

l45_oppcat_1
(TMTiswKYXRkzkyujzRyfQ5GBNJ2ffFhC4U9)

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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 $m2_cat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_oppcat_1 : \iota \Rightarrow \iota$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $k7_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & (l1_graph_1 X0))) \wedge (m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (k4_graph_1 \\ & X0 X1 = k2_graph_1 X0 X1) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge (v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (((\neg v2_struct_0 X1) \wedge ((\neg \\ & v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))))) \Rightarrow (\forall X2. \\ & (m2_cat_1 X2 (k2_oppcat_1 X0) X1) \Rightarrow (\forall X3. (m1_subset_1 X3 \\ & (u4_struct_0 X0)) \Rightarrow ((k3_funct_2 (u1_struct_0 X0) (u1_struct_0 \\ & X1) (k7_cat_1 X0 X1 (k9_oppcat_1 X0 X1 X2)) (k3_graph_1 X0 X3) = k4_graph_1 \\ & X1 (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 X1) (k9_oppcat_1 \\ & X0 X1 X2) X3)) \wedge (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X1) (k7_cat_1 \\ & X0 X1 (k9_oppcat_1 X0 X1 X2)) (k4_graph_1 X0 X3) = k3_graph_1 X1 (k3_funct_2 \\ & (u4_struct_0 X0) (u4_struct_0 X1) (k9_oppcat_1 X0 X1 X2) X3)))))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\
& \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
& X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
& (m2_cat_1 X2 (k2_oppcat_1 X0) X1) \Rightarrow (\forall X3.(m1_subset_1 X3 \\
& (u1_struct_0 X0) \Rightarrow (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 \\
& X1) (k9_oppcat_1 X0 X1 X2) (k4_cat_1 X0 X3) = k4_cat_1 X1 (k3_funct_2 \\
& (u1_struct_0 X0) (u1_struct_0 X1) (k7_cat_1 X0 X1 (k9_oppcat_1 \\
& X0 X1 X2) X3))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow (l1_graph_1 X0) \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\
& (l1_graph_1 X0))) \wedge (m1_subset_1 X1 (u4_struct_0 X0))) \Rightarrow (m1_subset_1 \\
& (k3_graph_1 X0 X1) (u1_struct_0 X0))
\end{aligned} \tag{5}$$

Assume the following.

$$\forall X0.\forall X1.((l1_graph_1 X0) \wedge (m1_subset_1 X1 (u4_struct_0 X0))) \Rightarrow (m1_subset_1 (k2_graph_1 X0 X1) (u1_struct_0 X0)) \tag{6}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\
& \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
& X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
& (m2_cat_1 X2 (k2_oppcat_1 X0) X1) \Rightarrow (\forall X3.(m1_subset_1 X3 \\
& (u4_struct_0 X0) \Rightarrow ((k3_funct_2 (u4_struct_0 X0) (u4_struct_0 \\
& X1) (k9_oppcat_1 X0 X1 X2) (k4_cat_1 X0 (k3_graph_1 X0 X3)) = k4_cat_1 \\
& X1 (k4_graph_1 X1 (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 X1) \\
& (k9_oppcat_1 X0 X1 X2) X3)) \wedge (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 \\
& X1) (k9_oppcat_1 X0 X1 X2) (k4_cat_1 X0 (k4_graph_1 X0 X3)) = k4_cat_1 \\
& X1 (k3_graph_1 X1 (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 X1) \\
& (k9_oppcat_1 X0 X1 X2) X3))))))
\end{aligned}$$