t62_circtrm1 (TMS7A8AbCZrHb11rhLmrzNNes9E7GiRtkSU)

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Let $v2\_struct\_0 : \iota \Rightarrow o$ be given. Let $v11\_struct\_0 : \iota \Rightarrow o$ be given. Let $l1\_msualg\_1 : \iota \Rightarrow o$ be given. Let $v4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4\_msafree2 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m4\_msaterm : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m3\_msaterm : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2\_msafree2 : \iota \Rightarrow o$ be given. Let $r8\_circtrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1\_dtconstr : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $k5\_msafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5\_trees\_3 : \iota \Rightarrow \iota$ be given. Let $k1\_msaterm : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9\_trees\_9 : \iota \Rightarrow \iota$ be given. Let $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k4\_card\_3 : \iota \Rightarrow \iota$ be given. Let $u3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2\_nat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $np\_\_1 : \iota$ be given. Let $k6\_trees\_1 : \iota \Rightarrow \iota$ be given. Let $k9\_xtuple\_0 : \iota \Rightarrow \iota$ be given. Let $m2\_circtrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1\_circtrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6\_circtrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1\_circtrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7\_circtrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be

given. Let $r7\_circtrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge (l1\_msualg\_1\ X0))) \Rightarrow (\forall X1.((v4\_msualg\_1\ X1\ X0) \wedge ((v4\_msafree2\ X1\ X0) \wedge (l3\_msualg\_1\ X1\ X0))) \Rightarrow (\forall X2.(m4\_msaterm\ X2\ X0\ X1) \Rightarrow (\forall X3.(m3\_msaterm\ X3\ X0\ X2) \Rightarrow (\forall X4.((\neg v2\_struct\_0\ X4) \wedge ((\neg v11\_struct\_0\ X4) \wedge ((v2\_msafree2\ X4) \wedge (l1\_msualg\_1\ X4)))) \Rightarrow (\forall X5.((v4\_msualg\_1\ X5\ X4) \wedge ((v4\_msafree2\ X5\ X4) \wedge (l3\_msualg\_1\ X5\ X4))) \Rightarrow ((r7\_circtrm1\ X0\ X1\ X2\ X3\ X4\ X5) \Rightarrow (\forall X6.(m1\_dtconstr\ X6\ (u1\_struct\_0\ (k5\_msafree\ X0\ X2))\ (k5\_trees\_3\ (u1\_struct\_0\ (k5\_msafree\ X0\ X2)))\ (k1\_msaterm\ X0\ X2)) \Rightarrow (\neg(X6 \in k9\_trees\_9\ X3) \wedge (\forall X7.(m1\_subset\_1\ X7\ (u1\_struct\_0\ X4)) \Rightarrow (\neg\forall X8.(m1\_subset\_1\ X8\ (k4\_card\_3\ (u3\_msualg\_1\ X4\ X5))) \Rightarrow ((r1\_facirc\_1\ X4\ X5\ (k5\_facirc\_1\ X4\ X5\ X8\ (k2\_nat\_1\ np\_\_1\ (k6\_trees\_1\ (k9\_xtuple\_0\ X6))))\ X7) \wedge (\exists X9.(m2\_circtrm1\ X9\ X0\ X2\ X1\ X3\ X4\ X5) \wedge (\forall X10.(m1\_subset\_1\ X10\ (k4\_card\_3\ (u3\_msualg\_1\ (k1\_circtrm1\ X0\ X2\ X3)\ (k6\_circtrm1\ X0\ X2\ X3\ X1)))) \Rightarrow ((X10 = k3\_relat\_1\ X9\ X8) \Rightarrow (\forall X11.(m1\_circtrm1\ X11\ X0\ X2\ X3\ X1\ X10) \Rightarrow (k1\_funct\_1\ (k5\_facirc\_1\ X4\ X5\ X8\ (k2\_nat\_1\ np\_\_1\ (k6\_trees\_1\ (k9\_xtuple\_0\ X6))))\ X7 = k7\_circtrm1\ X0\ X1\ X2\ X6\ X11)))))))))))))))) \tag{1}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge (l1\_msualg\_1\ X0))) \Rightarrow (\forall X1.((v4\_msualg\_1\ X1\ X0) \wedge ((v4\_msafree2\ X1\ X0) \wedge (l3\_msualg\_1\ X1\ X0))) \Rightarrow (\forall X2.(m4\_msaterm\ X2\ X0\ X1) \Rightarrow (\forall X3.(m3\_msaterm\ X3\ X0\ X2) \Rightarrow (\forall X4.((\neg v2\_struct\_0\ X4) \wedge ((\neg v11\_struct\_0\ X4) \wedge ((v2\_msafree2\ X4) \wedge (l1\_msualg\_1\ X4)))) \Rightarrow (\forall X5.((v4\_msualg\_1\ X5\ X4) \wedge ((v4\_msafree2\ X5\ X4) \wedge (l3\_msualg\_1\ X5\ X4))) \Rightarrow ((r8\_circtrm1\ X0\ X1\ X2\ X3\ X4\ X5) \Rightarrow (r7\_circtrm1\ X0\ X1\ X2\ X3\ X4\ X5)))))))) \tag{2}$$

