: (xs@xz) ⇒ ∃xy: $a: (xs@xy and ∀xw: $a: ((xr@xw@xy) ⇒
¬ xs@xw))) and ∀xx: $a: (∀xy: $a: ((xr@xy@xx) ⇒ ($p$@xy)) ⇒ ($p$@xx))) ⇒ ∀xx: $a: ($p$@xx)) thf(cTRANS_IND, conjectur

SEV383^5.p TPS problem BLEDSOE-FENG-7
There is some set that doesn't contain a given object a - so the empty set works.
a: $i thf($a$, type)
∃a: $i → $o: ¬ a@a thf(cBLEDSOE_FENG$_7$, conjecture)

SEV384^5.p TPS problem THM117B
If R is a well-founded relation and P is an inductive property over R restricted to s, then everything in s has property
P; here R y w means y > w.
cP: $i → $o thf(cP, type)
s: $i → $o thf($s$, type)
cR: $i → $i → $o thf(cR, type)
(∀xx: $i → $o, xz: $i: ((xx@xz) ⇒ ∃xy: $i: (xx@xy and ∀xw: $i: ((cR@xy@xw) ⇒ ¬ xx@xw))) and ∀xx$_1$: $i: (∀xy$_1$: $i: ((s@x
(cP@xy$_1$)) ⇒ (cP@xx$_1$))) ⇒ ∀xx$_2$: $i: (($s$@xx$_2$) ⇒ (cP@xx$_2$)) thf(cTHM117B, conjecture)

SEV385^5.p TPS problem X6004
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
x: b thf(x, type)

y: a thf(y, type)
$\exists$xs: $b \to a$: ($\forall$xx$_6$: b: (x = xx$_6$ $\Rightarrow$ y = (xs@xx$_6$)) and $\forall$xy$_{56}$: a: (y = xy$_{56}$ $\Rightarrow$ $\exists$xy$_0$: b: (λxx$_7$: b: (x = xx$_7$ and xy$_{56}$ = (xs@xx$_7$))) = (λxx: b, xy: b: xx = xy@xy$_0$))) thf(cX6004_pme, conjecture)

SEV386^5.p TPS problem TTTP5306A
a: $tType thf(a_type, type)
p: $a \to$ $o thf($p$, type)
$\exists$xy: a: p = (λxx: a, xy: a: xx = xy@xy) $\iff$ $\exists$xy: a: (p@xy and $\forall$xz: a: ((p@xz) $\Rightarrow$ xy = xz)) thf(cTTTP5306A_pme, co

SEV387^5.p TPS problem GAZING-THM44
a: $tType thf(a_type, type)
$\forall s$: $a \to$ $o, t: $a \to$ $o, u: $a \to$ $o: ($\lambda$xx: a: (s@xx and ((t@xx and $\neg$ u@xx) or (u@xx and $\neg$ t@xx)))) = (λxz: a: ((s@xz and t@

SEV388^5.p TPS problem THM36
cS: $i $\to$ $o thf(cS, type)
cR: $i $\to$ $o thf(cR, type)
cR = cS $\Rightarrow$ $\forall$xx: $i: ((cR@xx) $\Rightarrow$ (cS@xx)) thf(cTHM36_pme, conjecture)

SEV389^5.p TPS problem THM37
cS: $i $\to$ $o thf(cS, type)
cR: $i $\to$ $o thf(cR, type)
cR = (λxx: $i: (cR@xx and cS@xx)) $\Rightarrow$ $\forall$xx: $i: ((cR@xx) $\Rightarrow$ (cS@xx)) thf(cTHM37_pme, conjecture)

SEV390^5.p TPS problem THM35
cS: $i $\to$ $o thf(cS, type)
cR: $i $\to$ $o thf(cR, type)
(λxx: $i: (cR@xx and cS@xx)) = cR $\Rightarrow$ $\forall$xx: $i: ((cR@xx) $\Rightarrow$ (cS@xx)) thf(cTHM35_pme, conjecture)

SEV391^5.p TPS problem THM87
cP: $i $\to$ $i $\to$ $i $\to$ $o thf(cP, type)
k: $i $\to$ $i thf($k$, type)
h: $i $\to$ $i thf($h$, type)
a: $i thf($a$, type)
$\exists$xv: $i: $\forall$xj: $i: $\exists$xq: $i: ((cP@$a$@($h$@xj)@xj or cP@xv@($k$@xj)@xj) $\Rightarrow$ (cP@xv@xq@xj)) thf(cTHM87_pme, conjecture)

SEV392^5.p TPS problem THM38
cS: $i $\to$ $o thf(cS, type)
cR: $i $\to$ $o thf(cR, type)
(λxx: $i: (cR@xx and cS@xx)) = (λxz: $i: (cR@xz or cS@xz)) $\Rightarrow$ $\forall$xx: $i: ((cR@xx) $\Rightarrow$ (cS@xx)) thf(cTHM38_pme, conj

SEV393^5.p TPS problem THM39
cS: $i $\to$ $o thf(cS, type)
cR: $i $\to$ $o thf(cR, type)
(λxz: $i: (cR@xz or cS@xz)) = ($\lambda$xx: $i: (cR@xx and cS@xx)) $\Rightarrow$ $\forall$xx: $i: ((cR@xx) $\Rightarrow$ (cS@xx)) thf(cTHM39_pme, conj

SEV394^5.p TPS problem THM269
Example for CADE-15.
a: $tType thf(a_type, type)
$\forall$xw: $a \to$ $o, xy: $a \to$ $o, xz: $a \to$ $o: (($\forall$xx: a: ((xw@xx and $\neg$ xz@xx) $\Rightarrow$ (xy@xx)) and (λxx: a: (xz@xx and $\neg$ xy@xx)) = (λxx: a: $false)) $\Rightarrow$ $\forall$xx: a: ((xw@xx) $\Rightarrow$ (xy@xx))) thf(cTHM269_pme, conjecture)

