

t19\_pralg\_3  
(TMHvhXrn14ErmwMqupipdTfA2691L4tGT3E)

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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  $m1\_pralg\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k14\_pralg\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_card\_3 : \iota \Rightarrow \iota$  be given. Let  $k9\_pralg\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  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  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $k6\_finseq\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $g3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k10\_pralg\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k10\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k13\_pralg\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 \\ & \quad X0))) \Rightarrow (\forall X1.(l3\_msualg\_1 X1 X0) \Rightarrow (\forall X2.(m1\_subset\_1 \\ & \quad X2 (u4\_struct\_0 X0) \Rightarrow ((k3\_msualg\_1 X0 X2 X1 = k4\_card\_3 (k3\_relat\_1 \\ & \quad (k1\_msualg\_1 X0 X2) (u3\_msualg\_1 X0 X1))) \wedge ((k9\_xtuple\_0 (k3\_relat\_1 \\ & \quad (k1\_msualg\_1 X0 X2) (u3\_msualg\_1 X0 X1)) = k9\_xtuple\_0 (k1\_msualg\_1 \\ & \quad X0 X2)) \wedge (k4\_msualg\_1 X0 X2 X1 = k1\_funct\_1 (u3\_msualg\_1 X0 X1) (k2\_msualg\_1 \\ & \quad X0 X2)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\forall X0. \forall X1. (m1\_subset\_1 X0 X1) \Rightarrow ((v1\_xboole\_0 X1) \vee (X0 \in X1)) \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge(l1\_msualg\_1 \\ & X0))\wedge(((v1\_relat\_1 X1)\wedge((v4\_relat\_1 X1 (u1\_struct\_0 X0))\wedge(( \\ & v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 (u1\_struct\_0 X0))))))\wedge(m2\_pboole \\ & X2 (u4\_struct\_0 X0) (k3\_relat\_1 (u1\_msualg\_1 X0) (k6\_finseq\_2 \\ & (u1\_struct\_0 X0) X1)) (k3\_relat\_1 (u2\_msualg\_1 X0) X1))))\Rightarrow(\forall X3. \\ & \forall X4.\forall X5.(g3\_msualg\_1 X0 X1 X2 = g3\_msualg\_1 X3 X4 X5)\Rightarrow \\ & ((X0 = X3)\wedge((X1 = X4)\wedge(X2 = X5)))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X1)\wedge((\neg v11\_struct\_0 \\ & X1)\wedge(l1\_msualg\_1 X1)))\wedge(m1\_pralg\_2 X2 X0 X1))\Rightarrow(v3\_msualg\_1 ( \\ & k14\_pralg\_2 X0 X1 X2) X1) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X1)\wedge(l1\_msualg\_1 \\ & X1))\wedge(m1\_pralg\_2 X2 X0 X1))\Rightarrow((v1\_relat\_1 (k10\_pralg\_2 X0 X1 X2))\wedge \\ & ((v2\_relat\_1 (k10\_pralg\_2 X0 X1 X2))\wedge((v4\_relat\_1 (k10\_pralg\_2 \\ & X0 X1 X2) (u1\_struct\_0 X1))\wedge((v1\_funct\_1 (k10\_pralg\_2 X0 X1 X2))\wedge \\ & (v1\_partfun1 (k10\_pralg\_2 X0 X1 X2) (u1\_struct\_0 X1)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\ & X1)\wedge(l1\_msualg\_1 X1))\wedge((m1\_subset\_1 X2 (u1\_struct\_0 X1))\wedge(m1\_pralg\_2 \\ & X3 X0 X1)))\Rightarrow((v1\_relat\_1 (k9\_pralg\_2 X0 X1 X2 X3))\wedge((v2\_relat\_1 \\ & (k9\_pralg\_2 X0 X1 X2 X3))\wedge((v4\_relat\_1 (k9\_pralg\_2 X0 X1 X2 X3) X0)\wedge \\ & ((v1\_funct\_1 (k9\_pralg\_2 X0 X1 X2 X3))\wedge(v1\_partfun1 (k9\_pralg\_2 \\ & X0 X1 X2 X3) X0)))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0)\wedge((v2\_relat\_1 X0)\wedge(v1\_funct\_1 X0)))\Rightarrow \\ & (\neg v1\_xboole\_0 (k4\_card\_3 X0)) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X1)\wedge((\neg v11\_struct\_0 \\ & X1)\wedge(l1\_msualg\_1 X1)))\wedge(m1\_pralg\_2 X2 X0 X1))\Rightarrow(v4\_msualg\_1 ( \\ & k14\_pralg\_2 X0 X1 X2) X1) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge(\neg v11\_struct\_0 \\ & X0)\wedge(l1\_msualg\_1 X0)))\wedge((m1\_subset\_1 X1 (u4\_struct\_0 X0))\wedge( \\ & l3\_msualg\_1 X2 X0))\Rightarrow((v1\_funct\_1 (k5\_msualg\_1 