

t37_msualg_6

(TMH9pQGtmMbwMs3xvUkXMhZ5gkYhU3dPenC)

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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 $l3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_msualg_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k6_msualg_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_msualg_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_msualg_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v4_msualg_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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 $r2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ 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 $v3_msualg_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\ & (\forall X2.((v4_msualg_6 X2 X0 X1) \wedge (m1_msualg_4 X2 (u1_struct_0 \\ & X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1))) \Rightarrow (v4_msualg_6 (k6_msualg_6 \\ & X0 X1 X2) X0 X1))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge (\\ & v1_funct_1 X1) \wedge (v1_partfun1 X1 X0))) \Rightarrow (\forall X2. ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))) \Rightarrow \\ & (\forall X3. ((v1_relat_1 X3) \wedge ((v4_relat_1 X3 X0) \wedge ((v1_funct_1 \\ & X3) \wedge (v1_partfun1 X3 X0)))) \Rightarrow (((r2_pboole X0 X1 X2) \wedge (r2_pboole \\ & X0 X2 X3)) \Rightarrow (r2_pboole X0 X1 X3))) \end{aligned} \tag{2}$$

Assume the following.

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

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.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((v1_relat_1 X1) \wedge ((v4_relat_1 \\ & X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \wedge ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))))) \Rightarrow \\ & (\forall X3. (m1_msualg_4 X3 X0 X1 X2) \Rightarrow ((v1_relat_1 X3) \wedge ((v4_relat_1 \\ & X3 X0) \wedge ((v1_funct_1 X3) \wedge (v1_partfun1 X3 X0)))))) \end{aligned} \quad (6)$$

Assume the following.

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

Assume the following.

$$\forall X0. ((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (l2_msualg_1 X1 X0)) \quad (8)$$

Assume the following.

$$\forall X0. (l1_msualg_1 X0) \Rightarrow (l5_struct_0 X0) \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge (l1_msualg_1 X0))) \wedge (((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 \\ & X0)) \wedge (m1_msualg_4 X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\ & X0 X1)))) \Rightarrow ((v3_msualg_6 (k8_msualg_6 X0 X1 X2) X0 X1) \wedge ((v4_msualg_6 \\ & (k8_msualg_6 X0 X1 X2) X0 X1) \wedge (m1_msualg_4 (k8_msualg_6 X0 X1 X2) \\ & (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge (l1_msualg_1 X0))) \wedge (((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 \\ & X0)) \wedge (m1_msualg_4 X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\ & X0 X1)))) \Rightarrow ((v4_msualg_6 (k7_msualg_6 X0 X1 X2) X0 X1) \wedge (m1_msualg_4 \\ & (k7_msualg_6 X0 X1 X2) (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\ & X0 X1))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\
& X0)\wedge(l1_msualg_1 X0)))\wedge(((v4_msualg_1 X1 X0)\wedge(l3_msualg_1 X1 \\
& X0))\wedge(m1_msualg_4 X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\
& X0 X1))))\Rightarrow((v3_msualg_6 (k6_msualg_6 X0 X1 X2) X0 X1)\wedge(m1_msualg_4 \\
& (k6_msualg_6 X0 X1 X2) (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\
& X0 X1)))
\end{aligned} \tag{12}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 \\
& X0)))\Rightarrow(\forall X1.((v4_msualg_1 X1 X0)\wedge(l3_msualg_1 X1 X0))\Rightarrow \\
& (\forall X2.(m1_msualg_4 X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) \\
& (u3_msualg_1 X0 X1))\Rightarrow(\forall X3.((v3_msualg_6 X3 X0 X1)\wedge((v4_msualg_6 \\
& X3 X0 X1)\wedge(m1_msualg_4 X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (\\
& u3_msualg_1 X0 X1))))\Rightarrow((X3 = k8_msualg_6 X0 X1 X2)\Leftrightarrow((r2_pboole \\
& (u1_struct_0 X0) X2 X3)\wedge(\forall X4.((v3_msualg_6 X4 X0 X1)\wedge((\\
& v4_msualg_6 X4 X0 X1)\wedge(m1_msualg_4 X4 (u1_struct_0 X0) (u3_msualg_1 \\
& X0 X1) (u3_msualg_1 X0 X1))))\Rightarrow((r2_pboole (u1_struct_0 X0) X2 X4)\Rightarrow \\
& (r2_pboole (u1_struct_0 X0) X3 X4))))))
\end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 \\
& X0)))\Rightarrow(\forall X1.((v4_msualg_1 X1 X0)\wedge(l3_msualg_1 X1 X0))\Rightarrow \\
& (\forall X2.(m1_msualg_4 X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) \\
& (u3_msualg_1 X0 X1))\Rightarrow(\forall X3.((v4_msualg_6 X3 X0 X1)\wedge(m1_msualg_4 \\
& X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))\Rightarrow(\\
& (X3 = k7_msualg_6 X0 X1 X2)\Leftrightarrow((r2_pboole (u1_struct_0 X0) X2 X3)\wedge \\
& (\forall X4.((v4_msualg_6 X4 X0 X1)\wedge(m1_msualg_4 X4 (u1_struct_0 \\
& X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1))))\Rightarrow((r2_pboole (u1_struct_0 \\
& X0) X2 X4)\Rightarrow(r2_pboole (u1_struct_0 X0) X3 X4))))))
\end{aligned} \tag{14}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 \\
& X0)))\Rightarrow(\forall X1.((v4_msualg_1 X1 X0)\wedge(l3_msualg_1 X1 X0))\Rightarrow \\
& (\forall X2.(m1_msualg_4 X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) \\
& (u3_msualg_1 X0 X1))\Rightarrow(\forall X3.((v3_msualg_6 X3 X0 X1)\wedge(m1_msualg_4 \\
& X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))\Rightarrow(\\
& (X3 = k6_msualg_6 X0 X1 X2)\Leftrightarrow((r2_pboole (u1_struct_0 X0) X2 X3)\wedge \\
& (\forall X4.((v3_msualg_6 X4 X0 X1)\wedge(m1_msualg_4 X4 (u1_struct_0 \\
& X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1))))\Rightarrow((r2_pboole (u1_struct_0 \\
& X0) X2 X4)\Rightarrow(r2_pboole (u1_struct_0 X0) X3 X4))))))
\end{aligned} \tag{15}$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\ & (\forall X2.(m1_msualg_4 X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) \\ & (u3_msualg_1 X0 X1)) \Rightarrow (r8_pboole (u1_struct_0 X0) (k6_msualg_6 \\ & X0 X1 (k7_msualg_6 X0 X1 X2)) (k8_msualg_6 X0 X1 X2)))) \end{aligned}$$