

t23_cat_1

(TMPYZwLirXnrnjphuJbbKJVeirwBFSYEHuo)

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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 $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\ & X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 \\ & (u1_struct_0 X0)) \Rightarrow ((X1 \in k2_cat_1 X0 X2 X3) \Leftrightarrow ((k3_graph_1 X0 X1 = \\ & X2) \wedge (k4_graph_1 X0 X1 = X3)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge (l1_cat_1 X0))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 \\ & X2 (u1_struct_0 X0)))) \Rightarrow (\forall X3.(m1_cat_1 X3 X0 X1 X2) \Rightarrow (m1_subset_1 \\ & X3 (u4_struct_0 X0))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((l1_cat_1 X0) \wedge ((m1_subset_1 \\ & X1 (u4_struct_0 X0)) \wedge (m1_subset_1 X2 (u4_struct_0 X0)))) \Rightarrow (m1_subset_1 \\ & (k1_cat_1 X0 X1 X2) (u4_struct_0 X0)) \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\ & X0))) \Rightarrow ((v3_cat_1 X0) \Leftrightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 \\ & X0))) \Rightarrow (\forall X2.(m1_subset_1 X2 (u4_struct_0 X0))) \Rightarrow ((k3_graph_1 \\ & X0 X2 = k4_graph_1 X0 X1) \Rightarrow ((k3_graph_1 X0 (k1_cat_1 X0 X1 X2) = k3_graph_1 \\ & X0 X1) \wedge (k4_graph_1 X0 (k1_cat_1 X0 X1 X2) = k4_graph_1 X0 X2)))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\ & X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0))) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X0))) \Rightarrow ((k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \Rightarrow \\ & (\forall X3.(m1_subset_1 X3 (u4_struct_0 X0))) \Rightarrow ((m1_cat_1 X3 X0 \\ & X1 X2) \Leftrightarrow (X3 \in k2_cat_1 X0 X1 X2)))))) \end{aligned} \quad (5)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0))) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0))) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0))) \Rightarrow (\forall X4.(m1_cat_1 X4 X0 \\ & X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X2 X3) \Rightarrow (\neg(k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge \\ & ((k2_cat_1 X0 X2 X3 \neq k1_xboole_0) \wedge (\neg k1_cat_1 X0 X4 X5 \in k2_cat_1 \\ & X0 X1 X3)))))))))) \end{aligned}$$