

t3_msafree
(TMGfnqw53GEsHZ84uHQHxsJ5sHxxPez6R38)

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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 $v3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ 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 $m3_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_msafree : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k12_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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. 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.

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

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & \quad (l1_msualg_1 X0))) \wedge (l3_msualg_1 X1 X0)) \Rightarrow (\exists X2. m1_msafree \\ & \quad X2 X0 X1) \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & \quad (l1_msualg_1 X0))) \wedge (l3_msualg_1 X1 X0)) \Rightarrow (\forall X2. (m1_msualg_2 \\ & \quad X2 X0 X1) \Rightarrow (l3_msualg_1 X2 X0)) \end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & (l1_msualg_1 X0))) \wedge (l3_msualg_1 X1 X0) \Rightarrow (\forall X2. (m1_msafree \\ & X2 X0 X1) \Rightarrow (m3_pboole X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 \\ & X0) \wedge (l1_msualg_1 X0))) \wedge ((l3_msualg_1 X1 X0) \wedge (m3_pboole X2 (u1_struct_0 \\ & X0) (u3_msualg_1 X0 X1))) \Rightarrow ((v3_msualg_1 (k12_msualg_2 X0 X1 X2) \\ & X0) \wedge (m1_msualg_2 (k12_msualg_2 X0 X1 X2) X0 X1)) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0)) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (\forall X2. (m3_pboole \\ & X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1)) \Rightarrow ((m1_msafree X2 X0 X1) \Leftrightarrow \\ & (r8_pboole (u1_struct_0 X0) (u3_msualg_1 X0 (k12_msualg_2 X0 X1 \\ & X2)) (u3_msualg_1 X0 X1)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \wedge \\ & (l3_msualg_1 X1 X0)) \Rightarrow ((v3_msualg_1 X1 X0) \Rightarrow (X1 = g3_msualg_1 X0 \\ & (u3_msualg_1 X0 X1) (u4_msualg_1 X0 X1))) \end{aligned} \quad (8)$$

Theorem 1

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0)) \Rightarrow (\forall X1. ((v3_msualg_1 X1 X0) \wedge ((v4_msualg_1 X1 X0) \wedge \\ & (l3_msualg_1 X1 X0))) \Rightarrow (\forall X2. (m3_pboole X2 (u1_struct_0 \\ & X0) (u3_msualg_1 X0 X1)) \Rightarrow ((m1_msafree X2 X0 X1) \Leftrightarrow (k12_msualg_2 \\ & X0 X1 X2 = X1)))) \end{aligned}$$