SEV396^5.p TPS problem THM31
cR: $i $\to$ $o thf(cR, type)
cS: $i $\to$ $o thf(cS, type)
$\forall$xx: $i: ((cR@xx) $\Rightarrow$ (cS@xx)) $\iff$ (λxx: $i: (cR@xx and cS@xx)) = cR thf(cTHM31_pme, conjecture)

SEV397^5.p TPS problem THM59
a: $tType thf(a_type, type)
cZ: $a \to$ $o thf(cZ, type)
cY: $a \to$ $o thf(cY, type)
cX: $a \to$ $o thf(cX, type)
$\forall$xx: a: (((cX@xx and cY@xx) or cZ@xx) $\iff$ ((cX@xx or cZ@xx) and (cY@xx or cZ@xx))) thf(cTHM59_pme, conjectu

SEV398^5.p TPS problem THM67A
a: $tType thf(a_type, type)
cF: ($a \to$ $o) $\to$ $a \to$ $o thf(cF, type)
cG: ($a \to$ $o) $\to$ $a \to$ $o thf(cG, type)

$(\forall s\colon a \to \$o, t\colon a \to \$o\colon (\forall xx\colon a\colon ((s@xx) \Rightarrow (t@xx)) \Rightarrow \forall xx\colon a\colon ((cF@t@xx) \Rightarrow (cF@s@xx)))$ and $\forall s\colon a \to \$o\colon (\forall xx\colon a\colon ((s@xx) \Rightarrow (cF@(cG@s)@xx))$ and $\forall xx\colon a\colon ((s@xx) \Rightarrow (cG@(cF@s)@xx)))) \Rightarrow \forall s\colon a \to \$o, xx\colon a\colon ((cF@(cG@(cF@s))@xx) \iff (cF@s@xx))$ thf(cTHM67A_pme, conjecture)

SEV399^5.p TPS problem THM597
If K and L are order reversing, K o L has a fixed point.
$\forall k\colon (\$i \to \$o) \to \$i \to \$o, l\colon (\$i \to \$o) \to \$i \to \$o\colon ((\forall xu\colon \$i \to \$o, xv\colon \$i \to \$o\colon (\forall xx\colon \$i\colon ((xu@xx) \Rightarrow (xv@xx)) \Rightarrow \forall xx\colon \$i\colon ((k@xv@xx) \Rightarrow (k@xu@xx)))$ and $\forall xu\colon \$i \to \$o, xv\colon \$i \to \$o\colon (\forall xx\colon \$i\colon ((xu@xx) \Rightarrow (xv@xx)) \Rightarrow \forall xx\colon \$i\colon ((l@xv@xx) \Rightarrow (l@xu@xx)))) \Rightarrow \exists xw\colon \$i \to \$o\colon (k@(l@xw)) = xw)$ thf(cTHM597_pme, conjecture)

SEV400^5.p TPS problem THM590
A simple theorem about existence of intersection.
cQ: $i → $o thf(cQ, type)
cP: $i → $o thf(cP, type)
$\exists s\colon \$i \to \$o\colon (\forall xx\colon \$i\colon ((s@xx) \Rightarrow (cP@xx))$ and $\forall xx\colon \$i\colon ((s@xx) \Rightarrow (cQ@xx))$ and $\forall r\colon \$i \to \$o\colon ((\forall xx\colon \$i\colon ((r@xx) \Rightarrow (cP@xx))$ and $\forall xx\colon \$i\colon ((r@xx) \Rightarrow (cQ@xx))) \Rightarrow \forall xx\colon \$i\colon ((r@xx) \Rightarrow (s@xx))))$ thf(cTHM590_pme, conjecture)

SEV401^5.p TPS problem THM67
a: $tType thf(a_type, type)
cF: $(a \to \$o) \to a \to \$o$ thf(cF, type)
cG: $(a \to \$o) \to a \to \$o$ thf(cG, type)
$(\forall s\colon a \to \$o, t\colon a \to \$o\colon (\forall xx\colon a\colon ((s@xx) \Rightarrow (t@xx)) \Rightarrow \forall xx\colon a\colon ((cF@t@xx) \Rightarrow (cF@s@xx)))$ and $\forall s\colon a \to \$o, xx\colon a\colon ((s@xx) \Rightarrow (cF@(cG@s)@xx))$ and $\forall s\colon a \to \$o, xx\colon a\colon ((s@xx) \Rightarrow (cG@(cF@s)@xx))) \Rightarrow \forall s\colon a \to \$o, xx\colon a\colon ((cF@(cG@(cF@s))@xx) \iff (cF@s@xx))$ thf(cTHM67_pme, conjecture)

SEV402^5.p TPS problem THM596
If a set function K is order reversing, then K o K has a fixed point. This is a special case of Knaster-Tarski.
$\forall k\colon (\$i \to \$o) \to \$i \to \$o\colon (\forall xu\colon \$i \to \$o, xv\colon \$i \to \$o\colon (\forall xx\colon \$i\colon ((xu@xx) \Rightarrow (xv@xx)) \Rightarrow \forall xx\colon \$i\colon ((k@xv@xx) \Rightarrow (k@xu@xx))) \Rightarrow \exists xw\colon \$i \to \$o\colon (k@(k@xw)) = xw)$ thf(cTHM596_pme, conjecture)

