

t6_msafree3
(TMPPfjJ4VritdSu2h24dadXMUdX3hesLYMq)

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Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $v1_instal1 : \iota \Rightarrow o$ be given. Let $l1_msualg_1 : \iota \Rightarrow o$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v2_relat_1 : \iota \Rightarrow o$ 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 $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_card_3 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k11_msafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_dtconstr : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_msafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_trees_3 : \iota \Rightarrow \iota$ be given. Let $k1_msaterm : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $k3_tarski : \iota \Rightarrow \iota$ be given. Let $k10_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k8_msafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_dtconstr : \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $m1_trees_3 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $m2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_relat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $v4_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_lang1 : \iota \Rightarrow o$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l1_lang1 : \iota \Rightarrow o$ be given. Let $l3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k10_msafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u4_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v2_relat_1 X1) \wedge ((v4_relat_1 \\ & X1 (u1_struct_0 X0)) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 (u1_struct_0 \\ & X0)))))) \Rightarrow (k3_tarski (k10_xtuple_0 (k8_msafree X0 X1)) = k4_dtconstr \\ & (k5_msafree X0 X1))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((\neg v1_xboole_0 X0) \wedge (((\neg v1_xboole_0 \\ & X1) \wedge (m1_trees_3 X1 X0)) \wedge ((\neg v1_xboole_0 X2) \wedge (m1_subset_1 X2 (\\ & k1_zfmisc_1 X1)))))) \Rightarrow (\forall X3. (m1_dtconstr X3 X0 X1 X2) \Leftrightarrow (m1_subset_1 \\ & X3 X2)) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge(l1_msualg_1 \\
& X0))\wedge(((v1_relat_1 X1)\wedge((v4_relat_1 X1 (u1_struct_0 X0))\wedge((\\
& v1_funct_1 X1)\wedge(v1_partfun1 X1 (u1_struct_0 X0))))))\wedge(m2_pboole \\
& X2 (u4_struct_0 X0) (k3_relat_1 (u1_msualg_1 X0) (k6_finseq_2 \\
& (u1_struct_0 X0) X1)) (k3_relat_1 (u2_msualg_1 X0) X1))))\Rightarrow(\forall X3. \\
& \forall X4.\forall X5.(g3_msualg_1 X0 X1 X2 = g3_msualg_1 X3 X4 X5)\Rightarrow \\
& ((X0 = X3)\wedge((X1 = X4)\wedge(X2 = X5))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\
& (l1_msualg_1 X0)))\wedge((v1_relat_1 X1)\wedge((v2_relat_1 X1)\wedge((v4_relat_1 \\
& X1 (u1_struct_0 X0))\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 (u1_struct_0 \\
& X0))))))\Rightarrow((v3_msualg_1 (k11_msafree X0 X1) X0)\wedge(v4_msualg_1 \\
& (k11_msafree X0 X1) X0))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\
& (l1_msualg_1 X0)))\wedge((v1_relat_1 X1)\wedge((v2_relat_1 X1)\wedge((v4_relat_1 \\
& X1 (u1_struct_0 X0))\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 (u1_struct_0 \\
& X0))))))\Rightarrow((v1_relat_1 (k8_msafree X0 X1))\wedge((v2_relat_1 (k8_msafree \\
& X0 X1))\wedge((v4_relat_1 (k8_msafree X0 X1) (u1_struct_0 X0))\wedge((v1_funct_1 \\
& (k8_msafree X0 X1))\wedge(v1_partfun1 (k8_msafree X0 X1) (u1_struct_0 \\
& X0))))))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\
& (l1_msualg_1 X0)))\wedge((v1_relat_1 X1)\wedge((v4_relat_1 X1 (u1_struct_0 \\
& X0))\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 (u1_struct_0 X0))))))\Rightarrow \\
& ((\neg v2_struct_0 (k5_msafree X0 X1))\wedge(v1_lang1 (k5_msafree X0 X1)))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0)\wedge(l1_struct_0 X0))\Rightarrow(\neg v1_xboole_0 \\
& (u1_struct_0 X0))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\
& (l1_msualg_1 X0)))\wedge((v1_relat_1 X1)\wedge((v2_relat_1 X1)\wedge((v4_relat_1 \\
& X1 (u1_struct_0 X0))\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 (u1_struct_0 \\
& X0))))))\Rightarrow(\neg v1_xboole_0 (k1_msaterm X0 X1))
\end{aligned} \tag{8}$$

Assume the following.

$$\forall X0.(l1_lang1\ X0)\Rightarrow(l1_struct_0\ X0) \quad (9)$$

Assume the following.

