

t16_cat_3 (TMKYiyedGAspqKM- rhkpuiUtErnLc8MRwKTN)

October 27, 2020

Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $v2_cat_1 : \iota \Rightarrow o$ be given. Let $v3_cat_1 : \iota \Rightarrow o$ be given. Let $v4_cat_1 : \iota \Rightarrow o$ be given. Let $v5_cat_1 : \iota \Rightarrow o$ be given. Let $v6_cat_1 : \iota \Rightarrow o$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r2_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k2_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $k7_partfun1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ be given. Let $k2_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l5_struct_0 : \iota \Rightarrow o$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v5_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (\neg v1_xboole_0 X2) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 X2) \Rightarrow ((X1 \in X0) \Rightarrow (k7_partfun1 X2 (k8_funcop_1 X2 \\ & X0 X3) X1 = X3))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u4_struct_0 \\ & X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 \\ & X0 X2 = k4_graph_1 X0 X1) \Rightarrow ((k3_graph_1 X0 (k1_cat_1 X0 X1 X2) = k3_graph_1 \\ & X0 X1) \wedge (k4_graph_1 X0 (k1_cat_1 X0 X1 X2) = k4_graph_1 X0 X2)))))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((v1_funct_1 X2)\wedge \\ & ((v1_funct_2 X2 X0 X1)\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\ & X0 X1)))))\wedge((v1_funct_1 X3)\wedge((v1_funct_2 X3 X0 X1)\wedge(m1_subset_1 \\ & X3 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1))))))\Rightarrow((r2_funct_2 X0 X1 X2 \\ & X3)\Leftrightarrow(X2 = X3)) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1_xboole_0 X0)\wedge(m1_subset_1 X2 X0))\Rightarrow(k8_funcop_1 X0 X1 X2 = k2_funcop_1 X1 X2) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\ & (l1_graph_1 X0)))\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(k4_graph_1 \\ & X0 X1 = k2_graph_1 X0 X1) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\ & (l1_graph_1 X0)))\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(k3_graph_1 \\ & X0 X1 = k1_graph_1 X0 X1) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(l1_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u1_struct_0 X0)) \quad (7)$$

Assume the following.

$$\forall X0.(l5_struct_0 X0)\Rightarrow(l1_struct_0 X0) \quad (8)$$

Assume the following.

$$\forall X0.(l1_graph_1 X0)\Rightarrow(l5_struct_0 X0) \quad (9)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0)\Rightarrow(l1_graph_1 X0) \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((\neg v1_xboole_0 X0)\wedge(m1_subset_1 \\ & X2 X0))\Rightarrow(((v1_funct_1 (k8_funcop_1 X0 X1 X2))\wedge((v1_funct_2 (k8_funcop_1 \\ & X0 X1 X2) X1 X0)\wedge(m1_subset_1 (k8_funcop_1 X0 X1 X2) (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 X0)))))) \end{aligned} \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((v1_relat_1 X1)\wedge((v5_relat_1 X1 X0)\wedge(v1_funct_1 X1)))\Rightarrow(m1_subset_1 (k7_partfun1 X0 X1 X2) X0) \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge(((v1_funct_1 X2)\wedge((v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 (u4_struct_0 X0))))))\wedge(m1_subset_1 X3 (u4_struct_0 X0)))\Rightarrow((v1_funct_1 (k6_cat_3 X0 X1 X2 X3))\wedge((v1_funct_2 (k6_cat_3 X0 X1 X2 X3) X1 (u4_struct_0 X0))\wedge(m1_subset_1 (k6_cat_3 X0 X1 X2 X3) (k1_zfmisc_1 (k2_zfmisc_1 X1 (u4_struct_0 X0)))))) \quad (13) \end{aligned}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_graph_1 X0)))\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(m1_subset_1 (k4_graph_1 X0 X1) (u1_struct_0 X0)) \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge((v1_funct_1 X2)\wedge((v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 (u4_struct_0 X0))))))\Rightarrow((v1_funct_1 (k3_cat_3 X0 X1 X2))\wedge((v1_funct_2 (k3_cat_3 X0 X1 X2) X1 (u1_struct_0 X0))\wedge(m1_subset_1 (k3_cat_3 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 X1 (u1_struct_0 X0)))))) \quad (15) \end{aligned}$$

Assume the following.

