

t19_cat_4

(TMWA4erxtWF11Y7mRx5MA8rymTqRSRBNeqQ)

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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 $v3_cat_4 : \iota \Rightarrow o$ be given. Let $l1_cat_4 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ 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 $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $k2_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $u4_cat_4 : \iota \Rightarrow \iota$ be given. Let $u3_cat_4 : \iota \Rightarrow \iota$ be given. Let $l5_struct_0 : \iota \Rightarrow o$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ be given. Let $v10_cat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_cat_4 : \iota \Rightarrow \iota$ be given. Let $r2_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u2_cat_4 : \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0. \forall X1. \neg(X0 \in X1) \wedge (v1_xboole_0 X1) \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\ & X0))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. (m1_subset_1 X3 \\ & (u1_struct_0 X0)) \Rightarrow ((X1 \in k2_cat_1 X0 X2 X3) \Leftrightarrow ((k3_graph_1 X0 X1 = \\ & X2) \wedge (k4_graph_1 X0 X1 = X3)))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & ((\neg v1_xboole_0 X0) \wedge ((\neg v1_xboole_0 X1) \wedge (((v1_funct_1 X3) \wedge (v1_funct_2 X3 (k2_zfmisc_1 X0 X1) X2) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X0 X1) X2)))) \wedge ((m1_subset_1 X4 X0) \wedge (m1_subset_1 X5 X1)))))) \Rightarrow (k2_binop_1 X0 X1 X2 X3 X4 X5 = k1_binop_1 X3 X4 X5) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0. ((\neg v2_struct_0 X0) \wedge (l1_struct_0 X0)) \Rightarrow (\neg v1_xboole_0 (u1_struct_0 X0)) \quad (4)$$

Assume the following.

$$v1_xboole_0 k1_xboole_0 \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1_cat_4 X0) \Rightarrow ((v1_funct_1 (u4_cat_4 X0)) \wedge ((v1_funct_2 (u4_cat_4 X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u4_struct_0 X0)) \wedge (m1_subset_1 (u4_cat_4 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u4_struct_0 X0)))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1_cat_4 X0) \Rightarrow ((v1_funct_1 (u3_cat_4 X0)) \wedge ((v1_funct_2 (u3_cat_4 X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u4_struct_0 X0)) \wedge (m1_subset_1 (u3_cat_4 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u4_struct_0 X0)))))) \end{aligned} \quad (7)$$

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.

$$\forall X0. (l1_cat_4 X0) \Rightarrow (l1_cat_1 X0) \quad (10)$$

Assume the following.

$$\forall X0. (l1_cat_1 X0) \Rightarrow (l1_graph_1 X0) \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\ & X0)\wedge(l1_cat_4 X0)))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 \\ & X2 (u1_struct_0 X0))))\Rightarrow(m1_subset_1 (k2_cat_4 X0 X1 X2) (u1_struct_0 \\ & X0)) \end{aligned} \tag{12}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & (((\neg v1_xboole_0 X0)\wedge((\neg v1_xboole_0 X1)\wedge(((v1_funct_1 X3)\wedge((\\ & v1_funct_2 X3 (k2_zfmisc_1 X0 X1) X2)\wedge(m1_subset_1 X3 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X0 X1) X2))))\wedge((m1_subset_1 X4 X0)\wedge \\ & (m1_subset_1 X5 X1))))))\Rightarrow(m1_subset_1 (k2_binop_1 X0 X1 X2 X3 X4 \\ & X5) X2) \end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned} & \forall X0.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_4 X0))))))))\Rightarrow((v3_cat_4 X0)\Leftrightarrow((v10_cat_1 (u1_cat_4 \\ & X0) X0)\wedge(\forall X1.(m1_subset_1 X1 (u1_struct_0 X0))\Rightarrow(\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X0))\Rightarrow((k4_graph_1 X0 (k2_binop_1 \\ & (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u3_cat_4 X0) \\ & X1 X2) = X1)\wedge((k4_graph_1 X0 (k2_binop_1 (u1_struct_0 X0) (u1_struct_0 \\ & X0) (u4_struct_0 X0) (u4_cat_4 X0) X1 X2) = X2)\wedge(r2_cat_3 X0 (k5_binop_1 \\ & (u1_struct_0 X0) (u2_cat_4 X0) X1 X2) (k2_binop_1 (u1_struct_0 \\ & X0) (u1_struct_0 X0) (u4_struct_0 X0) (u3_cat_4 X0) X1 X2) (k2_binop_1 \\ & (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u4_cat_4 X0) \\ & X1 X2)))))))) \end{aligned} \tag{14}$$

Assume the following.

$$\begin{aligned} & \forall X0.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_cat_4 \\ & X0)))\Rightarrow(\forall X1.(m1_subset_1 X1 (u1_struct_0 X0))\Rightarrow(\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X0))\Rightarrow(k2_cat_4 X0 X1 X2 = k5_binop_1 \\ & (u1_struct_0 X0) (u2_cat_4 X0) X1 X2))) \end{aligned} \tag{15}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow (\forall X3. \\
& (m1_subset_1 X3 (u4_struct_0 X0)) \Rightarrow ((r2_cat_3 X0 X1 X2 X3) \Leftrightarrow ((k3_graph_1 \\
& X0 X2 = X1) \wedge ((k3_graph_1 X0 X3 = X1) \wedge (\forall X4.(m1_subset_1 X4 \\
& (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_subset_1 X5 (u4_struct_0 X0)) \Rightarrow \\
& (\forall X6.(m1_subset_1 X6 (u4_struct_0 X0)) \Rightarrow (\neg(X5 \in k2_cat_1 \\
& X0 X4 (k4_graph_1 X0 X2)) \wedge ((X6 \in k2_cat_1 X0 X4 (k4_graph_1 X0 X3)) \wedge \\
& (\forall X7.(m1_subset_1 X7 (u4_struct_0 X0)) \Rightarrow (\neg(X7 \in k2_cat_1 \\
& X0 X4 X1) \wedge (\forall X8.(m1_subset_1 X8 (u4_struct_0 X0)) \Rightarrow ((X8 \in \\
& k2_cat_1 X0 X4 X1) \Rightarrow (((k1_cat_1 X0 X8 X2 = X5) \wedge (k1_cat_1 X0 X8 X3 = X6)) \Leftrightarrow \\
& (X7 = X8))))))))))))))
\end{aligned} \tag{16}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow ((k2_cat_1 X0 (k2_cat_4 X0 X1 X2) X1 \neq k1_xboole_0) \wedge (k2_cat_1 \\
& X0 (k2_cat_4 X0 X1 X2) X2 \neq k1_xboole_0)))
\end{aligned}$$