

l15_waybel_5
(TMK8nf5UzAf97db7k1p1XVJGSDDn57Ufgw1)

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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 $m2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k7_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_relset_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_card_3 : \iota \Rightarrow \iota$ be given. Let $k2_funct_6 : \iota \Rightarrow \iota$ be given. Let $k2_pralg_2 : \iota \Rightarrow \iota$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k10_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $v1_funcop_1 : \iota \Rightarrow o$ be given. Let $k9_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k2_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((v1_relat_1 X0) \wedge ((v1_funct_1 X0) \wedge (v1_funcop_1 X0))) \Rightarrow \\ & (\forall X1.((v1_relat_1 X1) \wedge (v1_funct_1 X1)) \Rightarrow ((X1 \in k1_relset_1 \\ & (k4_card_3 (k2_funct_6 X0)) (k2_pralg_2 X0)) \Rightarrow (\forall X2.(X2 \in \\ & k9_xtuple_0 X0) \Rightarrow ((k1_funct_1 X1 X2 \in k9_xtuple_0 (k1_funct_1 X0 \\ & X2)) \wedge ((k1_funct_1 (k1_funct_1 (k2_pralg_2 X0) X1) X2 = k1_funct_1 \\ & (k1_funct_1 X0 X2) (k1_funct_1 X1 X2)) \wedge (k1_funct_1 (k1_funct_1 \\ & X0 X2) (k1_funct_1 X1 X2) \in k10_xtuple_0 (k1_funct_1 (k2_pralg_2 \\ & X0) X1)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\forall X0. \forall X1. k7_funcop_1 X0 X1 = k2_funcop_1 X0 X1 \tag{2}$$

Assume the following.

$$\forall X0. \forall X1. ((v1_relat_1 X1) \wedge (v4_relat_1 X1 X0)) \Rightarrow (k1_relset_1 X0 X1 = k9_xtuple_0 X1) \tag{3}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (v1_relat_1 (k2_funcop_1 X0 X1)) \wedge ((v4_relat_1 \\ & (k2_funcop_1 X0 X1) X0) \wedge ((v1_funct_1 (k2_funcop_1 X0 X1)) \wedge (v1_partfun1 \\ & (k2_funcop_1 X0 X1) X0))) \end{aligned} \tag{4}$$

Assume the following.

$$\forall X0. \forall X1. (v1_relat_1 (k2_funcop_1 X0 X1)) \wedge (v1_funct_1 (k2_funcop_1 X0 X1)) \tag{5}$$

Assume the following.

$$\forall X0.\forall X1.v4_relat_1 (k2_funcop_1 X0 X1) X0 \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1_relat_1 X1)\wedge((v4_relat_1 \\ & X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge((v1_relat_1 \\ & X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))))\Rightarrow \\ & (\forall X3.(m2_pboole X3 X0 X1 X2)\Rightarrow((v1_relat_1 X3)\wedge((v4_relat_1 \\ & X3 X0)\wedge((v1_funct_1 X3)\wedge(v1_partfun1 X3 X0)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0.\forall X1.((v1_relat_1 X1)\wedge(v4_relat_1 X1 X0))\Rightarrow(\\ (v1_partfun1 X1 X0)\Leftrightarrow(k1_relset_1 X0 X1 = X0)) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1_relat_1 X1)\wedge((v4_relat_1 \\ & X1 X0)\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 X0))))\wedge((v1_relat_1 \\ & X2)\wedge((v4_relat_1 X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))))\Rightarrow \\ & (\forall X3.(m2_pboole X3 X0 X1 X2)\Rightarrow(v1_funcop_1 X3)) \end{aligned} \quad (9)$$

Theorem 1

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((v1_relat_1 X2)\wedge((v4_relat_1 \\ & X2 X0)\wedge((v1_funct_1 X2)\wedge(v1_partfun1 X2 X0))))\Rightarrow(\forall X3.(\\ & m2_pboole X3 X0 X2 (k7_funcop_1 X0 X1))\Rightarrow(\forall X4.((v1_relat_1 \\ & X4)\wedge(v1_funct_1 X4))\Rightarrow((X4 \in k1_relset_1 (k4_card_3 (k2_funct_6 \\ & X3)) (k2_pralg_2 X3))\Rightarrow(\forall X5.(X5 \in X0)\Rightarrow((k1_funct_1 (k1_funct_1 \\ & (k2_pralg_2 X3) X4) X5 = k1_funct_1 (k1_funct_1 X3 X5) (k1_funct_1 \\ & X4 X5))\wedge(k1_funct_1 (k1_funct_1 X3 X5) (k1_funct_1 X4 X5) \in k10_xtuple_0 \\ & (k1_funct_1 (k2_pralg_2 X3) X4)))))) \end{aligned}$$