

t58_cat_3

(TMV4PyfgpjRCNZ27pqAAjD1ZH1rsxx3sL9c)

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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 $r2_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ X0)) \Rightarrow (k4_cat_1 X0 X1 \in k2_cat_1 X0 X1 X1)) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 \\ X0 X2 = X1) \Rightarrow (k1_cat_1 X0 (k4_cat_1 X0 X1) X2 = X2)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ X0) \wedge (l1_cat_1 X0))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 \\ X2 (u1_struct_0 X0)))) \Rightarrow (\forall X3.(m1_cat_1 X3 X0 X1 X2) \Rightarrow (m1_subset_1 \\ X3 (u4_struct_0 X0))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow (l1_graph_1 X0) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & (l1_graph_1 X0))) \wedge (m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (m1_subset_1 \\ & (k4_graph_1 X0 X1) (u1_struct_0 X0)) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))) \wedge (m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (m1_cat_1 (k4_cat_1 X0 X1) X0 X1 X1) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\ & X0))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k2_cat_1 X0 X1 X2 = ReplSep (\\ & toset (\lambda X3 : \iota. m1_subset_1 X3 (u4_struct_0 X0))) (\lambda X3 : \iota. \\ & \iota. (k3_graph_1 X0 X3 = X1) \wedge (k4_graph_1 X0 X3 = X2)) (\lambda X3 : \iota. \\ & X3)))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u4_struct_0 X0)) \Rightarrow ((r2_cat_3 X0 X1 X2 X3) \Leftrightarrow ((k3_graph_1 \\ & X0 X2 = X1) \wedge ((k3_graph_1 X0 X3 = X1) \wedge (\forall X4. (m1_subset_1 X4 \\ & (u1_struct_0 X0)) \Rightarrow (\forall X5. (m1_subset_1 X5 (u4_struct_0 X0)) \Rightarrow \\ & (\forall X6. (m1_subset_1 X6 (u4_struct_0 X0)) \Rightarrow (\neg (X5 \in k2_cat_1 \\ & X0 X4 (k4_graph_1 X0 X2) \wedge (X6 \in k2_cat_1 X0 X4 (k4_graph_1 X0 X3)) \wedge \\ & (\forall X7. (m1_subset_1 X7 (u4_struct_0 X0)) \Rightarrow (\neg (X7 \in k2_cat_1 \\ & X0 X4 X1) \wedge (\forall X8. (m1_subset_1 X8 (u4_struct_0 X0)) \Rightarrow ((X8 \in \\ & k2_cat_1 X0 X4 X1) \Rightarrow (((k1_cat_1 X0 X8 X2 = X5) \wedge (k1_cat_1 X0 X8 X3 = X6)) \Leftrightarrow \\ & (X7 = X8)))))))))))))) \end{aligned} \quad (8)$$

Theorem 1

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u4_struct_0 X0)) \Rightarrow (\forall X4. (m1_subset_1 X4 \\ & (u4_struct_0 X0)) \Rightarrow (((r2_cat_3 X0 X1 X2 X3) \wedge ((X4 \in k2_cat_1 X0 X1 \\ & X1) \wedge ((k1_cat_1 X0 X4 X2 = X2) \wedge (k1_cat_1 X0 X4 X3 = X3)))) \Rightarrow (X4 = k4_cat_1 \\ & X0 X1)))))) \end{aligned}$$