X0 X1 X2))\wedge((v1\_funct\_2 \\ & (k5\_msualg\_1 X0 X1 X2) (k3\_msualg\_1 X0 X1 X2) (k4\_msualg\_1 X0 X1 X2))\wedge \\ & (m1\_subset\_1 (k5\_msualg\_1 X0 X1 X2) (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & (k3\_msualg\_1 X0 X1 X2) (k4\_msualg\_1 X0 X1 X2)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge(\neg v11\_struct\_0 \\ & X0)\wedge(l1\_msualg\_1 X0)))\wedge((m1\_subset\_1 X1 (u4\_struct\_0 X0))\wedge( \\ & l3\_msualg\_1 X2 X0))\Rightarrow(m1\_subset\_1 (k3\_msualg\_1 X0 X1 X2) (k10\_xtuple\_0 \\ & (k6\_finseq\_2 (u1\_struct\_0 X0) (u3\_msualg\_1 X0 X2)))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1\_xboole\_0 X0)\wedge \\ & (((v1\_funct\_1 X2)\wedge((v1\_funct\_2 X2 X0 X1)\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X1))))\wedge(m1\_subset\_1 X3 X0)))\Rightarrow(m1\_subset\_1 ( \\ & k3\_funct\_2 X0 X1 X2 X3) X1) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge(\neg v11\_struct\_0 X0)\wedge \\ & (l1\_msualg\_1 X0)))\wedge(m1\_subset\_1 X1 (u4\_struct\_0 X0))\Rightarrow(m1\_subset\_1 \\ & (k2\_msualg\_1 X0 X1) (u1\_struct\_0 X0)) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X1)\wedge(\neg v11\_struct\_0 \\ & X1)\wedge(l1\_msualg\_1 X1)))\wedge(m1\_pralg\_2 X2 X0 X1)\Rightarrow(l3\_msualg\_1 ( \\ & k14\_pralg\_2 X0 X1 X2) X1) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X1)\wedge(\neg v11\_struct\_0 \\ & X1)\wedge(l1\_msualg\_1 X1)))\wedge(m1\_pralg\_2 X2 X0 X1)\Rightarrow(m2\_pboole (k13\_pralg\_2 \\ & X0 X1 X2) (u4\_struct\_0 X1) (k3\_relat\_1 (u1\_msualg\_1 X1) (k6\_finseq\_2 \\ & (u1\_struct\_0 X1) (k10\_pralg\_2 X0 X1 X2))) (k3\_relat\_1 (u2\_msualg\_1 \\ & X1) (k10\_pralg\_2 X0 X1 X2))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((\neg v2\_struct\_0 X1)\wedge(\neg v11\_struct\_0 X1)\wedge \\ & (l1\_msualg\_1 X1))\Rightarrow(\forall X2.(m1\_pralg\_2 X2 X0 X1)\Rightarrow(k14\_pralg\_2 \\ & X0 X1 X2 = g3\_msualg\_1 X1 (k10\_pralg\_2 X0 X1 X2) (k13\_pralg\_2 X0 X1 \\ & X2))) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1)) \Rightarrow \\
& (\forall X2. (m1\_pralg\_2 X2 X0 X1) \Rightarrow (\forall X3. ((v1\_relat\_1 X3) \wedge \\
& ((v4\_relat\_1 X3 (u1\_struct\_0 X1)) \wedge ((v1\_funct\_1 X3) \wedge (v1\_partfun1 \\
& X3 (u1\_struct\_0 X1)))))) \Rightarrow ((X3 = k10\_pralg\_2 X0 X1 X2) \Leftrightarrow (\forall X4. \\
& (m1\_subset\_1 X4 (u1\_struct\_0 X1)) \Rightarrow (k1\_funct\_1 X3 X4 = k4\_card\_3 \\
& (k9\_pralg\_2 X0 X1 X4 X2))))))
\end{aligned} \tag{16}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \wedge \\
& ((v4\_msualg\_1 X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \Rightarrow (\forall X2. (m1\_subset\_1 \\
& X2 (k10\_xtuple\_0 (k6\_finseq\_2 (u1\_struct\_0 X0) (u3\_msualg\_1 X0 \\
& X1)))) \Rightarrow (\neg v1\_xboole\_0 X2))
\end{aligned} \tag{17}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \wedge \\
& (l3\_msualg\_1 X1 X0)) \Rightarrow ((v3\_msualg\_1 X1 X0) \Rightarrow (X1 = g3\_msualg\_1 X0 \\
& (u3\_msualg\_1 X0 X1) (u4\_msualg\_1 X0 X1)))
\end{aligned} \tag{18}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0. \forall X1. ((\neg v2\_struct\_0 X1) \wedge ((\neg v11\_struct\_0 X1) \wedge \\
& (l1\_msualg\_1 X1))) \Rightarrow (\forall X2. (m1\_pralg\_2 X2 X0 X1) \Rightarrow (\forall X3. \\
& (m1\_subset\_1 X3 (u4\_struct\_0 X1)) \Rightarrow (\forall X4. (m1\_subset\_1 X4 \\
& (k3\_msualg\_1 X1 X3 (k14\_pralg\_2 X0 X1 X2))) \Rightarrow (k3\_funct\_2 (k3\_msualg\_1 \\
& X1 X3 (k14\_pralg\_2 X0 X1 X2)) (k4\_msualg\_1 X1 X3 (k14\_pralg\_2 X0 X1 \\
& X2)) (k5\_msualg\_1 X1 X3 (k14\_pralg\_2 X0 X1 X2)) X4 \in k4\_card\_3 (k9\_pralg\_2 \\
& X0 X1 (k2\_msualg\_1 X1 X3) X2))))))
\end{aligned}$$