

t35_msualg_9

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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 $v2_msualg_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v3_msualg_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_msualg_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k13_msualg_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_msualg_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k15_msualg_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\ & (\forall X2.((v2_msualg_4 X2 X0 X1) \wedge ((v3_msualg_4 X2 X0 X1) \wedge (m1_msualg_4 \\ & X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))) \Rightarrow \\ & (r2_msualg_3 X0 X1 (k13_msualg_4 X0 X1 X2) (k15_msualg_4 X0 X1 X2)))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\
& X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\
& (\forall X2.((v2_msualg_4 X2 X0 X1) \wedge ((v3_msualg_4 X2 X0 X1) \wedge (m1_msualg_4 \\
& X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))) \Rightarrow \\
& (\forall X3.((v2_msualg_4 X3 X0 X1) \wedge ((v3_msualg_4 X3 X0 X1) \wedge (m1_msualg_4 \\
& X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))) \Rightarrow \\
& (\forall X4.(m2_pboole X4 (u1_struct_0 X0) (u3_msualg_1 X0 (k13_msualg_4 \\
& X0 X1 X2)) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3))) \Rightarrow ((\forall X5. \\
& (m1_subset_1 X5 (u1_struct_0 X0)) \Rightarrow (\forall X6.(m1_subset_1 X6 \\
& (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X2)) X5)) \Rightarrow (\forall X7. \\
& (m1_subset_1 X7 (k1_funct_1 (u3_msualg_1 X0 X1) X5)) \Rightarrow ((X6 = k3_msualg_4 \\
& X0 X1 X2 X5 X7) \Rightarrow (k3_funct_2 (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 \\
& X0 X1 X2)) X5) (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3)) \\
& X5) (k1_msualg_3 (u1_struct_0 X0) (u3_msualg_1 X0 (k13_msualg_4 \\
& X0 X1 X2)) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3)) X4 X5) X6 = k3_msualg_4 \\
& X0 X1 X3 X5 X7)))) \Rightarrow (r8_pboole (u1_struct_0 X0) (k3_msualg_3 (u1_struct_0 \\
& X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X2)) \\
& (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3)) (k15_msualg_4 X0 X1 X2) \\
& X4) (k15_msualg_4 X0 X1 X3))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\
& X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\
& (\forall X2.((v4_msualg_1 X2 X0) \wedge (l3_msualg_1 X2 X0)) \Rightarrow (\forall X3. \\
& ((v4_msualg_1 X3 X0) \wedge (l3_msualg_1 X3 X0)) \Rightarrow (\forall X4.(m2_pboole \\
& X4 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow (\forall X5. \\
& (m2_pboole X5 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\
& X0 X3)) \Rightarrow (((r2_msualg_3 X0 X1 X2 X4) \wedge (r1_msualg_3 X0 X1 X3 X5)) \Rightarrow (\\
& \forall X6.(m2_pboole X6 (u1_struct_0 X0) (u3_msualg_1 X0 X2) (\\
& u3_msualg_1 X0 X3)) \Rightarrow ((r8_pboole (u1_struct_0 X0) (k3_msualg_3 \\
& (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2) (u3_msualg_1 \\
& X0 X3) X4 X6) X5) \Rightarrow (r1_msualg_3 X0 X2 X3 X6))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\
& X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\
& (\forall X2.((v2_msualg_4 X2 X0 X1) \wedge ((v3_msualg_4 X2 X0 X1) \wedge (m1_msualg_4 \\
& X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))) \Rightarrow \\
& (\forall X3.((v2_msualg_4 X3 X0 X1) \wedge ((v3_msualg_4 X3 X0 X1) \wedge (m1_msualg_4 \\
& X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))) \Rightarrow \\
& (\forall X4.(m2_pboole X4 (u1_struct_0 X0) (u3_msualg_1 X0 (k13_msualg_4 \\
& X0 X1 X2)) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3))) \Rightarrow (\forall X5. \\
& (m1_subset_1 X5 (u1_struct_0 X0)) \Rightarrow (\forall X6.(m1_subset_1 X6 \\
& (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X2)) X5)) \Rightarrow (\forall X7. \\