SEV403^5.p TPS problem THM598
$\forall k\colon (\$i \to \$o) \to \$i \to \$o, l\colon (\$i \to \$o) \to \$i \to \$o\colon ((\forall xu\colon \$i \to \$o, xv\colon \$i \to \$o\colon (\forall xx\colon \$i\colon ((xu@xx) \Rightarrow (xv@xx)) \Rightarrow \forall xx\colon \$i\colon ((k@xu@xx) \Rightarrow (k@xv@xx)))$ and $\forall xu\colon \$i \to \$o, xv\colon \$i \to \$o\colon (\forall xx\colon \$i\colon ((xu@xx) \Rightarrow (xv@xx)) \Rightarrow \forall xx\colon \$i\colon ((l@xu@xx) \Rightarrow (l@xv@xx)))) \Rightarrow \exists xw\colon \$i \to \$o\colon (\lambda xz\colon \$i\colon (k@xw@xz$ or $l@xw@xz)) = xw)$ thf(cTHM598_pme, conjecture)

SEV404^5.p TPS problem THM595
Existence of a stream of P values.
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
cRST: $b \to b$ thf(cRST, type)
cFST: $b \to a$ thf(cFST, type)
cP: $a \to \$o$ thf(cP, type)
$\exists xv\colon b \to \$o\colon (\forall xx\colon b\colon ((xv@xx) \Rightarrow (cP@(cFST@xx)))$ and $\forall xx\colon b\colon ((xv@xx) \Rightarrow (xv@(cRST@xx)))$ and $\forall xu\colon b \to \$o\colon ((\forall xx\colon b\colon ((xu@xx) \Rightarrow (cP@(cFST@xx)))$ and $\forall xx\colon b\colon ((xu@xx) \Rightarrow (xu@(cRST@xx)))) \Rightarrow \forall xx\colon b\colon ((xu@xx) \Rightarrow (xv@xx))))$ thf(cTHM595_pme, conjecture)

SEV405^5.p TPS problem from SETS-THMS
cA: $o thf(cA, type)
$\exists u\colon \$i \to \$o\colon \forall v\colon \$i\colon ((u@v) \iff cA)$ thf(cCOMP$_1$, conjecture)

SEV406^5.p TPS problem from SETS-THMS
cA: $i → $o thf(cA, type)
cB: $i → $o thf(cB, type)
cP: $(\$i \to \$o) \to \$o$ thf(cP, type)
$(cP@\lambda xz\colon \$i\colon (cA@xz$ or $cB@xz)) \Rightarrow (cP@\lambda xz\colon \$i\colon (cB@xz$ or $cA@xz))$ thf(cTRIVEXT2_pme, conjecture)

SEV408^5.p TPS problem from SETS-THMS
cF: $(\$i \to \$o) \to \$o$ thf(cF, type)
$\exists g\colon (\$i \to \$o) \to \$o\colon \forall a\colon \$i \to \$o\colon ((g@a) \Rightarrow \exists b\colon \$i \to \$o\colon (cF@b$ and $\forall xx\colon \$i\colon ((a@xx) \Rightarrow (b@xx))))$ thf(cBLEDSOE2_pme

SEV409^5.p TPS problem from SETS-THMS
$\exists r\colon (\$i \to \$o) \to (\$i \to \$o) \to \$o\colon \forall x\colon \$i \to \$o, y\colon \$i \to \$o\colon ((r@x@y$ and $r@y@x) \Rightarrow \forall xx\colon \$i\colon ((x@xx) \iff (y@xx)))$ thf(cTHM120_BUG_pme, conjecture)

SEV410^5.p TPS problem from SETS-THMS

cA: $i → $o thf(cA, type)
cP: ($i → $o) → $o thf(cP, type)
cB: $i → $o thf(cB, type)
(cP@λxx: $i: (cA@xx or cB@xx)) ⇒ ∃xu: $i → $o: (cP@xu and ∀xx: $i: ((cA@xx) ⇒ (xu@xx))) thf(cSV1_pme, conjectu

SEV411^5.p TPS problem from SETS-THMS
cB: $i → $o thf(cB, type)
cA: $i → $o thf(cA, type)
(∀xx: $i: ((cA@xx) ⇒ (cB@xx)) or ∀xx: $i: ((cA@xx) ⇒ (cB@xx))) ⇒ ∀xx: $i: ((cA@xx) ⇒ (cB@xx)) thf(cDUAL_EC

SEV412^5.p TPS problem from SETS-THMS
cG: $o thf(cG, type)
cB: $i → $o thf(cB, type)
cA: $i → $o thf(cA, type)
((∀xx: $i: ((cA@xx) ⇒ (cB@xx)) ⇒ cG) or (∀xx: $i: ((cA@xx) ⇒ (cB@xx)) ⇒ cG)) ⇒ (∀xx: $i: ((cA@xx) ⇒ (cB@xx)) ⇒ cG) thf(cDUAL_EG2_pme, conjecture)

SEV413^5.p TPS problem from SETS-THMS
cB: $i → $o thf(cB, type)
cA: $i → $o thf(cA, type)
(∀xx: $i: ((cA@xx) ⇒ (cB@xx)) or ∀xx: $i: ((cA@xx) ⇒ (cB@xx))) ⇒ (∀xx: $i: ((cA@xx) ⇒ (cB@xx)) and ∀xx: $i: ((cA@
(cB@xx))) thf(cDUAL_EG5_pme, conjecture)

SEV414^5.p TPS problem from SETS-THMS
cS: $i → $i thf(cS, type)
c_0: $i thf($c_0$, type)
∃xv: $i → $o: (xv@$c_0$ and ∀xw: $i: ((xv@xw) ⇒ (xv@(cS@xw))) and ∀xp: $i → $o: ((xp@$c_0$ and ∀xw: $i: ((xp@xw) ⇒
(xp@(cS@xw)))) ⇒ ∀xx: $i: ((xv@xx) ⇒ (xp@xx)))) thf(cTHM594_pme, conjecture)

