

t15\_msualg\_9 (TMYd-  
HVQBUd8Jgd7GQfoWpY3XgrGUHqnUNUK)

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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  $r1\_msualg\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r8\_pboole : \iota \Rightarrow \iota \Rightarrow o$  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. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((\neg v1\_xboole\_0 X0) \wedge (((v1\_relat\_1 \\ & X1) \wedge ((v4\_relat\_1 X1 X0) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0)))))) \wedge \\ & ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 \\ & X2 X0)))))) \Rightarrow ((r8\_pboole X0 X1 X2) \Leftrightarrow (X1 = X2)) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 \\ & X0))) \Rightarrow (\forall X1. ((v4\_msualg\_1 X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \Rightarrow \\ & (\forall X2. ((v4\_msualg\_1 X2 X0) \wedge (l3\_msualg\_1 X2 X0))) \Rightarrow (\forall X3. \\ & ((v4\_msualg\_1 X3 X0) \wedge (m1\_msualg\_2 X3 X0 X2))) \Rightarrow (\forall X4. (m2\_pboole \\ & X4 (u1\_struct\_0 X0) (u3\_msualg\_1 X0 X1) (u3\_msualg\_1 X0 X2))) \Rightarrow (\forall X5. \\ & (m2\_pboole X5 (u1\_struct\_0 X0) (u3\_msualg\_1 X0 X1) (u3\_msualg\_1 \\ & X0 X3))) \Rightarrow (((r8\_pboole (u1\_struct\_0 X0) X4 X5) \wedge (r1\_msualg\_3 X0 X1 \\ & X3 X5)) \Rightarrow (r1\_msualg\_3 X0 X1 X2 X4)))))) \end{aligned} \quad (2)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((l1\_struct\_0 X0) \wedge (l2\_msualg\_1 X1 X0)) \Rightarrow \\ & ((v1\_relat\_1 (u3\_msualg\_1 X0 X1)) \wedge ((v4\_relat\_1 (u3\_msualg\_1 \\ & X0 X1) (u1\_struct\_0 X0)) \wedge ((v1\_funct\_1 (u3\_msualg\_1 X0 X1)) \wedge (v1\_partfun1 \\ & (u3\_msualg\_1 X0 X1) (u1\_struct\_0 X0)))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\ & X1 X0) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0)))) \wedge ((v1\_relat\_1 \\ & X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 X0)))))) \Rightarrow \\ & (\forall X3. (m2\_pboole X3 X0 X1 X2) \Rightarrow ((v1\_relat\_1 X3) \wedge ((v4\_relat\_1 \\ & X3 X0) \wedge ((v1\_funct\_1 X3) \wedge (v1\_partfun1 X3 X0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge \\ & (l1\_msualg\_1 X0))) \wedge (l3\_msualg\_1 X1 X0)) \Rightarrow (\forall X2. (m1\_msualg\_2 \\ & X2 X0 X1) \Rightarrow (l3\_msualg\_1 X2 X0)) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0. (l5\_struct\_0 X0) \Rightarrow (l1\_struct\_0 X0) \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. \\ & (l3\_msualg\_1 X1 X0) \Rightarrow (l2\_msualg\_1 X1 X0)) \end{aligned} \quad (8)$$

Assume the following.

$$\forall X0. (l1\_msualg\_1 X0) \Rightarrow (l5\_struct\_0 X0) \quad (9)$$

**Theorem 1**

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 \\ & X0))) \Rightarrow (\forall X1. ((v4\_msualg\_1 X1 X0) \wedge (l3\_msualg\_1 X1 X0)) \Rightarrow \\ & (\forall X2. ((v4\_msualg\_1 X2 X0) \wedge (l3\_msualg\_1 X2 X0)) \Rightarrow (\forall X3. \\ & ((v4\_msualg\_1 X3 X0) \wedge (m1\_msualg\_2 X3 X0 X1)) \Rightarrow (\forall X4. (m2\_pboole \\ & X4 (u1\_struct\_0 X0) (u3\_msualg\_1 X0 X2) (u3\_msualg\_1 X0 X3)) \Rightarrow (( \\ & r1\_msualg\_3 X0 X2 X3 X4) \Rightarrow (\forall X5. (m2\_pboole X5 (u1\_struct\_0 \\ & X0) (u3\_msualg\_1 X0 X2) (u3\_msualg\_1 X0 X1)) \Rightarrow ((r8\_pboole (u1\_struct\_0 \\ & X0) X4 X5) \Rightarrow (r1\_msualg\_3 X0 X2 X1 X5))))))))) \end{aligned}$$