$$\forall X0.\forall X1.((l1_graph_1 X0)\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(m1_subset_1 (k2_graph_1 X0 X1) (u1_struct_0 X0)) \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge((v1_funct_1 X2)\wedge((v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 (u4_struct_0 X0))))))\Rightarrow((v1_funct_1 (k2_cat_3 X0 X1 X2))\wedge((v1_funct_2 (k2_cat_3 X0 X1 X2) X1 (u1_struct_0 X0))\wedge(m1_subset_1 (k2_cat_3 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 X1 (u1_struct_0 X0)))))) \quad (17) \end{aligned}$$

Assume the following.

$$\forall X0.\forall X1.((l1_graph_1 X0)\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(m1_subset_1 (k1_graph_1 X0 X1) (u1_struct_0 X0)) \quad (18)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.\forall X2.((v1_funct_1 \\ & X2)\wedge((v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 (u4_struct_0 X0))))))\Rightarrow(\forall X3.(m1_subset_1 \\ & X3 (u4_struct_0 X0))\Rightarrow(\forall X4.((v1_funct_1 X4)\wedge((v1_funct_2 \\ & X4 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 \\ & X1 (u4_struct_0 X0))))))\Rightarrow((X4 = k6_cat_3 X0 X1 X2 X3)\Leftrightarrow(\forall X5. \\ & (X5 \in X1)\Rightarrow(k7_partfun1 (u4_struct_0 X0) X4 X5 = k1_cat_1 X0 X3 (k7_partfun1 \\ & (u4_struct_0 X0) X2 X5)))))) \end{aligned} \quad (19)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.\forall X2.((v1_funct_1 \\ & X2)\wedge((v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 (u4_struct_0 X0))))))\Rightarrow(\forall X3.((v1_funct_1 \\ & X3)\wedge((v1_funct_2 X3 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X3 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 (u1_struct_0 X0))))))\Rightarrow((X3 = k3_cat_3 X0 X1 X2)\Leftrightarrow \\ & (\forall X4.(X4 \in X1)\Rightarrow(k7_partfun1 (u1_struct_0 X0) X3 X4 = k4_graph_1 \\ & X0 (k7_partfun1 (u4_struct_0 X0) X2 X4)))))) \end{aligned} \quad (20)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.\forall X2.((v1_funct_1 \\ & X2)\wedge((v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 (u4_struct_0 X0))))))\Rightarrow(\forall X3.((v1_funct_1 \\ & X3)\wedge((v1_funct_2 X3 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X3 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 (u1_struct_0 X0))))))\Rightarrow((X3 = k2_cat_3 X0 X1 X2)\Leftrightarrow \\ & (\forall X4.(X4 \in X1)\Rightarrow(k7_partfun1 (u1_struct_0 X0) X3 X4 = k3_graph_1 \\ & X0 (k7_partfun1 (u4_struct_0 X0) X2 X4)))))) \end{aligned} \quad (21)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))\Rightarrow((v4_relat_1 X2 X0)\wedge(v5_relat_1 X2 X1)) \quad (22)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))\Rightarrow(v1_relat_1 X2) \quad (23)$$

Theorem 1

$$\begin{aligned} & \forall X0. \forall X1. ((\neg v2_struct_0 X1) \wedge ((\neg v11_struct_0 X1) \wedge \\ & ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 X1) \wedge ((v5_cat_1 X1) \wedge \\ & ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))))) \Rightarrow (\forall X2. (m1_subset_1 \\ & X2 (u4_struct_0 X1)) \Rightarrow (\forall X3. ((v1_funct_1 X3) \wedge ((v1_funct_2 \\ & X3 X0 (u4_struct_0 X1)) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 \\ & X0 (u4_struct_0 X1)))))) \Rightarrow ((r2_funct_2 X0 (u1_struct_0 X1) (k2_cat_3 \\ & X1 X0 X3) (k8_funcop_1 (u1_struct_0 X1) X0 (k4_graph_1 X1 X2))) \Rightarrow \\ & ((r2_funct_2 X0 (u1_struct_0 X1) (k2_cat_3 X1 X0 (k6_cat_3 X1 X0 \\ & X3 X2)) (k8_funcop_1 (u1_struct_0 X1) X0 (k3_graph_1 X1 X2))) \wedge \\ & (r2_funct_2 X0 (u1_struct_0 X1) (k3_cat_3 X1 X0 (k6_cat_3 X1 X0 X3 \\ & X2)) (k3_cat_3 X1 X0 X3)))))) \end{aligned}$$