SEV416^5.p TPS problem from SETS-THMS
cG: $o thf(cG, type)
cB: $i → $o thf(cB, type)
cA: $i → $o thf(cA, type)
(((∀xx: $i: ((cA@xx) ⇒ (cB@xx)) and ∀xx: $i: ((cA@xx) ⇒ (cB@xx))) ⇒ cG) or (∀xx: $i: ((cA@xx) ⇒
(cB@xx)) ⇒ cG)) ⇒ (∀xx: $i: ((cA@xx) ⇒ (cB@xx)) ⇒ cG) thf(cDUAL_EG3_pme, conjecture)

SEV417^5.p TPS problem from SETS-THMS
a: $tType thf(a_type, type)
cP: (a → $o) → $o thf(cP, type)
∀x: a → $o, y: a → $o, z: a → $o: ((∀xx: a: ((x@xx) ⇒ (y@xx)) and ∀xx: a: ((x@xx) ⇒ (z@xx)) and (λxx: a: (y@xx and z@
(λxx: a: $false) and cP@λxx: a: (y@xx and z@xx)) ⇒ (x = (λxx: a: $false) and cP@λxx: a: $false)) thf(cTHM502_pme,

SEV418^5.p TPS problem from SETS-THMS
b: $tType thf(b_type, type)
a: $tType thf(a_type, type)
cG: (b → $o) → a → $o thf(cG, type)
cF: (a → $o) → b → $o thf(cF, type)
(∀xy: b, y: b → $o: ((cF@(cG@$y$)@xy) ⟺ ($y$@xy)) and ∀xx: a, x: a → $o: ((cG@(cF@$x$)@xx) ⟺ ($x$@xx)) and ∀$u$: a →
$o, v: a → $o: (∀xx: a: ((u@xx) ⇒ (v@xx)) ⇒ ∀xx: b: ((cF@u@xx) ⇒ (cF@v@xx)))) ⇒ ∀m: b → $o, n: b →
$o: (∀xx: b: ((m@xx) ⇒ (n@xx)) ⇒ ∀xx: a: ((cG@m@xx) ⇒ (cG@n@xx))) thf(cTHM592_pme, conjecture)

SEV419^5.p TPS problem from SETS-THMS
a: $tType thf(a_type, type)
b: $tType thf(b_type, type)
∀f: (a → $o) → b → $o: ((∀$x$: a → $o, y: a → $o: (∀xx: a: ((x@xx) ⇒ (y@xx)) ⇒ ∀xx: b: ((f@x@xx) ⇒
(f@y@xx))) and ∀x: a → $o, y: a → $o: (($f$@$x$) = ($f$@$y$) ⇒ x = y) and ∀z: b → $o: ∃$y$: a → $o: ($f$@$y$) = z) ⇒
∀x: a → $o, y: a → $o: (∀xx: b: ((f@x@xx) ⇒ (f@y@xx)) ⇒ ∀xx: a: ((x@xx) ⇒ (y@xx)))) thf(cTHM593_pme, conjectu

SEV420^1.p Size of disjoint sets' union
If —A—=—A'— & —B—=—B'— & —A' ∧ B'—=0, then —A U B— =< —A' U B'—
include('Axioms/SET008^0.ax')
is_function: ($i → $o) → ($i → $i) → ($i → $o) → $o thf(is_function_type, type)
is_function = (λx: $i → $o, f: $i → $i, y: $i → $o: ∀$e$: $i: (($x$@$e$) ⇒ ($y$@($f$@$e$)))) thf(is_function, definition)
injection: ($i → $o) → ($i → $i) → ($i → $o) → $o thf(injection_type, type)

injection = (λx: \$i → \$o, f: \$i → \$i, y: \$i → \$o: ((is_function@x@f@y) ⇒ ∀e_1: \$i, e_2: \$i: ((x@e_1 and x@e_2 and (f@e_1) = (f@e_2)) ⇒ $e_1 = e_2$))) thf(injection, definition)
surjection: (\$i → \$o) → (\$i → \$i) → (\$i → \$o) → \$o thf(surjection_type, type)
surjection = (λx: \$i → \$o, f: \$i → \$i, y: \$i → \$o: ((is_function@x@f@y) ⇒ ∀e_1: \$i: ((y@e_1) ⇒ ∃e_2: \$i: (x@e_2 and (f@e_2) = e_1)))) thf(surjection, definition)
bijection: (\$i → \$o) → (\$i → \$i) → (\$i → \$o) → \$o thf(bijection_type, type)
bijection = (λx: \$i → \$o, f: \$i → \$i, y: \$i → \$o: (injection@x@f@y and surjection@x@f@y)) thf(bijection, definition)
equinumerous: (\$i → \$o) → (\$i → \$o) → \$o thf(equinumerous_type, type)
equinumerous = (λx: \$i → \$o, y: \$i → \$o: ∃f: \$i → \$i: (bijection@x@f@y)) thf(equinumerous, definition)
embedding: (\$i → \$o) → (\$i → \$o) → \$o thf(embedding_type, type)
embedding = (λx: \$i → \$o, y: \$i → \$o: ∃f: \$i → \$i: (injection@x@f@y)) thf(embedding, definition)
∀a: \$i → \$o, ap: \$i → \$o, b: \$i → \$o, bp: \$i → \$o: ((equinumerous@a@ap and equinumerous@b@bp and (intersection@ap@bp) emptyset) ⇒ (embedding@(union@a@b)@(union@ap@bp))) thf(prove, conjecture)

