

t15_extens_1

(TMXcdDzBr2YpeDzpnkf7r1fBV8xGj6bsmZC)

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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 $m2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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 $v2_relat_1 : \iota \Rightarrow o$ be given. Let $v2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r6_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $k8_pboole : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $r1_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge (\\
 & \quad (v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \Rightarrow (\forall X2. ((v1_relat_1 \\
 & \quad X2) \wedge ((v2_relat_1 X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (\\
 & \quad v1_partfun1 X2 X0)))))) \Rightarrow (\forall X3. (m2_pboole X3 X0 X1 X2) \Rightarrow ((v2_msualg_3 \\
 & \quad X3 X0 X1 X2) \Leftrightarrow (\forall X4. ((v1_relat_1 X4) \wedge ((v2_relat_1 X4) \wedge (\\
 & \quad v4_relat_1 X4 X0) \wedge ((v1_funct_1 X4) \wedge (v1_partfun1 X4 X0)))))) \Rightarrow (\\
 & \quad \forall X5. (m2_pboole X5 X0 X2 X4) \Rightarrow (\forall X6. (m2_pboole X6 X0 \\
 & \quad X2 X4) \Rightarrow ((r6_pboole X0 (k3_msualg_3 X0 X1 X2 X4 X3 X5) (k3_msualg_3 \\
 & \quad X0 X1 X2 X4 X3 X6)) \Rightarrow (r6_pboole X0 X5 X6))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0. \forall X1. \forall X2. ((\neg v1_xboole_0 X0) \wedge (((v1_relat_1 \\
 & \quad X1) \wedge ((v4_relat_1 X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \wedge \\
 & \quad ((v1_relat_1 X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 \\
 & \quad X2 X0)))))) \Rightarrow ((r8_pboole X0 X1 X2) \Leftrightarrow (X1 = X2))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1_relat_1 X1)\wedge((v4_relat_1 \\ & X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge((v1_relat_1 \\ & X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))\Rightarrow \\ & ((r6_pboole X0 X1 X2)\Leftrightarrow(X1 = X2)) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & (((v1_relat_1 X1)\wedge((v4_relat_1 X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 \\ & X1 X0))))\wedge(((v1_relat_1 X2)\wedge((v2_relat_1 X2)\wedge((v4_relat_1 X2 \\ & X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))))\wedge(((v1_relat_1 \\ & X3)\wedge((v2_relat_1 X3)\wedge((v4_relat_1 X3 X0)\wedge((v1_funct_1 X3)\wedge(\\ & v1_partfun1 X3 X0))))))\wedge((m2_pboole X4 X0 X1 X2)\wedge(m2_pboole X5 X0 \\ & X2 X3))))\Rightarrow(k3_msualg_3 X0 X1 X2 X3 X4 X5 = k8_pboole X4 X5) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(l1_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u1_struct_0 X0)) \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((l1_struct_0 X0)\wedge((v4_msualg_1 X1 X0)\wedge \\ & (l2_msualg_1 X1 X0)))\Rightarrow((v1_relat_1 (u3_msualg_1 X0 X1))\wedge((v2_relat_1 \\ & (u3_msualg_1 X0 X1))\wedge((v4_relat_1 (u3_msualg_1 X0 X1) (u1_struct_0 \\ & X0))\wedge((v1_funct_1 (u3_msualg_1 X0 X1))\wedge(v1_partfun1 (u3_msualg_1 \\ & X0 X1) (u1_struct_0 X0)))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((l1_struct_0 X0)\wedge(l2_msualg_1 X1 X0))\Rightarrow \\ & ((v1_relat_1 (u3_msualg_1 X0 X1))\wedge((v4_relat_1 (u3_msualg_1 \\ & X0 X1) (u1_struct_0 X0))\wedge((v1_funct_1 (u3_msualg_1 X0 X1))\wedge(v1_partfun1 \\ & (u3_msualg_1 X0 X1) (u1_struct_0 X0)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1_relat_1 X1)\wedge((v4_relat_1 \\ & X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge((v1_relat_1 \\ & X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))\Rightarrow \\ & (\forall X3.(m2_pboole X3 X0 X1 X2)\Rightarrow((v1_relat_1 X3)\wedge((v4_relat_1 \\ & X3 X0)\wedge((v1_funct_1 X3)\wedge(v1_partfun1 X3 X0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\forall X0.(l5_struct_0 X0)\Rightarrow(l1_struct_0 X0) \quad (9)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \Rightarrow (\forall X1. (l3_msualg_1 X1 X0) \Rightarrow (l2_msualg_1 X1 X0)) \quad (10)$$

Assume the following.

$$\forall X0.(l1_msualg_1 X0) \Rightarrow (l5_struct_0 X0) \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & (((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 \\ & \quad X1 X0)))) \wedge (((v1_relat_1 X2) \wedge ((v2_relat_1 X2) \wedge ((v4_relat_1 X2 \\ & \quad X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))))) \wedge (((v1_relat_1 \\ & \quad X3) \wedge ((v2_relat_1 X3) \wedge ((v4_relat_1 X3 X0) \wedge ((v1_funct_1 X3) \wedge (\\ & \quad v1_partfun1 X3 X0)))))) \wedge ((m2_pboole X4 X0 X1 X2) \wedge (m2_pboole X5 X0 \\ & \quad X2 X3)))) \Rightarrow (m2_pboole (k3_msualg_3 X0 X1 X2 X3 X4 X5) X0 X1 X3) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.(l3_msualg_1 X1 X0) \Rightarrow (\forall X2.(l3_msualg_1 \\ & \quad X2 X0) \Rightarrow (\forall X3.(m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 \\ & \quad X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow ((r2_msualg_3 X0 X1 X2 X3) \Leftrightarrow ((r1_msualg_3 \\ & \quad X0 X1 X2 X3) \wedge (v2_msualg_3 X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) \\ & \quad (u3_msualg_1 X0 X2))))))) \end{aligned} \quad (13)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ & \quad X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\ & \quad (\forall X2.((v4_msualg_1 X2 X0) \wedge (l3_msualg_1 X2 X0)) \Rightarrow (\forall X3. \\ & \quad (m2_pboole X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 \\ & \quad X0 X2)) \Rightarrow ((r2_msualg_3 X0 X1 X2 X3) \Rightarrow (\forall X4.((v4_msualg_1 X4 \\ & \quad X0) \wedge (l3_msualg_1 X4 X0)) \Rightarrow (\forall X5.(m2_pboole X5 (u1_struct_0 \\ & \quad X0) (u3_msualg_1 X0 X2) (u3_msualg_1 X0 X4)) \Rightarrow (\forall X6.(m2_pboole \\ & \quad X6 (u1_struct_0 X0) (u3_msualg_1 X0 X2) (u3_msualg_1 X0 X4)) \Rightarrow ((\\ & \quad r8_pboole (u1_struct_0 X0) (k3_msualg_3 (u1_struct_0 X0) (u3_msualg_1 \\ & \quad X0 X1) (u3_msualg_1 X0 X2) (u3_msualg_1 X0 X4) X3 X5) (k3_msualg_3 \\ & \quad (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2) (u3_msualg_1 \\ & \quad X0 X4) X3 X6)) \Rightarrow (r8_pboole (u1_struct_0 X0) X5 X6)))))))))) \end{aligned}$$