

l41_cat_3

(TMPtu9Y1RQqZuo7x1EP6q6aPSrG7fhFSUYf)

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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 $m2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k9_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg \\
 & v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
 & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
 & (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow \\
 & (\forall X4.(m1_subset_1 X4 (u1_struct_0 X0)) \Rightarrow (\neg (k2_cat_1 X0 \\
 & X3 X4 \neq k1_xboole_0) \wedge (k2_cat_1 X1 (k8_cat_1 X0 X1 X2 X3) (k8_cat_1 \\
 & X0 X1 X2 X4) = k1_xboole_0))))))
 \end{aligned}
 \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg \\
& v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
& X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
& (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 (u4_struct_0 X0)) \Rightarrow \\
& (\forall X4.(m1_subset_1 X4 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 X0 \\
& X4 = k4_graph_1 X0 X3) \Rightarrow ((k3_graph_1 X1 (k3_funct_2 (u4_struct_0 \\
& X0) (u4_struct_0 X1) X2 X4) = k4_graph_1 X1 (k3_funct_2 (u4_struct_0 \\
& X0) (u4_struct_0 X1) X2 X3) \wedge (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 \\
& X1) X2 (k1_cat_1 X0 X3 X4) = k1_cat_1 X1 (k3_funct_2 (u4_struct_0 \\
& X0) (u4_struct_0 X1) X2 X3) (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 \\
& X1) X2 X4)))))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\
& X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3.(m1_cat_1 X3 X0 \\
& X1 X2) \Rightarrow ((k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \Rightarrow ((k3_graph_1 X0 X3 = X1) \wedge \\
& (k4_graph_1 X0 X3 = X2))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
& (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\neg (k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge \\
& ((k2_cat_1 X0 X2 X3 \neq k1_xboole_0) \wedge (k2_cat_1 X0 X1 X3 = k1_xboole_0))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\
& X0) \wedge (l1_cat_1 X0))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 \\
& X2 (u1_struct_0 X0)))) \Rightarrow (\forall X3.(m1_cat_1 X3 X0 X1 X2) \Rightarrow (m1_subset_1 \\
& X3 (u4_struct_0 X0)))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\
& (((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 \\
& \quad X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 \\
& \quad X0))))))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge((m1_subset_1 \\
& \quad X2 (u1_struct_0 X0))\wedge((\neg v2_struct_0 X3)\wedge(\neg v11_struct_0 X3)\wedge \\
& \quad ((v2_cat_1 X3)\wedge((v3_cat_1 X3)\wedge((v4_cat_1 X3)\wedge((v5_cat_1 X3)\wedge \\
& \quad (v6_cat_1 X3)\wedge(l1_cat_1 X3))))))\wedge((m2_cat_1 X4 X0 X3)\wedge(m1_cat_1 \\
& \quad X5 X0 X1 X2))))\Rightarrow(m1_cat_1 (k9_cat_3 X0 X1 X2 X3 X4 X5) X3 (k8_cat_1 \\
& \quad X0 X3 X4 X1) (k8_cat_1 X0 X3 X4 X2))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2_struct_0 \\
& X0)\wedge(\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 \\
& \quad X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))\wedge(((\\
& \neg v2_struct_0 X1)\wedge(\neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 \\
& \quad X1)\wedge((v4_cat_1 X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 \\
& \quad X1))))))\wedge((m2_cat_1 X2 X0 X1)\wedge(m1_subset_1 X3 (u1_struct_0 \\
& \quad X0))))\Rightarrow(m1_subset_1 (k8_cat_1 X0 X1 X2 X3) (u1_struct_0 X1))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\
& (((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 \\
& \quad X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 \\
& \quad X0))))))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge((m1_subset_1 \\
& \quad X2 (u1_struct_0 X0))\wedge((m1_subset_1 X3 (u1_struct_0 X0))\wedge((m1_cat_1 \\
& \quad X4 X0 X1 X2)\wedge(m1_cat_1 X5 X0 X2 X3))))\Rightarrow(m1_cat_1 (k5_cat_1 X0 X1 \\
& \quad X2 X3 X4 X5) X0 X1 X3)
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge((v2_cat_1 \\
& X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\
& \quad X0)\wedge(l1_cat_1 X0))))))\Rightarrow(\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& \quad X0))\Rightarrow(\forall X2.(m1_subset_1 X2 (u1_struct_0 X0))\Rightarrow(\forall X3. \\
& \quad (m1_subset_1 X3 (u1_struct_0 X0))\Rightarrow(\forall X4.(m1_cat_1 X4 X0 \\
& \quad X1 X2)\Rightarrow(\forall X5.(m1_cat_1 X5 X0 X2 X3)\Rightarrow(\neg(k2_cat_1 X0 X1 X2\neq k1_xboole_0)\wedge \\
& \quad ((k2_cat_1 X0 X2 X3\neq k1_xboole_0)\wedge(k5_cat_1 X0 X1 X2 X3 X4 X5\neq k1_cat_1 \\
& \quad X0 X4 X5))))))
\end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow ((k2_cat_1 \\
& X0 X1 X2 \neq k1_xboole_0) \Rightarrow (\forall X3.((\neg v2_struct_0 X3) \wedge ((\neg v11_struct_0 \\
& X3) \wedge ((v2_cat_1 X3) \wedge ((v3_cat_1 X3) \wedge ((v4_cat_1 X3) \wedge ((v5_cat_1 \\
& X3) \wedge ((v6_cat_1 X3) \wedge (l1_cat_1 X3)))))))))) \Rightarrow (\forall X4.(m2_cat_1 \\
& X4 X0 X3) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X1 X2) \Rightarrow (k9_cat_3 X0 X1 X2 X3 \\
& X4 X5 = k3_funct_2 (u4_struct_0 X0) (u4_struct_0 X3) X4 X5))))))
\end{aligned} \tag{10}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg \\
& v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
& X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2. \\
& (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow \\
& (\forall X4.(m1_subset_1 X4 (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_subset_1 \\
& X5 (u1_struct_0 X0)) \Rightarrow (\neg(k2_cat_1 X0 X3 X4 \neq k1_xboole_0) \wedge ((k2_cat_1 \\
& X0 X4 X5 \neq k1_xboole_0) \wedge (\neg \forall X6.(m1_cat_1 X6 X0 X3 X4) \Rightarrow (\forall X7. \\
& (m1_cat_1 X7 X0 X4 X5) \Rightarrow (k9_cat_3 X0 X3 X5 X1 X2 (k5_cat_1 X0 X3 X4 X5 \\
& X6 X7) = k5_cat_1 X1 (k8_cat_1 X0 X1 X2 X3) (k8_cat_1 X0 X1 X2 X4) (k8_cat_1 \\
& X0 X1 X2 X5) (k9_cat_3 X0 X3 X4 X1 X2 X6) (k9_cat_3 X0 X4 X5 X1 X2 X7))))))))))
\end{aligned}$$