

t1_osafree (TMQTvCbzvM- sXLu8HLw6WDsN7uV9FbSKdxcM)

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Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $v4_osalg_1 : \iota \Rightarrow o$ be given. Let $v5_osalg_1 : \iota \Rightarrow o$ be given. Let $l3_osalg_1 : \iota \Rightarrow o$ be given. Let $v3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v12_osalg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m3_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_osafree : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m2_osalg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_osalg_2 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k10_osalg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_msualg_1 : \iota \Rightarrow o$ be given. Let $m1_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $g3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u4_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v4_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l2_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l5_struct_0 : \iota \Rightarrow o$ be given. Let $l1_osalg_1 : \iota \Rightarrow o$ be given. Let $l2_osalg_1 : \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (\forall X2.(m1_msualg_2 \\ & \quad X2 X0 X1) \Rightarrow (\forall X3.(m1_msualg_2 X3 X0 X1) \Rightarrow ((r8_pboole (u1_struct_0 \\ & \quad X0) (u3_msualg_1 X0 X2) (u3_msualg_1 X0 X3)) \Rightarrow (g3_msualg_1 X0 (u3_msualg_1 \\ & \quad X0 X2) (u4_msualg_1 X0 X2) = g3_msualg_1 X0 (u3_msualg_1 X0 X3) (u4_msualg_1 \\ & \quad X0 X3)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (\forall X2.(l3_msualg_1 \\ & \quad X2 X0) \Rightarrow ((g3_msualg_1 X0 (u3_msualg_1 X0 X1) (u4_msualg_1 X0 X1) = \\ & \quad g3_msualg_1 X0 (u3_msualg_1 X0 X2) (u4_msualg_1 X0 X2)) \Rightarrow (m1_msualg_2 \\ & \quad X1 X0 X2)))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((\neg v1_xboole_0 X0)\wedge(((v1_relat_1 \\ & X1)\wedge((v4_relat_1 X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge \\ & ((v1_relat_1 X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 \\ & X2 X0))))))\Rightarrow((r8_pboole X0 X1 X2)\Leftrightarrow(X1 = X2)) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(l1_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u1_struct_0 X0)) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((l1_struct_0 X0)\wedge(l2_msualg_1 X1 X0))\Rightarrow \\ & ((v1_relat_1 (u3_msualg_1 X0 X1))\wedge((v4_relat_1 (u3_msualg_1 \\ & X0 X1) (u1_struct_0 X0))\wedge((v1_funct_1 (u3_msualg_1 X0 X1))\wedge(v1_partfun1 \\ & (u3_msualg_1 X0 X1) (u1_struct_0 X0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\ & (l1_msualg_1 X0)))\wedge(l3_msualg_1 X1 X0))\Rightarrow(\forall X2.(m1_msualg_2 \\ & X2 X0 X1)\Rightarrow(l3_msualg_1 X2 X0)) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.(l5_struct_0 X0)\Rightarrow(l1_struct_0 X0) \quad (7)$$

Assume the following.

$$\forall X0.(l3_osalg_1 X0)\Rightarrow((l1_osalg_1 X0)\wedge(l2_osalg_1 X0)) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge(l1_msualg_1 X0))\Rightarrow(\forall X1. \\ & (l3_msualg_1 X1 X0)\Rightarrow(l2_msualg_1 X1 X0)) \end{aligned} \quad (9)$$

Assume the following.

$$\forall X0.(l1_osalg_1 X0)\Rightarrow(l1_msualg_1 X0) \quad (10)$$

Assume the following.

$$\forall X0.(l1_msualg_1 X0)\Rightarrow(l5_struct_0 X0) \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\ & X0)\wedge((v4_osalg_1 X0)\wedge((v5_osalg_1 X0)\wedge(l3_osalg_1 X0))))\wedge \\ & (((v12_osalg_1 X1 X0)\wedge(l3_msualg_1 X1 X0))\wedge(m2_osalg_2 X2 X0 X1)))\Rightarrow \\ & ((v3_msualg_1 (k10_osalg_2 X0 X1 X2) X0)\wedge((v12_osalg_1 (k10_osalg_2 \\ & X0 X1 X2) X0)\wedge(m1_msualg_2 (k10_osalg_2 X0 X1 X2) X0 X1))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v4_osalg_1 \\
& X0) \wedge ((v5_osalg_1 X0) \wedge (l3_osalg_1 X0)))))) \Rightarrow (\forall X1.((v12_osalg_1 \\
& X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow (\forall X2.(m3_pboole X2 (u1_struct_0 \\
& X0) (u3_msualg_1 X0 X1)) \Rightarrow ((m1_osafree X2 X0 X1) \Leftrightarrow (\forall X3.(m2_osalg_2 \\
& X3 X0 X1) \Rightarrow ((r8_pboole (u1_struct_0 X0) X3 (k2_osalg_2 X0 X2)) \Rightarrow (\\
& r8_pboole (u1_struct_0 X0) (u3_msualg_1 X0 (k10_osalg_2 X0 X1 X3)) \\
& (u3_msualg_1 X0 X1)))))))))
\end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \wedge \\
& (l3_msualg_1 X1 X0)) \Rightarrow ((v3_msualg_1 X1 X0) \Rightarrow (X1 = g3_msualg_1 X0 \\
& (u3_msualg_1 X0 X1) (u4_msualg_1 X0 X1)))
\end{aligned} \tag{14}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v4_osalg_1 \\
& X0) \wedge ((v5_osalg_1 X0) \wedge (l3_osalg_1 X0)))))) \Rightarrow (\forall X1.((v3_msualg_1 \\
& X1 X0) \wedge ((v4_msualg_1 X1 X0) \wedge ((v12_osalg_1 X1 X0) \wedge (l3_msualg_1 \\
& X1 X0)))) \Rightarrow (\forall X2.(m3_pboole X2 (u1_struct_0 X0) (u3_msualg_1 \\
& X0 X1)) \Rightarrow ((m1_osafree X2 X0 X1) \Leftrightarrow (\forall X3.(m2_osalg_2 X3 X0 X1) \Rightarrow \\
& ((r8_pboole (u1_struct_0 X0) X3 (k2_osalg_2 X0 X2)) \Rightarrow (k10_osalg_2 \\
& X0 X1 X3 = X1))))))
\end{aligned}$$