

t9_closure1

(TMSi5dXqB68bpdY4aPUcyHt8Lb3L5KtKVzj)

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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 $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_closure1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r6_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v2_relat_1 X1) \wedge ((v4_relat_1 \\ & X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))))) \Rightarrow (\forall X2. \\ (m1_pboole X2 X0 X1) \Rightarrow (r6_pboole X0 X2 (k1_closure1 X0 X1 X1 (k2_msualg_3 \\ X0 X1) X2))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((v1_relat_1 X1) \wedge ((v4_relat_1 \\ X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \wedge ((v1_relat_1 \\ X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))))) \Rightarrow \\ & ((r6_pboole X0 X1 X2) \Leftrightarrow (X1 = X2)) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge \\ & (v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \Rightarrow (\forall X2. (m1_pboole \\ X2 X0 X1) \Rightarrow ((v1_relat_1 X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge \\ & (v1_partfun1 X2 X0)))))) \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge \\ & (v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \Rightarrow (m2_pboole (k2_msualg_3 \\ X0 X1) X0 X1 X1) \end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((v1_relat_1 \\
& X1)\wedge((v2_relat_1 X1)\wedge((v4_relat_1 X1 X0)\wedge((v1_funct_1 X1)\wedge \\
& v1_partfun1 X1 X0))))\wedge(((v1_relat_1 X2)\wedge((v2_relat_1 X2)\wedge \\
& (v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))\wedge \\
& ((m2_pboole X3 X0 X1 X2)\wedge(m1_pboole X4 X0 X1)))\Rightarrow(m1_pboole (k1_closure1 \\
& X0 X1 X2 X3 X4) X0 X2)
\end{aligned}
\tag{5}$$

Theorem 1

$$\begin{aligned}
& \forall X0.\forall X1.((v1_relat_1 X1)\wedge((v2_relat_1 X1)\wedge((v4_relat_1 \\
& X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\Rightarrow(\forall X2. \\
& (m1_pboole X2 X0 X1)\Rightarrow(\forall X3.(m1_pboole X3 X0 X1)\Rightarrow((r2_pboole \\
& X0 X2 X3)\Rightarrow(r2_pboole X0 (k1_closure1 X0 X1 X1 (k2_msualg_3 X0 X1) \\
& X2) (k1_closure1 X0 X1 X1 (k2_msualg_3 X0 X1) X3))))))
\end{aligned}$$