

t20_msualg_2 (TMZZeS-
rBA33kdTFJSomL5WG4Zyw2K5qU4Kv)

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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 $l3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ 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 $v3_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k9_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $r1_tarski : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k10_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k5_relat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $k2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota$ 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. Let $r1_msualg_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\
& \quad X0))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (\forall X2. \\
& \quad (l3_msualg_1 X2 X0) \Rightarrow (\forall X3. (m3_pboole X3 (u1_struct_0 X0) \\
& \quad (u3_msualg_1 X0 X2)) \Rightarrow (r1_tarski (k10_xtuple_0 (k5_relat_1 (k5_msualg_1 \\
& \quad X0 X1 X2) (k1_funct_1 (k3_relat_1 (u1_msualg_1 X0) (k6_finseq_2 \\
& \quad (u1_struct_0 X0) (k9_msualg_2 X0 X2 X3))) X1))) (k1_funct_1 (k3_relat_1 \\
& \quad (u2_msualg_1 X0) (k9_msualg_2 X0 X2 X3)) X1))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\
& \quad X0))) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (\forall X2. (m3_pboole \\
& \quad X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1)) \Rightarrow (r2_pboole (u1_struct_0 \\
& \quad X0) (k2_pboole (u1_struct_0 X0) (k2_msualg_2 X0 X1) X2) (k9_msualg_2 \\
& \quad X0 X1 X2))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1_relat_1 X1)\wedge((v4_relat_1 X1 X0)\wedge \\ (v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\Rightarrow(\forall X2.((v1_relat_1 \\ X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))\Rightarrow \\ (r2_pboole X0 X1 (k2_pboole X0 X1 X2))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1_relat_1 X1)\wedge((v4_relat_1 X1 X0)\wedge \\ (v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\Rightarrow(\forall X2.((v1_relat_1 \\ X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))\Rightarrow \\ (\forall X3.((v1_relat_1 X3)\wedge((v4_relat_1 X3 X0)\wedge((v1_funct_1 \\ X3)\wedge(v1_partfun1 X3 X0))))\Rightarrow(((r2_pboole X0 X1 X2)\wedge(r2_pboole \\ X0 X2 X3))\Rightarrow(r2_pboole X0 X1 X3)))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((l1_struct_0 X0)\wedge(l2_msualg_1 X1 X0))\Rightarrow \\ ((v1_relat_1 (u3_msualg_1 X0 X1))\wedge((v4_relat_1 (u3_msualg_1 \\ X0 X1) (u1_struct_0 X0))\wedge((v1_funct_1 (u3_msualg_1 X0 X1))\wedge(v1_partfun1 \\ (u3_msualg_1 X0 X1) (u1_struct_0 X0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1_relat_1 X1)\wedge((v4_relat_1 X1 X0)\wedge \\ (v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\Rightarrow(\forall X2.(m3_pboole \\ X2 X0 X1)\Rightarrow((v1_relat_1 X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge \\ (v1_partfun1 X2 X0)))))) \end{aligned} \quad (6)$$

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.

$$\forall X0.(l1_msualg_1 X0)\Rightarrow(l5_struct_0 X0) \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\ X0)\wedge(l1_msualg_1 X0)))\wedge((l3_msualg_1 X1 X0)\wedge(m3_pboole X2 (u1_struct_0 \\ X0) (u3_msualg_1 X0 X1))))\Rightarrow(m3_pboole (k9_msualg_2 X0 X1 X2) (u1_struct_0 \\ X0) (u3_msualg_1 X0 X1)) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((v1_relat_1 X1) \wedge ((v4_relat_1 \\ & X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \wedge ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))) \Rightarrow \\ & ((v1_relat_1 (k2_pboole X0 X1 X2)) \wedge ((v4_relat_1 (k2_pboole X0 \\ & X1 X2) X0) \wedge ((v1_funct_1 (k2_pboole X0 X1 X2)) \wedge (v1_partfun1 (k2_pboole \\ & X0 X1 X2) X0)))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & (l1_msualg_1 X0))) \wedge (l3_msualg_1 X1 X0)) \Rightarrow (m3_pboole (k2_msualg_2 \\ & X0 X1) (u1_struct_0 X0) (u3_msualg_1 X0 X1)) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (\forall X2. (m3_pboole \\ & X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1)) \Rightarrow ((v3_msualg_2 X2 X0 X1) \Leftrightarrow \\ & (\forall X3. (m1_subset_1 X3 (u4_struct_0 X0)) \Rightarrow (r1_msualg_2 X0 \\ & X1 X3 X2)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (\forall X2. (m1_subset_1 \\ & X2 (u4_struct_0 X0)) \Rightarrow (\forall X3. (m3_pboole X3 (u1_struct_0 X0) \\ & (u3_msualg_1 X0 X1)) \Rightarrow ((r1_msualg_2 X0 X1 X2 X3) \Leftrightarrow (r1_tarSKI (k10_xtuple_0 \\ & (k5_relat_1 (k5_msualg_1 X0 X2 X1) (k1_funct_1 (k3_relat_1 (u1_msualg_1 \\ & X0) (k6_finseq_2 (u1_struct_0 X0) X3)) X2))) (k1_funct_1 (k3_relat_1 \\ & (u2_msualg_1 X0) X3) X2)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((v1_relat_1 X1) \wedge ((v4_relat_1 \\ & X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \wedge ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))) \Rightarrow \\ & (k2_pboole X0 X1 X2 = k2_pboole X0 X2 X1) \end{aligned} \quad (15)$$

Theorem 1

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & X0))) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (\forall X2. (m3_pboole \\ & X2 (u1_struct_0 X0) (u3_msualg_1 X0 X1)) \Rightarrow ((v3_msualg_2 (k9_msualg_2 \\ & X0 X1 X2) X0 X1) \wedge (r2_pboole (u1_struct_0 X0) X2 (k9_msualg_2 X0 X1 \\ & X2)))))) \end{aligned}$$