

t11_cat_2

(TMGdVrRX6k7c2yLNeaR8xMZ9nTLLhNQuGGM)

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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 $m3_cat_2 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $r1_tarski : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k9_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_cat_1 : \iota \Rightarrow \iota$ be given. Let $k4_tarski : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ be given. Let $k2_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_tarski : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_tarski : \iota \Rightarrow \iota$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m3_cat_2 X1 X0) \Rightarrow (\forall X2. \\
 & (m1_subset_1 X2 (u4_struct_0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 \\
 & (u4_struct_0 X0) \Rightarrow ((X2 = X3) \Rightarrow ((k3_graph_1 X1 X2 = k3_graph_1 X0 \\
 & X3) \wedge (k4_graph_1 X1 X2 = k4_graph_1 X0 X3)))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0.((v1_relat_1 X0) \wedge (v1_funct_1 X0) \Rightarrow (\forall X1.((\\
 & v1_relat_1 X1) \wedge (v1_funct_1 X1) \Rightarrow ((r1_tarski X0 X1) \Leftrightarrow ((r1_tarski \\
 & (k9_xtuple_0 X0) (k9_xtuple_0 X1)) \wedge (\forall X2.(X2 \in k9_xtuple_0 \\
 & X0) \Rightarrow (k1_funct_1 X0 X2 = k1_funct_1 X1 X2))))))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 \\ X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 \\ X0 X1 = k4_graph_1 X0 X2) \Rightarrow (k1_cat_1 X0 X2 X1 = k1_binop_1 (u1_cat_1 \\ X0) X1 X2)))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 \\ X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 \\ X0 X1 = k4_graph_1 X0 X2) \Leftrightarrow (k4_tarski X1 X2 \in k9_xtuple_0 (u1_cat_1 \\ X0)))))) \end{aligned} \quad (4)$$

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.

$$\begin{aligned} \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge \\ ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))) \wedge (m1_subset_1 X1 (u1_struct_0 \\ X0))) \Rightarrow (k4_graph_1 X0 (k4_cat_1 X0 X1) = X1) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0. (l1_cat_1 X0) \Rightarrow ((v1_funct_1 (u1_cat_1 X0)) \wedge (m1_subset_1 \\ (u1_cat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\ X0) (u4_struct_0 X0)) (u4_struct_0 X0)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (m3_cat_2 X1 X0) \Rightarrow ((\neg v2_struct_0 \\ X1) \wedge ((\neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))))) \end{aligned} \quad (8)$$

Assume the following.

$$\forall X0. (l1_cat_1 X0) \Rightarrow (l1_graph_1 X0) \quad (9)$$

Assume the following.

$$\forall X0.\forall X1.((l1_graph_1 X0)\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(m1_subset_1 (k2_graph_1 X0 X1) (u1_struct_0 X0)) \quad (10)$$

Assume the following.

$$\forall X0.\forall X1.k4_tarski X0 X1 = k2_tarski (k2_tarski X0 X1) (k1_tarski X0) \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.((\neg v2_struct_0 X1)\wedge((\neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 X1))))))))\Rightarrow((m3_cat_2 X1 X0)\Leftrightarrow((r1_tarski (u1_struct_0 X1) (u1_struct_0 X0))\wedge((\forall X2.(m1_subset_1 X2 (u1_struct_0 X1))\Rightarrow(\forall X3.(m1_subset_1 X3 (u1_struct_0 X1))\Rightarrow(\forall X4.(m1_subset_1 X4 (u1_struct_0 X0))\Rightarrow(\forall X5.(m1_subset_1 X5 (u1_struct_0 X0))\Rightarrow(((X2 = X4)\wedge(X3 = X5))\Rightarrow(r1_tarski (k2_cat_1 X1 X2 X3) (k2_cat_1 X0 X4 X5))))))))\wedge((r1_tarski (u1_cat_1 X1) (u1_cat_1 X0))\wedge(\forall X2.(m1_subset_1 X2 (u1_struct_0 X1))\Rightarrow(\forall X3.(m1_subset_1 X3 (u1_struct_0 X0))\Rightarrow((X2 = X3)\Rightarrow(k4_cat_1 X1 X2 = k4_cat_1 X0 X3)))))))))) \quad (12) \end{aligned}$$

Assume the following.

$$\forall X0.((v1_relat_1 X0)\wedge(v1_funct_1 X0))\Rightarrow(\forall X1.\forall X2.k1_binop_1 X0 X1 X2 = k1_funct_1 X0 (k4_tarski X1 X2)) \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))\Rightarrow(v1_relat_1 X2) \quad (14)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.(m3_cat_2 X1 X0)\Rightarrow(\forall X2.(m1_subset_1 X2 (u4_struct_0 X1))\Rightarrow(\forall X3.(m1_subset_1 X3 (u4_struct_0 X1))\Rightarrow(\forall X4.(m1_subset_1 X4 (u4_struct_0 X0))\Rightarrow(\forall X5.(m1_subset_1 X5 (u4_struct_0 X0))\Rightarrow(((X2 = X4)\wedge((X3 = X5)\wedge(k3_graph_1 X1 X3 = k4_graph_1 X1 X2))\Rightarrow(k1_cat_1 X1 X2 X3 = k1_cat_1 X0 X4 X5)))))))))) \end{aligned}$$