

t30_catalg_1
(TMbvH7zfSk6mGTrTEE8fkjtiRbR8vYfmrKc)

October 27, 2020

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 $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_catalg_1 : \iota \Rightarrow \iota$ be given. Let $k10_catalg_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k13_catalg_1 : \iota \Rightarrow \iota$ be given. Let $k2_finseq_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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 $v3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9_catalg_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_catalg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow ((v3_msualg_1 (k13_catalg_1 X0) (k3_catalg_1 \\ & (u1_struct_0 X0))) \wedge (l3_msualg_1 (k13_catalg_1 X0) (k3_catalg_1 \\ & (u1_struct_0 X0)))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))) \Rightarrow (\forall X1.((v3_msualg_1 X1 (k3_catalg_1 \\
& (u1_struct_0 X0))) \wedge (l3_msualg_1 X1 (k3_catalg_1 (u1_struct_0 \\
& X0)))) \Rightarrow ((X1 = k13_catalg_1 X0) \Leftrightarrow ((\forall X2.(m1_subset_1 X2 (\\
& u1_struct_0 X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow \\
& (k1_funct_1 (u3_msualg_1 (k3_catalg_1 (u1_struct_0 X0)) X1) (\\
& k9_catalg_1 (u1_struct_0 X0) X2 X3) = k2_cat_1 X0 X2 X3))) \wedge ((\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k1_funct_1 (k5_msualg_1 (\\
& k3_catalg_1 (u1_struct_0 X0)) (k8_catalg_1 (u1_struct_0 X0) X2) \\
& X1) k1_xboole_0 = k4_cat_1 X0 X2)) \wedge (\forall X2.(m1_subset_1 X2 \\
& (u1_struct_0 X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow \\
& (\forall X4.(m1_subset_1 X4 (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_subset_1 \\
& X5 (u4_struct_0 X0)) \Rightarrow (\forall X6.(m1_subset_1 X6 (u4_struct_0 \\
& X0)) \Rightarrow (((k3_graph_1 X0 X5 = X2) \wedge ((k4_graph_1 X0 X5 = X3) \wedge ((k3_graph_1 \\
& X0 X6 = X3) \wedge (k4_graph_1 X0 X6 = X4)))) \Rightarrow (k1_funct_1 (k5_msualg_1 \\
& (k3_catalg_1 (u1_struct_0 X0)) (k10_catalg_1 (u1_struct_0 X0) \\
& X2 X3 X4) X1) (k2_finseq_4 (u4_struct_0 X0) X6 X5) = k1_cat_1 X0 X5 \\
& X6))))))))))
\end{aligned} \tag{3}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
& (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4.(m1_subset_1 X4 \\
& (u4_struct_0 X0)) \Rightarrow (\forall X5.(m1_subset_1 X5 (u4_struct_0 X0)) \Rightarrow \\
& (((X4 \in k2_cat_1 X0 X1 X2) \wedge (X5 \in k2_cat_1 X0 X2 X3)) \Rightarrow (k1_funct_1 (\\
& k5_msualg_1 (k3_catalg_1 (u1_struct_0 X0)) (k10_catalg_1 (u1_struct_0 \\
& X0) X1 X2 X3) (k13_catalg_1 X0)) (k2_finseq_4 (u4_struct_0 X0) X5 \\
& X4) = k1_cat_1 X0 X4 X5))))))
\end{aligned}$$