Theorem 1

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge(l1\_msualg\_1\ X0)))\Rightarrow(\forall X1.((v4\_msualg\_1\ X1\ X0)\wedge((v4\_msafree2\ X1\ X0)\wedge(l3\_msualg\_1\ X1\ X0)))\Rightarrow(\forall X2.(m4\_msaterm\ X2\ X0\ X1)\Rightarrow(\forall X3.(m3\_msaterm\ X3\ X0\ X2)\Rightarrow(\forall X4.((\neg v2\_struct\_0\ X4)\wedge((\neg v11\_struct\_0\ X4)\wedge((v2\_msafree2\ X4)\wedge(l1\_msualg\_1\ X4))))\Rightarrow(\forall X5.((v4\_msualg\_1\ X5\ X4)\wedge((v4\_msafree2\ X5\ X4)\wedge(l3\_msualg\_1\ X5\ X4)))\Rightarrow((r8\_circtrm1\ X0\ X1\ X2\ X3\ X4\ X5)\Rightarrow(\forall X6.(m1\_dtconstr\ X6\ (u1\_struct\_0\ (k5\_msafree\ X0\ X2))\ (k5\_trees\_3\ (u1\_struct\_0\ (k5\_msafree\ X0\ X2)))\ (k1\_msaterm\ X0\ X2))\Rightarrow(\neg(X6\in k9\_trees\_9\ X3)\wedge(\forall X7.(m1\_subset\_1\ X7\ (u1\_struct\_0\ X4))\Rightarrow(\neg\forall X8.(m1\_subset\_1\ X8\ (k4\_card\_3\ (u3\_msualg\_1\ X4\ X5)))\Rightarrow((r1\_facirc\_1\ X4\ X5\ (k5\_facirc\_1\ X4\ X5\ X8\ (k2\_nat\_1\ np\_\_1\ (k6\_trees\_1\ (k9\_xtuple\_0\ X6))))\ X7)\wedge(\exists X9.(m2\_circtrm1\ X9\ X0\ X2\ X1\ X3\ X4\ X5)\wedge(\forall X10.(m1\_subset\_1\ X10\ (k4\_card\_3\ (u3\_msualg\_1\ (k1\_circtrm1\ X0\ X2\ X3)\ (k6\_circtrm1\ X0\ X2\ X3\ X1))))\Rightarrow((X10=k3\_relat\_1\ X9\ X8)\Rightarrow(\forall X11.(m1\_circtrm1\ X11\ X0\ X2\ X3\ X1\ X10)\Rightarrow(k1\_funct\_1\ (k5\_facirc\_1\ X4\ X5\ X8\ (k2\_nat\_1\ np\_\_1\ (k6\_trees\_1\ (k9\_xtuple\_0\ X6))))\ X7=k7\_circtrm1\ X0\ X1\ X2\ X6\ X11))))))))))))))))$$