

t20_cat_4

(TMFtfcUavGUYrjDXc25Xyh6jj1yH2gfqrYq)

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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 $r2_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v10_cat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_cat_4 : \iota \Rightarrow \iota$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $u3_cat_4 : \iota \Rightarrow \iota$ be given. Let $u4_cat_4 : \iota \Rightarrow \iota$ 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. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0)))) \Rightarrow (k8_cat_4 X0 X1 X2 = k4_cat_4 X0 X1 X2) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0)))) \Rightarrow (k7_cat_4 X0 X1 X2 = k3_cat_4 X0 X1 X2) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_4 X0)))))) \Rightarrow ((v3_cat_4 X0) \Leftrightarrow ((v10_cat_1 (u1_cat_4 \\
& X0) X0) \wedge (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow ((k4_graph_1 X0 (k2_binop_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u3_cat_4 X0) \\
& X1 X2) = X1) \wedge ((k4_graph_1 X0 (k2_binop_1 (u1_struct_0 X0) (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u4_cat_4 X0) X1 X2) = X2) \wedge (r2_cat_3 X0 (k5_binop_1 \\
& (u1_struct_0 X0) (u2_cat_4 X0) X1 X2) (k2_binop_1 (u1_struct_0 \\
& X0) (u1_struct_0 X0) (u4_struct_0 X0) (u3_cat_4 X0) X1 X2) (k2_binop_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u4_cat_4 X0) \\
& X1 X2)))))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_4 \\
& X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k4_cat_4 X0 X1 X2 = k2_binop_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u4_cat_4 X0) \\
& X1 X2)))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_4 \\
& X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k3_cat_4 X0 X1 X2 = k2_binop_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u3_cat_4 X0) \\
& X1 X2)))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_4 \\
& X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k2_cat_4 X0 X1 X2 = k5_binop_1 \\
& (u1_struct_0 X0) (u2_cat_4 X0) X1 X2)))
\end{aligned} \tag{6}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow (r2_cat_3 X0 (k2_cat_4 X0 X1 X2) (k7_cat_4 X0 X1 X2) (k8_cat_4 \\
& X0 X1 X2))))))
\end{aligned}$$