& (m1_subset_1 X7 (k1_funct_1 (u3_msualg_1 X0 X1) X5)) \Rightarrow ((X6 = k3_msualg_4 \\
& X0 X1 X2 X5 X7) \Rightarrow (k3_funct_2 (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 \\
& X0 X1 X2)) X5) (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3)) \\
& X5) (k1_msualg_3 (u1_struct_0 X0) (u3_msualg_1 X0 (k13_msualg_4 \\
& X0 X1 X2)) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3)) X4 X5) X6 = k3_msualg_4 \\
& X0 X1 X3 X5 X7)))))) \Rightarrow (v2_msualg_3 X4 (u1_struct_0 X0) (u3_msualg_1 \\
& X0 (k13_msualg_4 X0 X1 X2)) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3))))))))) \\
& \tag{4}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\
& X0) \wedge (l1_msualg_1 X0))) \wedge (((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 \\
& X0)) \wedge ((v2_msualg_4 X2 X0 X1) \wedge ((v3_msualg_4 X2 X0 X1) \wedge (m1_msualg_4 \\
& X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))))) \Rightarrow \\
& ((v3_msualg_1 (k13_msualg_4 X0 X1 X2) X0) \wedge (v4_msualg_1 (k13_msualg_4 \\
& X0 X1 X2) X0)) \\
& \tag{5}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\
& X0) \wedge (l1_msualg_1 X0))) \wedge (((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 \\
& X0)) \wedge ((v2_msualg_4 X2 X0 X1) \wedge ((v3_msualg_4 X2 X0 X1) \wedge (m1_msualg_4 \\
& X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))))) \Rightarrow \\
& (m2_pboole (k15_msualg_4 X0 X1 X2) (u1_struct_0 X0) (u3_msualg_1 \\
& X0 X1) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X2))) \\
& \tag{6}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\
& X0) \wedge (l1_msualg_1 X0))) \wedge (((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 \\
& X0)) \wedge ((v2_msualg_4 X2 X0 X1) \wedge ((v3_msualg_4 X2 X0 X1) \wedge (m1_msualg_4 \\
& X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))))) \Rightarrow \\
& (l3_msualg_1 (k13_msualg_4 X0 X1 X2) X0) \\
& \tag{7}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\
& \quad X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (\forall X2.(l3_msualg_1 \\
& \quad X2 X0) \Rightarrow (\forall X3.(m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 \\
& \quad X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow ((r2_msualg_3 X0 X1 X2 X3) \Leftrightarrow ((r1_msualg_3 \\
& \quad X0 X1 X2 X3) \wedge (v2_msualg_3 X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) \\
& \quad (u3_msualg_1 X0 X2))))))
\end{aligned} \tag{8}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\
& \quad X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\
& (\forall X2.((v2_msualg_4 X2 X0 X1) \wedge ((v3_msualg_4 X2 X0 X1) \wedge (m1_msualg_4 \\
& \quad X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))) \Rightarrow \\
& (\forall X3.((v2_msualg_4 X3 X0 X1) \wedge ((v3_msualg_4 X3 X0 X1) \wedge (m1_msualg_4 \\
& \quad X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X1)))) \Rightarrow \\
& (\forall X4.(m2_pboole X4 (u1_struct_0 X0) (u3_msualg_1 X0 (k13_msualg_4 \\
& \quad X0 X1 X2)) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3))) \Rightarrow ((\forall X5. \\
& \quad (m1_subset_1 X5 (u1_struct_0 X0)) \Rightarrow (\forall X6.(m1_subset_1 X6 \\
& \quad (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X2)) X5)) \Rightarrow (\forall X7. \\
& (m1_subset_1 X7 (k1_funct_1 (u3_msualg_1 X0 X1) X5)) \Rightarrow ((X6 = k3_msualg_4 \\
& \quad X0 X1 X2 X5 X7) \Rightarrow (k3_funct_2 (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 \\
& \quad X0 X1 X2)) X5) (k1_funct_1 (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3)) \\
& \quad X5) (k1_msualg_3 (u1_struct_0 X0) (u3_msualg_1 X0 (k13_msualg_4 \\
& \quad X0 X1 X2)) (u3_msualg_1 X0 (k13_msualg_4 X0 X1 X3)) X4 X5) X6 = k3_msualg_4 \\
& \quad X0 X1 X3 X5 X7)))))) \Rightarrow (r2_msualg_3 X0 (k13_msualg_4 X0 X1 X2) (k13_msualg_4 \\
& \quad X0 X1 X3) X4))))))
\end{aligned}$$