SEV421=1.p Correctness of an efficient emptiness check
Using invariant on size to prove correctness of an efficient emptiness check.
set: \$tType tff(set_type, type)
element: \$tType tff(element_type, type)
empty_set: set tff(empty_set_type, type)
singleton: element → set tff(singleton_type, type)
∈ : (element × set) → \$o tff(member_type, type)
⊆ : (set × set) → \$o tff(subset_type, type)
intersection: (set × set) → set tff(intersection_type, type)
union: (set × set) → set tff(union_type, type)
\: (set × set) → set tff(difference_type, type)
complement: set → set tff(complement_type, type)
cardinality: set → \$int tff(cardinality_type, type)
∀s: set: (∀x: element: ¬ $x \in s$ ⟺ s = empty_set) tff(empty_set, axiom)
∀x: element, a: element: ($x \in$ singleton(a) ⟺ $x = a$) tff(singleton, axiom)
∀a: set, b: set: ($a \subseteq b$ ⟺ ∀x: element: ($x \in a$ ⇒ $x \in b$)) tff(subset, axiom)
∀x: element, a: set, b: set: ($x \in$ intersection(a, b) ⟺ ($x \in a$ and $x \in b$)) tff(intersection, axiom)
∀x: element, a: set, b: set: ($x \in$ union(a, b) ⟺ ($x \in a$ or $x \in b$)) tff(union, axiom)
∀b: element, a: set, e: set: ($b \in (e \setminus a)$ ⟺ ($b \in e$ and ¬ $b \in a$)) tff(difference, axiom)
∀x: element, s: set: ($x \in s$ ⟺ ¬ $x \in s'$) tff(complement, axiom)
∀s: set: (cardinality(s) = 0 ⟺ s = empty_set) tff(cardinality_empty_set, axiom)
∀x: element, s: set: (intersection(singleton(x), s) = singleton(x) ⟺ cardinality(union(singleton(x), s)) = cardinality(s))
∀x: element, s: set: (intersection(singleton(x), s) = empty_set ⟺ cardinality(union(singleton(x), s)) = \$sum(cardinality(s),
∀s: set, t: set: (cardinality(intersection(s, t)) = 0 ⟺ intersection(s, t) = empty_set) tff(cardinality_intersection$_3$, axiom)
∀a: set, b: set: (intersection(a, b) = empty_set ⟺ cardinality(union(a, b)) = \$sum(cardinality(a), cardinality(b))) tff(car
∀x: element, c: set, size: \$int: (($\neg x \in c$ and size = cardinality(c)) ⇒ (size = 0 ⟺ c = empty_set)) tff(vc$_1$, conjecture)

SEV422=1.p Maintaining correct size when inserting fresh element
set: \$tType tff(set_type, type)
element: \$tType tff(element_type, type)
empty_set: set tff(empty_set_type, type)
singleton: element → set tff(singleton_type, type)
∈ : (element × set) → \$o tff(member_type, type)
⊆ : (set × set) → \$o tff(subset_type, type)
intersection: (set × set) → set tff(intersection_type, type)
union: (set × set) → set tff(union_type, type)
\: (set × set) → set tff(difference_type, type)
complement: set → set tff(complement_type, type)
cardinality: set → \$int tff(cardinality_type, type)
∀s: set: (∀x: element: ¬ $x \in s$ ⟺ s = empty_set) tff(empty_set, axiom)
∀x: element, a: element: ($x \in$ singleton(a) ⟺ $x = a$) tff(singleton, axiom)
∀a: set, b: set: ($a \subseteq b$ ⟺ ∀x: element: ($x \in a$ ⇒ $x \in b$)) tff(subset, axiom)
∀x: element, a: set, b: set: ($x \in$ intersection(a, b) ⟺ ($x \in a$ and $x \in b$)) tff(intersection, axiom)
∀x: element, a: set, b: set: ($x \in$ union(a, b) ⟺ ($x \in a$ or $x \in b$)) tff(union, axiom)
∀b: element, a: set, e: set: ($b \in (e \setminus a)$ ⟺ ($b \in e$ and ¬ $b \in a$)) tff(difference, axiom)
∀x: element, s: set: ($x \in s$ ⟺ ¬ $x \in s'$) tff(complement, axiom)

$\forall s$: set: (cardinality$(s) = 0 \iff s =$ empty_set) tff(cardinality_empty_set, axiom)
$\forall x$: element, s: set: (intersection(singleton$(x), s) =$ singleton$(x) \iff$ cardinality(union(singleton$(x), s)) =$ cardinality(s))
$\forall x$: element, s: set: (intersection(singleton$(x), s) =$ empty_set $\iff$ cardinality(union(singleton$(x), s)) =$ $sum(cardinality$(s)$,
$\forall s$: set, t: set: (cardinality(intersection$(s, t)) = 0 \iff$ intersection$(s, t) =$ empty_set) tff(cardinality_intersection$_3$, axiom)
$\forall a$: set, b: set: (intersection$(a, b) =$ empty_set $\iff$ cardinality(union$(a, b)) =$ $sum(cardinality$(a)$, cardinality$(b)))$ tff(car
$\forall x$: element, c: set, size: $int: ($(¬ $x \in c$ and size = cardinality$(c)) \Rightarrow$ $sum(size, 1) =$ cardinality(union(singleton$(x), c)))$ t

