

t43_cat_3 (TMMtX-
iBGLb4Y9NzqmGUjWiYURJnLpSpLYNs)

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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 $u1_struct.0 : \iota \Rightarrow \iota$ be given. Let $u4_struct.0 : \iota \Rightarrow \iota$ be given. Let $k3_graph.1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_cat.3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_cat.3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_tarski : \iota \Rightarrow \iota$ be given. Let $v1_xboole.0 : \iota \Rightarrow o$ be given. Let $k7_partfun1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_funcop.1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $r2_funct.2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_funcop.1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_funcop.1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k16_funcop.1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_struct.0 : \iota \Rightarrow o$ be given. Let $l5_struct.0 : \iota \Rightarrow o$ be given. Let $l1_graph.1 : \iota \Rightarrow o$ be given. Let $k2_cat.3 : \iota \Rightarrow \iota \Rightarrow \iota$ 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.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((v1_funct.1 X2) \wedge \\ & ((v1_funct.2 X2 X0 X1) \wedge (m1_subset.1 X2 (k1_zfmisc.1 (k2_zfmisc.1 \\ & X0 X1)))))) \wedge ((v1_funct.1 X3) \wedge ((v1_funct.2 X3 X0 X1) \wedge (m1_subset.1 \\ & X3 (k1_zfmisc.1 (k2_zfmisc.1 X0 X1)))))) \Rightarrow ((r2_funct.2 X0 X1 X2 \\ & X3) \Leftrightarrow (X2 = X3)) \end{aligned} \tag{2}$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. ((\neg v1_xboole.0 X0) \wedge (m1_subset.1 X2 X0)) \Rightarrow (k8_funcop.1 X0 X1 X2 = k2_funcop.1 X1 X2) \tag{3}$$

Assume the following.

$$\forall X0. \forall X1. k7_funcop.1 X0 X1 = k2_funcop.1 X0 X1 \tag{4}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1_xboole_0 X0)\wedge(m1_subset_1 X2 X0))\Rightarrow(k1_cat_3 X0 X1 X2 = k16_funcop_1 X1 X2) \quad (5)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(l1_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u1_struct_0 X0)) \quad (6)$$

Assume the following.

$$\forall X0.((\neg v11_struct_0 X0)\wedge(l5_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u4_struct_0 X0)) \quad (7)$$

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.

$$\forall X0.\forall X1.\forall X2.((\neg v1_xboole_0 X0)\wedge(m1_subset_1 X2 X0))\Rightarrow((v1_funct_1 (k8_funcop_1 X0 X1 X2))\wedge((v1_funct_2 (k8_funcop_1 X0 X1 X2) X1 X0)\wedge(m1_subset_1 (k8_funcop_1 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge((v1_funct_1 X2)\wedge((v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 (u4_struct_0 X0)))))))\Rightarrow((v1_funct_1 (k2_cat_3 X0 X1 X2))\wedge((v1_funct_2 (k2_cat_3 X0 X1 X2) X1 (u1_struct_0 X0))\wedge(m1_subset_1 (k2_cat_3 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 X1 (u1_struct_0 X0)))))) \quad (12)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1_xboole_0 X0)\wedge(m1_subset_1 X2 X0))\Rightarrow((v1_funct_1 (k1_cat_3 X0 X1 X2))\wedge((v1_funct_2 (k1_cat_3 X0 X1 X2) (k1_tarSKI X1) X0)\wedge(m1_subset_1 (k1_cat_3 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 (k1_tarSKI X1) X0)))))) \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.k16_funcop_1 X0 X1 = k7_funcop_1 (k1_tarski X0) X1 \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.\forall X2.((v1_funct_1 \\ & X2) \wedge ((v1_funct_2 X2 X1 (u4_struct_0 X0)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 (u4_struct_0 X0)))))) \Rightarrow (\forall X3.((v1_funct_1 \\ & X3) \wedge ((v1_funct_2 X3 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X3 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 (u1_struct_0 X0)))))) \Rightarrow ((X3 = k2_cat_3 X0 X1 X2) \Leftrightarrow \\ & (\forall X4.(X4 \in X1) \Rightarrow (k7_partfun1 (u1_struct_0 X0) X3 X4 = k3_graph_1 \\ & X0 (k7_partfun1 (u4_struct_0 X0) X2 X4)))))) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.\forall X3.((v1_funct_1 X3) \wedge ((v1_funct_2 X3 \\ & X2 (u4_struct_0 X0)) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 \\ & X2 (u4_struct_0 X0)))))) \Rightarrow ((m1_cat_3 X3 X0 X1 X2) \Leftrightarrow (r2_funct_2 X2 \\ & (u1_struct_0 X0) (k2_cat_3 X0 X2 X3) (k8_funcop_1 (u1_struct_0 \\ & X0) X2 X1)))))) \end{aligned} \quad (16)$$

Theorem 1

$$\begin{aligned} & \forall X0.\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg v11_struct_0 X1) \wedge \\ & ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 X1) \wedge ((v5_cat_1 X1) \wedge \\ & ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2.(m1_subset_1 \\ & X2 (u1_struct_0 X1)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u4_struct_0 \\ & X1)) \Rightarrow ((k3_graph_1 X1 X3 = X2) \Rightarrow (m1_cat_3 (k1_cat_3 (u4_struct_0 \\ & X1) X0 X3) X1 X2 (k1_tarski X0)))))) \end{aligned}$$