$$\forall X0.(¬v1_xboole_0\ X0)\Rightarrow(m1_trees_3\ (k5_trees_3\ X0)\ X0) \quad (10)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((¬v2_struct_0\ X0)\wedge((¬v11_struct_0\ X0)\wedge \\ (l1_msualg_1\ X0)))\wedge((v1_relat_1\ X1)\wedge((v4_relat_1\ X1\ (u1_struct_0 \\ X0))\wedge((v1_funct_1\ X1)\wedge(v1_partfun1\ X1\ (u1_struct_0\ X0))))))\Rightarrow \\ (l1_lang1\ (k5_msafree\ X0\ X1)) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((¬v2_struct_0\ X0)\wedge((¬v11_struct_0\ X0)\wedge \\ (l1_msualg_1\ X0)))\wedge((v1_relat_1\ X1)\wedge((v4_relat_1\ X1\ (u1_struct_0 \\ X0))\wedge((v1_funct_1\ X1)\wedge(v1_partfun1\ X1\ (u1_struct_0\ X0))))))\Rightarrow \\ (m1_subset_1\ (k1_msaterm\ X0\ X1)\ (k1_zfmisc_1\ (k5_trees_3\ (u1_struct_0 \\ (k5_msafree\ X0\ X1)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((¬v2_struct_0\ X0)\wedge((¬v11_struct_0\ X0)\wedge \\ (l1_msualg_1\ X0)))\wedge((v1_relat_1\ X1)\wedge((v2_relat_1\ X1)\wedge((v4_relat_1 \\ X1\ (u1_struct_0\ X0))\wedge((v1_funct_1\ X1)\wedge(v1_partfun1\ X1\ (u1_struct_0 \\ X0))))))\Rightarrow(l3_msualg_1\ (k11_msafree\ X0\ X1)\ X0) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((¬v2_struct_0\ X0)\wedge((¬v11_struct_0\ X0)\wedge \\ (l1_msualg_1\ X0)))\wedge((v1_relat_1\ X1)\wedge((v2_relat_1\ X1)\wedge((v4_relat_1 \\ X1\ (u1_struct_0\ X0))\wedge((v1_funct_1\ X1)\wedge(v1_partfun1\ X1\ (u1_struct_0 \\ X0))))))\Rightarrow(m2_pboole\ (k10_msafree\ X0\ X1)\ (u4_struct_0\ X0)\ (k3_relat_1 \\ (u1_msualg_1\ X0)\ (k6_finseq_2\ (u1_struct_0\ X0)\ (k8_msafree\ X0 \\ X1)))\ (k3_relat_1\ (u2_msualg_1\ X0)\ (k8_msafree\ X0\ X1))) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0.((v1_relat_1\ X0)\wedge(v1_funct_1\ X0))\Rightarrow(k3_card_3\ X0 = k3_tarski\ (k10_xtuple_0\ X0)) \quad (15)$$

Assume the following.

$$\begin{aligned} \forall X0.((¬v2_struct_0\ X0)\wedge((¬v11_struct_0\ X0)\wedge(l1_msualg_1 \\ X0)))\Rightarrow(\forall X1.((v1_relat_1\ X1)\wedge((v4_relat_1\ X1\ (u1_struct_0 \\ X0))\wedge((v1_funct_1\ X1)\wedge(v1_partfun1\ X1\ (u1_struct_0\ X0))))))\Rightarrow \\ (k1_msaterm\ X0\ X1 = k4_dtconstr\ (k5_msafree\ X0\ X1)) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ X0))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v2_relat_1 X1) \wedge ((v4_relat_1 \\ X1 (u1_struct_0 X0)) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 (u1_struct_0 \\ X0)))))) \Rightarrow (k11_msafree X0 X1 = g3_msualg_1 X0 (k8_msafree X0 X1) \\ (k10_msafree X0 X1))) \end{aligned} \quad (17)$$

Assume the following.

$$\forall X0.(l1_msualg_1 X0) \Rightarrow (((v2_struct_0 X0) \wedge (v1_instalg1 \\ X0)) \Rightarrow (v11_struct_0 X0)) \quad (18)$$

Assume the following.

$$\forall X0.(v1_xboole_0 X0) \Rightarrow (\forall X1.(m1_subset_1 X1 (k1_zfmisc_1 \\ X0)) \Rightarrow (v1_xboole_0 X1)) \quad (19)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \wedge \\ (l3_msualg_1 X1 X0)) \Rightarrow ((v3_msualg_1 X1 X0) \Rightarrow (X1 = g3_msualg_1 X0 \\ (u3_msualg_1 X0 X1) (u4_msualg_1 X0 X1))) \end{aligned} \quad (20)$$

Theorem 1

$$\begin{aligned} \forall X0.\forall X1.(((\neg v11_struct_0 X1) \wedge ((v1_instalg1 X1) \wedge \\ (l1_msualg_1 X1))) \Rightarrow (\forall X2.((v1_relat_1 X2) \wedge ((v2_relat_1 \\ X2) \wedge ((v4_relat_1 X2 (u1_struct_0 X1)) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 \\ X2 (u1_struct_0 X1)))))) \Rightarrow ((m1_subset_1 X0 (k3_card_3 (u3_msualg_1 \\ X1 (k11_msafree X1 X2)))) \Leftrightarrow (m1_dtconstr X0 (u1_struct_0 (k5_msafree \\ X1 X2)) (k5_trees_3 (u1_struct_0 (k5_msafree X1 X2)) (k1_msaterm \\ X1 X2)))))) \end{aligned}$$