SEV423=1.p Maintaining size after inserting any element
set: $tType tff(set_type, type)
element: $tType tff(element_type, type)
empty_set: set tff(empty_set_type, type)
singleton: element → set tff(singleton_type, type)
$\in$: (element × set) → $o tff(member_type, type)
$\subseteq$: (set × set) → $o tff(subset_type, type)
intersection: (set × set) → set tff(intersection_type, type)
union: (set × set) → set tff(union_type, type)
\: (set × set) → set tff(difference_type, type)
complement: set → set tff(complement_type, type)
cardinality: set → $int tff(cardinality_type, type)
$\forall s$: set: ($\forall x$: element: ¬ $x \in s \iff s =$ empty_set) tff(empty_set, axiom)
$\forall x$: element, a: element: ($x \in$ singleton$(a) \iff x = a$) tff(singleton, axiom)
$\forall a$: set, b: set: ($a \subseteq b \iff \forall x$: element: ($x \in a \Rightarrow x \in b$)) tff(subset, axiom)
$\forall x$: element, a: set, b: set: ($x \in$ intersection$(a, b) \iff (x \in a$ and $x \in b)$) tff(intersection, axiom)
$\forall x$: element, a: set, b: set: ($x \in$ union$(a, b) \iff (x \in a$ or $x \in b)$) tff(union, axiom)
$\forall b$: element, a: set, e: set: ($b \in (e \setminus a) \iff (b \in e$ and ¬ $b \in a)$) tff(difference, axiom)
$\forall x$: element, s: set: ($x \in s \iff$ ¬ $x \in s'$) tff(complement, axiom)
$\forall s$: set: (cardinality$(s) = 0 \iff s =$ empty_set) tff(cardinality_empty_set, axiom)
$\forall x$: element, s: set: (intersection(singleton$(x), s) =$ singleton$(x) \iff$ cardinality(union(singleton$(x), s)) =$ cardinality(s))
$\forall x$: element, s: set: (intersection(singleton$(x), s) =$ empty_set $\iff$ cardinality(union(singleton$(x), s)) =$ $sum(cardinality$(s)$,
$\forall s$: set, t: set: (cardinality(intersection$(s, t)) = 0 \iff$ intersection$(s, t) =$ empty_set) tff(cardinality_intersection$_3$, axiom)
$\forall a$: set, b: set: (intersection$(a, b) =$ empty_set $\iff$ cardinality(union$(a, b)) =$ $sum(cardinality$(a)$, cardinality$(b)))$ tff(car
$\forall x$: element, c: set, size: $int, size$_1$: $int: ((size = cardinality(c) and size$_1$ = cardinality(union(singleton$(x), c))) \Rightarrow$
$lesseq(size$_1$, $sum(size, 1))) tff(vc$_3$, conjecture)

SEV424=1.p Allocating and inserting three objects
Allocating and inserting three objects into a container data structure.
set: $tType tff(set_type, type)
element: $tType tff(element_type, type)
empty_set: set tff(empty_set_type, type)
singleton: element → set tff(singleton_type, type)
$\in$: (element × set) → $o tff(member_type, type)
$\subseteq$: (set × set) → $o tff(subset_type, type)
intersection: (set × set) → set tff(intersection_type, type)
union: (set × set) → set tff(union_type, type)
\: (set × set) → set tff(difference_type, type)
complement: set → set tff(complement_type, type)
cardinality: set → $int tff(cardinality_type, type)
$\forall s$: set: ($\forall x$: element: ¬ $x \in s \iff s =$ empty_set) tff(empty_set, axiom)
$\forall x$: element, a: element: ($x \in$ singleton$(a) \iff x = a$) tff(singleton, axiom)
$\forall a$: set, b: set: ($a \subseteq b \iff \forall x$: element: ($x \in a \Rightarrow x \in b$)) tff(subset, axiom)
$\forall x$: element, a: set, b: set: ($x \in$ intersection$(a, b) \iff (x \in a$ and $x \in b)$) tff(intersection, axiom)
$\forall x$: element, a: set, b: set: ($x \in$ union$(a, b) \iff (x \in a$ or $x \in b)$) tff(union, axiom)
$\forall b$: element, a: set, e: set: ($b \in (e \setminus a) \iff (b \in e$ and ¬ $b \in a)$) tff(difference, axiom)
$\forall x$: element, s: set: ($x \in s \iff$ ¬ $x \in s'$) tff(complement, axiom)
$\forall s$: set: (cardinality$(s) = 0 \iff s =$ empty_set) tff(cardinality_empty_set, axiom)
$\forall x$: element, s: set: (intersection(singleton$(x), s) =$ singleton$(x) \iff$ cardinality(union(singleton$(x), s)) =$ cardinality(s))
$\forall x$: element, s: set: (intersection(singleton$(x), s) =$ empty_set $\iff$ cardinality(union(singleton$(x), s)) =$ $sum(cardinality$(s)$,
$\forall s$: set, t: set: (cardinality(intersection$(s, t)) = 0 \iff$ intersection$(s, t) =$ empty_set) tff(cardinality_intersection$_3$, axiom)
$\forall a$: set, b: set: (intersection$(a, b) =$ empty_set $\iff$ cardinality(union$(a, b)) =$ $sum(cardinality$(a)$, cardinality$(b)))$ tff(car

$\forall c$: set, a: set, x_1: element, x_2: element, x_3: element: (($c \subseteq a$ and $\neg\, x_1 \in a$ and $\neg\, x_2 \in \text{union}(a, \text{singleton}(x_1))$ and $\neg\, x_3 \in$ $\text{union}(\text{union}(a, \text{singleton}(x_1)), \text{singleton}(x_2))) \Rightarrow \text{cardinality}(\text{union}(\text{union}(\text{union}(c, \text{singleton}(x_1)), \text{singleton}(x_2)), \text{singleton}(x_3$ $\text{sum}(\text{cardinality}(c), 3))$ tff(vc_4, conjecture)

