

t1_msafree3 (TMbXAfZVuKic- qTCWP9ZSSc1Qx1wfANEhJmA)

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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 $v1_funcop_1 : \iota \Rightarrow o$ be given. Let $v1_msualg_3 : \iota \Rightarrow o$ be given. Let $r2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_funct_6 : \iota \Rightarrow \iota$ be given. Let $r6_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_equation : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1_tarski : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k9_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $v2_funct_1 : \iota \Rightarrow o$ be given. Let $k8_relat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_relat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_funct_6 : \iota \Rightarrow \iota$ be given. Let $k10_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k1_relset_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0. \forall X1. ((v1_relat_1 X1) \wedge (v1_funct_1 X1)) \Rightarrow (((r1_tarski X0 (k9_xtuple_0 X1)) \wedge (v2_funct_1 X1)) \Rightarrow (k8_relat_1 X1 (k7_relat_1 X1 X0) = X0)) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \Rightarrow (\forall X2. ((v1_relat_1 X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))) \Rightarrow ((\forall X3. (X3 \in X0) \Rightarrow (k1_funct_1 X1 X3 = k1_funct_1 X2 X3)) \Rightarrow (X1 = X2))) \quad (2)$$

Assume the following.

$$\forall X0. \forall X1. ((v1_relat_1 X1) \wedge (v1_funct_1 X1)) \Rightarrow (\forall X2. ((v1_relat_1 X2) \wedge (v1_funct_1 X2)) \Rightarrow (((X0 \in k9_xtuple_0 X1) \wedge (X2 = k1_funct_1 X1 X0)) \Rightarrow ((X0 \in k9_xtuple_0 (k2_funct_6 X1)) \wedge ((k1_funct_1 (k2_funct_6 X1) X0 = k9_xtuple_0 X2) \wedge ((X0 \in k9_xtuple_0 (k3_funct_6 X1)) \wedge (k1_funct_1 (k3_funct_6 X1) X0 = k10_xtuple_0 X2)))))) \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((v1_relat_1 X1)\wedge((v4_relat_1 \\ X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge((v1_relat_1 \\ X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))))\Rightarrow \\ ((r6_pboole X0 X1 X2)\Leftrightarrow(X1 = X2)) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0.\forall X1.((v1_relat_1 X1)\wedge(v4_relat_1 X1 X0))\Rightarrow(\\ k1_relset_1 X0 X1 = k9_xtuple_0 X1) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.((v1_relat_1 X0)\wedge((v1_funct_1 X0)\wedge(v1_funcop_1 \\ X0)))\Rightarrow((v1_relat_1 (k1_funct_1 X0 X1))\wedge(v1_funct_1 (k1_funct_1 \\ X0 X1))) \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1_relat_1 X1)\wedge((v4_relat_1 X1 X0)\wedge(\\ (v1_funct_1 X1)\wedge((v1_partfun1 X1 X0)\wedge(v1_funcop_1 X1))))))\Rightarrow(\\ (v1_relat_1 (k2_funct_6 X1))\wedge((v4_relat_1 (k2_funct_6 X1) X0)\wedge \\ ((v1_funct_1 (k2_funct_6 X1))\wedge(v1_partfun1 (k2_funct_6 X1) X0)))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1_relat_1 X1)\wedge((v4_relat_1 X1 X0)\wedge(\\ (v1_funct_1 X1)\wedge((v1_partfun1 X1 X0)\wedge(v1_funcop_1 X1))))))\Rightarrow(\\ (v1_relat_1 (k2_funct_6 X1))\wedge((v4_relat_1 (k2_funct_6 X1) X0)\wedge \\ (v1_funct_1 (k2_funct_6 X1)))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((v1_relat_1 X1)\wedge((v4_relat_1 \\ X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge((v1_relat_1 \\ X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge((v1_partfun1 X2 X0)\wedge \\ (v1_funcop_1 X2))))))\Rightarrow((v1_relat_1 (k9_pboole X0 X1 X2))\wedge((v4_relat_1 \\ (k9_pboole X0 X1 X2) X0)\wedge((v1_funct_1 (k9_pboole X0 X1 X2))\wedge(v1_partfun1 \\ (k9_pboole X0 X1 X2) X0)))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((v1_relat_1 X1)\wedge((v4_relat_1 \\ X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge((v1_relat_1 \\ X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge((v1_partfun1 X2 X0)\wedge \\ (v1_funcop_1 X2))))))\Rightarrow((v1_relat_1 (k1_equation X0 X1 X2))\wedge(\\ (v4_relat_1 (k1_equation X0 X1 X2) X0)\wedge((v1_funct_1 (k1_equation \\ X0 X1 X2))\wedge(v1_partfun1 (k1_equation X0 X1 X2) X0)))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge \\ & (v1_funct_1 X1) \wedge (v1_partfun1 X1 X0))) \Rightarrow (\forall X2. ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))) \Rightarrow \\ & ((r2_pboole X0 X1 X2) \Leftrightarrow (\forall X3. (X3 \in X0) \Rightarrow (r1_tarski (k1_funct_1 \\ & X1 X3) (k1_funct_1 X2 X3)))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge (v4_relat_1 X1 X0)) \Rightarrow (\\ & (v1_partfun1 X1 X0) \Leftrightarrow (k1_relset_1 X0 X1 = X0)) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((v1_relat_1 X0) \wedge (v1_funct_1 X0)) \Rightarrow ((v1_msualg_3 \\ & X0) \Leftrightarrow (\forall X1. \forall X2. ((v1_relat_1 X2) \wedge (v1_funct_1 X2)) \Rightarrow \\ & ((X1 \in k9_xtuple_0 X0) \wedge (k1_funct_1 X0 X1 = X2)) \Rightarrow (v2_funct_1 X2))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge (\\ & (v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \Rightarrow (\forall X2. ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge ((v1_partfun1 X2 X0) \wedge \\ & (v1_funcop_1 X2)))))) \Rightarrow (\forall X3. ((v1_relat_1 X3) \wedge ((v4_relat_1 \\ & X3 X0) \wedge ((v1_funct_1 X3) \wedge (v1_partfun1 X3 X0)))) \Rightarrow ((X3 = k9_pboole \\ & X0 X1 X2) \Leftrightarrow (\forall X4. (X4 \in X0) \Rightarrow (k1_funct_1 X3 X4 = k7_relat_1 (k1_funct_1 \\ & X2 X4) (k1_funct_1 X1 X4)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge (\\ & (v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \Rightarrow (\forall X2. ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge ((v1_partfun1 X2 X0) \wedge \\ & (v1_funcop_1 X2)))))) \Rightarrow (\forall X3. ((v1_relat_1 X3) \wedge ((v4_relat_1 \\ & X3 X0) \wedge ((v1_funct_1 X3) \wedge (v1_partfun1 X3 X0)))) \Rightarrow ((X3 = k1_equation \\ & X0 X1 X2) \Leftrightarrow (\forall X4. (X4 \in X0) \Rightarrow (k1_funct_1 X3 X4 = k8_relat_1 (k1_funct_1 \\ & X2 X4) (k1_funct_1 X1 X4)))))) \end{aligned} \quad (15)$$

Theorem 1

$$\begin{aligned} & \forall X0. \forall X1. ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge (\\ & (v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \Rightarrow (\forall X2. ((v1_relat_1 \\ & X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge ((v1_partfun1 X2 X0) \wedge \\ & (v1_funcop_1 X2)))))) \Rightarrow (((v1_msualg_3 X2) \wedge (r2_pboole X0 X1 (k2_funct_6 \\ & X2))) \Rightarrow (r6_pboole X0 (k1_equation X0 (k9_pboole X0 X1 X2) X2) X1))) \end{aligned}$$