

t16_msualg_9

(TMZtq2m8BVLfvKXCeok2u5ZjzrRV4K4PiTV)

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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 $m2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r3_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r6_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k6_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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 $r5_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l2_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l5_struct_0 : \iota \Rightarrow o$ be given. Let $v3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_msualg_3 : \iota \Rightarrow o$ be given. Let $v2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r4_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\
& (\forall X2.((v4_msualg_1 X2 X0) \wedge (l3_msualg_1 X2 X0)) \Rightarrow (\forall X3. \\
& (m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow (\neg (r1_msualg_3 X0 X1 X2 X3) \wedge (\forall X4.(m2_pboole X4 (\\
& u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 (k6_msualg_3 X0 X1 X2 X3))) \Rightarrow (\neg (r8_pboole (u1_struct_0 X0) X3 X4) \wedge (r2_msualg_3 X0 X1 (k6_msualg_3 X0 X1 X2 X3) X4))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. ((\neg v1_xboole_0 X0) \wedge (((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \wedge \\
& ((v1_relat_1 X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))))) \Rightarrow ((r8_pboole X0 X1 X2) \Leftrightarrow (X1 = X2))
\end{aligned} \tag{2}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 X0)))\wedge((l3_msualg_1 X1 X0)\wedge(l3_msualg_1 X2 X0)))\Rightarrow((r6_msualg_3 X0 X1 X2)\Leftrightarrow(r5_msualg_3 X0 X1 X2)) \quad (3)$$

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.

$$\forall X0.\forall X1.((l1_struct_0 X0)\wedge(l2_msualg_1 X1 X0))\Rightarrow((v1_relat_1 (u3_msualg_1 X0 X1))\wedge((v4_relat_1 (u3_msualg_1 X0 X1) (u1_struct_0 X0))\wedge((v1_funct_1 (u3_msualg_1 X0 X1))\wedge(v1_partfun1 (u3_msualg_1 X0 X1) (u1_struct_0 X0)))))) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v1_relat_1 X1)\wedge((v4_relat_1 X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge((v1_relat_1 X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))))\Rightarrow(\forall X3.(m2_pboole X3 X0 X1 X2)\Rightarrow((v1_relat_1 X3)\wedge((v4_relat_1 X3 X0)\wedge((v1_funct_1 X3)\wedge(v1_partfun1 X3 X0)))))) \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 X0)))\wedge(l3_msualg_1 X1 X0))\Rightarrow(\forall X2.(m1_msualg_2 X2 X0 X1)\Rightarrow(l3_msualg_1 X2 X0)) \quad (7)$$

Assume the following.

$$\forall X0.(l5_struct_0 X0)\Rightarrow(l1_struct_0 X0) \quad (8)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(l1_msualg_1 X0))\Rightarrow(\forall X1.(l3_msualg_1 X1 X0)\Rightarrow(l2_msualg_1 X1 X0)) \quad (9)$$

Assume the following.

$$\forall X0.(l1_msualg_1 X0)\Rightarrow(l5_struct_0 X0) \quad (10)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 X0)))\wedge((v4_msualg_1 X1 X0)\wedge(l3_msualg_1 X1 X0))\wedge((v4_msualg_1 X2 X0)\wedge(l3_msualg_1 X2 X0))\wedge(m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2))))\Rightarrow((v3_msualg_1 (k6_msualg_3 X0 X1 X2 X3) X0)\wedge((v4_msualg_1 (k6_msualg_3 X0 X1 X2 X3) X0)\wedge(m1_msualg_2 (k6_msualg_3 X0 X1 X2 X3) X0 X2))) \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (\forall X2.(l3_msualg_1 \\ & \quad X2 X0) \Rightarrow (\forall X3.(m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 \\ & \quad X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow ((r3_msualg_3 X0 X1 X2 X3) \Leftrightarrow ((r1_msualg_3 \\ & \quad X0 X1 X2 X3) \wedge (v1_msualg_3 X3)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (\forall X2.(l3_msualg_1 \\ & \quad X2 X0) \Rightarrow (\forall X3.(m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 \\ & \quad X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow ((r2_msualg_3 X0 X1 X2 X3) \Leftrightarrow ((r1_msualg_3 \\ & \quad X0 X1 X2 X3) \wedge (v2_msualg_3 X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) \\ & \quad (u3_msualg_1 X0 X2)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (\forall X2.(l3_msualg_1 \\ & \quad X2 X0) \Rightarrow ((r5_msualg_3 X0 X1 X2) \Leftrightarrow (\exists X3.(m2_pboole X3 (u1_struct_0 \\ & \quad X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2)) \wedge (r4_msualg_3 X0 X1 \\ & \quad X2 X3)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (\forall X2.(l3_msualg_1 \\ & \quad X2 X0) \Rightarrow (\forall X3.(m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 \\ & \quad X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow ((r4_msualg_3 X0 X1 X2 X3) \Leftrightarrow ((r2_msualg_3 \\ & \quad X0 X1 X2 X3) \wedge (r3_msualg_3 X0 X1 X2 X3)))))) \end{aligned} \quad (15)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\ & \quad (\forall X2.((v4_msualg_1 X2 X0) \wedge (l3_msualg_1 X2 X0)) \Rightarrow (\forall X3. \\ & \quad (m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\ & \quad X0 X2)) \Rightarrow ((r3_msualg_3 X0 X1 X2 X3) \Rightarrow (r6_msualg_3 X0 X1 (k6_msualg_3 \\ & \quad X0 X1 X2 X3)))))) \end{aligned}$$