SEV425=1.p Allocating and inserting at least three objects
Allocating and inserting at least three objects into a container data structure.
set: $tType tff(set_type, type)
element: $tType tff(element_type, type)
empty_set: set tff(empty_set_type, type)
singleton: element → set tff(singleton_type, type)
$\in$: (element × set) → $o tff(member_type, type)
$\subseteq$: (set × set) → $o tff(subset_type, type)
intersection: (set × set) → set tff(intersection_type, type)
union: (set × set) → set tff(union_type, type)
\: (set × set) → set tff(difference_type, type)
complement: set → set tff(complement_type, type)
cardinality: set → $int tff(cardinality_type, type)
$\forall s$: set: ($\forall x$: element: $\neg\, x \in s \iff s = \text{empty\_set}$) tff(empty_set, axiom)
$\forall x$: element, a: element: ($x \in \text{singleton}(a) \iff x = a$) tff(singleton, axiom)
$\forall a$: set, b: set: ($a \subseteq b \iff \forall x$: element: ($x \in a \Rightarrow x \in b$)) tff(subset, axiom)
$\forall x$: element, a: set, b: set: ($x \in \text{intersection}(a, b) \iff (x \in a$ and $x \in b)$) tff(intersection, axiom)
$\forall x$: element, a: set, b: set: ($x \in \text{union}(a, b) \iff (x \in a$ or $x \in b)$) tff(union, axiom)
$\forall b$: element, a: set, e: set: ($b \in (e \setminus a) \iff (b \in e$ and $\neg\, b \in a)$) tff(difference, axiom)
$\forall x$: element, s: set: ($x \in s \iff \neg\, x \in s'$) tff(complement, axiom)
$\forall s$: set: ($\text{cardinality}(s) = 0 \iff s = \text{empty\_set}$) tff(cardinality_empty_set, axiom)
$\forall x$: element, s: set: ($\text{intersection}(\text{singleton}(x), s) = \text{singleton}(x) \iff \text{cardinality}(\text{union}(\text{singleton}(x), s)) = \text{cardinality}(s)$)
$\forall x$: element, s: set: ($\text{intersection}(\text{singleton}(x), s) = \text{empty\_set} \iff \text{cardinality}(\text{union}(\text{singleton}(x), s)) = \text{sum}(\text{cardinality}(s),$
$\forall s$: set, t: set: ($\text{cardinality}(\text{intersection}(s, t)) = 0 \iff \text{intersection}(s, t) = \text{empty\_set}$) tff($\text{cardinality\_intersection}_3$, axiom)
$\forall a$: set, b: set: ($\text{intersection}(a, b) = \text{empty\_set} \iff \text{cardinality}(\text{union}(a, b)) = \text{sum}(\text{cardinality}(a), \text{cardinality}(b))$) tff(car
$\forall c$: set, a_0: set, a_1: set, a_2: set, x_1: element, x_2: element, x_3: element: (($c \subseteq a_0$ and $\neg\, x_1 \in a_0$ and $\text{union}(a_0, \text{singleton}(x_1)) \subseteq$ a_1 and $\neg\, x_2 \in a_1$ and $\text{union}(a_1, \text{singleton}(x_2)) \subseteq a_2$ and $\neg\, x_3 \in a_2) \Rightarrow \text{cardinality}(\text{union}(\text{union}(\text{union}(c, \text{singleton}(x_1)), \text{single}$
$\text{sum}(\text{cardinality}(c), 3))$ tff(vc_5, conjecture)

SEV426=1.p Bound on the number of allocated objects in a recursive function
Bound on the number of allocated objects in a recursive function that incorporates container C into another container.
set: $tType tff(set_type, type)
element: $tType tff(element_type, type)
empty_set: set tff(empty_set_type, type)
singleton: element → set tff(singleton_type, type)
$\in$: (element × set) → $o tff(member_type, type)
$\subseteq$: (set × set) → $o tff(subset_type, type)
intersection: (set × set) → set tff(intersection_type, type)
union: (set × set) → set tff(union_type, type)
\: (set × set) → set tff(difference_type, type)
complement: set → set tff(complement_type, type)
cardinality: set → $int tff(cardinality_type, type)
$\forall s$: set: ($\forall x$: element: $\neg\, x \in s \iff s = \text{empty\_set}$) tff(empty_set, axiom)
$\forall x$: element, a: element: ($x \in \text{singleton}(a) \iff x = a$) tff(singleton, axiom)
$\forall a$: set, b: set: ($a \subseteq b \iff \forall x$: element: ($x \in a \Rightarrow x \in b$)) tff(subset, axiom)
$\forall x$: element, a: set, b: set: ($x \in \text{intersection}(a, b) \iff (x \in a$ and $x \in b)$) tff(intersection, axiom)
$\forall x$: element, a: set, b: set: ($x \in \text{union}(a, b) \iff (x \in a$ or $x \in b)$) tff(union, axiom)
$\forall b$: element, a: set, e: set: ($b \in (e \setminus a) \iff (b \in e$ and $\neg\, b \in a)$) tff(difference, axiom)
$\forall x$: element, s: set: ($x \in s \iff \neg\, x \in s'$) tff(complement, axiom)
$\forall s$: set: ($\text{cardinality}(s) = 0 \iff s = \text{empty\_set}$) tff(cardinality_empty_set, axiom)
$\forall x$: element, s: set: ($\text{intersection}(\text{singleton}(x), s) = \text{singleton}(x) \iff \text{cardinality}(\text{union}(\text{singleton}(x), s)) = \text{cardinality}(s)$)
$\forall x$: element, s: set: ($\text{intersection}(\text{singleton}(x), s) = \text{empty\_set} \iff \text{cardinality}(\text{union}(\text{singleton}(x), s)) = \text{sum}(\text{cardinality}(s),$
$\forall s$: set, t: set: ($\text{cardinality}(\text{intersection}(s, t)) = 0 \iff \text{intersection}(s, t) = \text{empty\_set}$) tff($\text{cardinality\_intersection}_3$, axiom)
$\forall a$: set, b: set: ($\text{intersection}(a, b) = \text{empty\_set} \iff \text{cardinality}(\text{union}(a, b)) = \text{sum}(\text{cardinality}(a), \text{cardinality}(b))$) tff(car
$\forall x$: element, c: set, c_1: set, a_0: set, a_1: set, a_2: set: (($x \in c$ and $c_1 = c \setminus \text{singleton}(x)$ and $\text{lesseq}(\text{cardinality}(a_1 \setminus$
$a_0), 1)$ and $\text{lesseq}(\text{cardinality}(a_2 \setminus a_1), \text{cardinality}(c_1))) \Rightarrow \text{lesseq}(\text{cardinality}(a_2 \setminus a_0), \text{cardinality}(c)))$ tff(vc_6, conjecture)

