

t22_msualg_3 (TMcBEKCum- NCG8Zyg4wWRw54HPtSZt9RrVFw)

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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 $m1_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r3_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r1_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r4_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r5_msualg_3 : \iota \Rightarrow \iota \Rightarrow o$ 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 $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l2_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l5_struct_0 : \iota \Rightarrow o$ be given. Let $v1_msualg_3 : \iota \Rightarrow o$ be given. Let $r2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (r1_msualg_3 X0 X1 X1 (k2_msualg_3 \\ & (u1_struct_0 X0) (u3_msualg_1 X0 X1)))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow ((r4_msualg_3 X0 X1 X1 (\\ & k2_msualg_3 (u1_struct_0 X0) (u3_msualg_1 X0 X1))) \wedge (r5_msualg_3 \\ & X0 X1 X1))) \end{aligned} \quad (2)$$

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.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\
& X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\
& (\forall X2.((v4_msualg_1 X2 X0) \wedge (l3_msualg_1 X2 X0)) \Rightarrow (\forall X3. \\
& ((v4_msualg_1 X3 X0) \wedge (m1_msualg_2 X3 X0 X2)) \Rightarrow (\forall X4.(m2_pboole \\
& X4 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow (\forall X5. \\
& (m2_pboole X5 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\
& X0 X3)) \Rightarrow (((r8_pboole (u1_struct_0 X0) X4 X5) \wedge (r1_msualg_3 X0 X1 \\
& X3 X5)) \Rightarrow (r1_msualg_3 X0 X1 X2 X4))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l1_struct_0 X0)) \Rightarrow (\neg v1_xboole_0 (u1_struct_0 X0)) \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.((l1_struct_0 X0) \wedge (l2_msualg_1 X1 X0)) \Rightarrow \\
& ((v1_relat_1 (u3_msualg_1 X0 X1)) \wedge ((v4_relat_1 (u3_msualg_1 \\
& X0 X1) (u1_struct_0 X0)) \wedge ((v1_funct_1 (u3_msualg_1 X0 X1)) \wedge (v1_partfun1 \\
& (u3_msualg_1 X0 X1) (u1_struct_0 X0))))))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))))) \Rightarrow \\
& (\forall X3.(m2_pboole X3 X0 X1 X2) \Rightarrow ((v1_relat_1 X3) \wedge ((v4_relat_1 \\
& X3 X0) \wedge ((v1_funct_1 X3) \wedge (v1_partfun1 X3 X0))))))
\end{aligned} \tag{7}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 X0))) \wedge (l3_msualg_1 X1 X0)) \Rightarrow (\forall X2.(m1_msualg_2 X2 X0 X1) \Rightarrow (l3_msualg_1 X2 X0)) \tag{8}$$

Assume the following.

$$\forall X0.(l5_struct_0 X0) \Rightarrow (l1_struct_0 X0) \tag{9}$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (l2_msualg_1 X1 X0)) \tag{10}$$

Assume the following.

$$\forall X0.(l1_msualg_1 X0) \Rightarrow (l5_struct_0 X0) \tag{11}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge \\ & (v1_funct_1 X1) \wedge (v1_partfun1 X1 X0))) \Rightarrow (m2_pboole (k2_msualg_3 \\ & X0 X1) X0 X1 X1) \end{aligned} \tag{12}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (\forall X2. (l3_msualg_1 \\ & X2 X0) \Rightarrow (\forall X3. (m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 \\ & X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow ((r3_msualg_3 X0 X1 X2 X3) \Leftrightarrow ((r1_msualg_3 \\ & X0 X1 X2 X3) \wedge (v1_msualg_3 X3)))))) \end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (\forall X2. (l3_msualg_1 \\ & X2 X0) \Rightarrow (\forall X3. (m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 \\ & X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow ((r4_msualg_3 X0 X1 X2 X3) \Leftrightarrow ((r2_msualg_3 \\ & X0 X1 X2 X3) \wedge (r3_msualg_3 X0 X1 X2 X3)))))) \end{aligned} \tag{14}$$

Theorem 1

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1. ((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\ & (\forall X2. ((v4_msualg_1 X2 X0) \wedge (m1_msualg_2 X2 X0 X1)) \Rightarrow (\forall X3. \\ & (m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 X0 X2) (u3_msualg_1 \\ & X0 X1)) \Rightarrow ((r8_pboole (u1_struct_0 X0) X3 (k2_msualg_3 (u1_struct_0 \\ & X0) (u3_msualg_1 X0 X2)) \Rightarrow (r3_msualg_3 X0 X2 X1 X3)))))) \end{aligned}$$