SEV427^1.p If two sets cover a type, a choice function must give an element
eps: ($i → $o) → $i thf(eps, type)
∀p: $i → $o: (∃$x$: $i: ($p$@$x$) ⇒ ($p$@(eps@$p$))) thf(choiceax, axiom)
p: $i → $o thf($p$, type)
q: $i → $o thf($q$, type)
∀x: $i: ($p$@$x$ or q@x) thf(pq, axiom)
p@(eps@p) or q@(eps@q) thf(conj, conjecture)

SEV428^1.p If a union is nonempty we can choose a nonempty set in the set.
eps: ($i → $o) → $i thf(eps, type)
∀p: $i → $o: (∃$x$: $i: ($p$@$x$) ⇒ ($p$@(eps@$p$))) thf(choiceax, axiom)
epsio: (($i → $o) → $o) → $i → $o thf(epsio, type)
∀p: ($i → $o) → $o: (∃$x$: $i → $o: ($p$@$x$) ⇒ ($p$@(epsio@$p$))) thf(choiceaxio, axiom)
setunion: (($i → $o) → $o) → $i → $o thf(setunion, type)
setunion = (λc: ($i → $o) → $o, x: $i: ∃$y$: $i → $o: ($c$@$y$ and y@x)) thf(setuniond, definition)
choosenonempty: (($i → $o) → $o) → $i → $o thf(choosenonempty, type)
choosenonempty = (λc: ($i → $o) → $o: (epsio@λ$y$: $i → $o: ($c$@$y$ and y@(eps@y)))) thf(choosenonemptyd, definition)
c: ($i → $o) → $o thf($c$, type)
a: $i thf($a$, type)
setunion@c@a thf(ca, axiom)
c@(choosenonempty@c) and ∃x: $i: (choosenonempty@$c$@$x$) thf(conj, conjecture)

SEV429^1.p Injective functions f:I→I have left inverses
f: $i → $i thf($f$, type)
∀x: $i, y: $i: (($f$@$x$) = ($f$@$y$) ⇒ $x = y$) thf(finj, axiom)
∃g: $i → $i: ∀$x$: $i: ($g$@($f$@$x$)) = x thf(invexists, conjecture)

SEV430^1.p Surjective functions f:I→I have right inverses
f: $i → $i thf($f$, type)
∀y: $i: ∃$x$: $i: ($f$@$x$) = y thf(fsurj, axiom)
∃g: $i → $i: ∀$x$: $i: ($f$@($g$@$x$)) = x thf(invexists, conjecture)

SEV431^1.p Injective functions f:A→B have left inverses
a: $tType thf($a$, type)
b: $tType thf($b$, type)
f: $a → $b thf($f$, type)
∀x: $a, y: $a: (($f$@$x$) = ($f$@$y$) ⇒ $x = y$) thf(finj, axiom)
∃g: $b → $a: ∀$x$: $a: ($g$@($f$@$x$)) = x thf(invexists, conjecture)

SEV432^1.p Surjective functions f:A→B have right inverses
a: $tType thf($a$, type)
b: $tType thf($b$, type)
f: $a → $b thf($f$, type)
∀y: $b: ∃$x$: $a: ($f$@$x$) = y thf(fsurj, axiom)
∃g: $b → $a: ∀$x$: $b: ($f$@($g$@$x$)) = x thf(invexists, conjecture)

SEV433^1.p There are at most 2 individuals if there is an injection into o
f: $i → $o thf($f$, type)
∀x: $i, y: $i: (($f$@$x$) = ($f$@$y$) ⇒ $x = y$) thf(finj, axiom)
∀x: $i, y: $i, z: $i: ($x = y$ or $x = z$ or $y = z$) thf(less$_3$, conjecture)

SEV434^1.p There are at most 2 individuals if there is a surjection from o
f: $o → $i thf($f$, type)
∀y: $i: ∃$x$: $o: ($f$@$x$) = y thf(fsurj, axiom)
∀x: $i, y: $i, z: $i: ($x = y$ or $x = z$ or $y = z$) thf(less$_3$, conjecture)

SEV436-1.p Membership and subsets, union, intersection, difference
include('Axioms/SET001-0.ax')
include('Axioms/SET001-1.ax')
include('Axioms/SET001-2.ax')
include('Axioms/SET001-3.ax')

SEV437+1.p Naive set theory based on Goedel's set theory
include('Axioms/SET006+0.ax')
include('Axioms/SET006+1.ax')

include('Axioms/SET006+2.ax')

SEV438+1.p Order relation (Naive set theory)
include('Axioms/SET006+0.ax')
include('Axioms/SET006+3.ax')

SEV439+1.p Ordinal numbers
include('Axioms/SET006+0.ax')
include('Axioms/SET006+4.ax')

SEV440^1.p Basic set theory, functions, relations
include('Axioms/SET008^0.ax')
include('Axioms/SET008^1.ax')
include('Axioms/SET008^2.ax')

SEV441^1.p Binary relations
include('Axioms/SET009^0.ax')