

t66_cat_4

(TMLQEfcSq8NdYu7NqRYwUnEt6vesamzgD35)

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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 $v6_cat_4 : \iota \Rightarrow o$ be given. Let $l2_cat_4 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k20_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r4_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k28_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k22_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k27_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k21_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v11_cat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u5_cat_4 : \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $u7_cat_4 : \iota \Rightarrow \iota$ be given. Let $u8_cat_4 : \iota \Rightarrow \iota$ be given. Let $k5_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u6_cat_4 : \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
 & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
 & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\neg (k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge \\
 & ((k2_cat_1 X0 X3 X2 \neq k1_xboole_0) \wedge (\neg \forall X4.(m1_cat_1 X4 X0 \\
 & X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X3 X2) \Rightarrow ((r4_cat_3 X0 X2 X4 X5) \Leftrightarrow \\
 & (\forall X6.(m1_subset_1 X6 (u1_struct_0 X0)) \Rightarrow (\neg (k2_cat_1 X0 \\
 & X1 X6 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X3 X6 \neq k1_xboole_0) \wedge (\neg (k2_cat_1 \\
 & X0 X2 X6 \neq k1_xboole_0) \wedge (\forall X7.(m1_cat_1 X7 X0 X1 X6) \Rightarrow (\forall X8. \\
 & (m1_cat_1 X8 X0 X3 X6) \Rightarrow (\exists X9.(m1_cat_1 X9 X0 X2 X6) \wedge (\forall X10. \\
 & (m1_cat_1 X10 X0 X2 X6) \Rightarrow (((k5_cat_1 X0 X1 X2 X6 X4 X10 = X7) \wedge (k5_cat_1 \\
 & X0 X3 X2 X6 X5 X10 = X8)) \Leftrightarrow (X9 = X10)))))))))))))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow ((k2_cat_1 X0 X1 (k20_cat_4 X0 X1 X2) \neq k1_xboole_0) \wedge (k2_cat_1 \\ & X0 X2 (k20_cat_4 X0 X1 X2) \neq k1_xboole_0)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0))) \Rightarrow (k28_cat_4 X0 X1 X2 = k22_cat_4 X0 X1 X2) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0))) \Rightarrow (k27_cat_4 X0 X1 X2 = k21_cat_4 X0 X1 X2) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0.(l2_cat_4 X0) \Rightarrow (l1_cat_1 X0) \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0))) \Rightarrow (m1_cat_1 (k28_cat_4 X0 X1 X2) X0 X2 (k20_cat_4 X0 X1 X2)) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0))) \Rightarrow (m1_cat_1 (k27_cat_4 X0 X1 X2) X0 X1 (k20_cat_4 X0 X1 X2)) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge (l2_cat_4 X0))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 \\ & X2 (u1_struct_0 X0)))) \Rightarrow (m1_subset_1 (k20_cat_4 X0 X1 X2) (u1_struct_0 \\ & X0)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l2_cat_4 X0)))))) \Rightarrow ((v6_cat_4 X0) \Leftrightarrow ((v11_cat_1 (u5_cat_4 \\
& X0) X0) \wedge (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow ((k3_graph_1 X0 (k2_binop_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u7_cat_4 X0) \\
& X1 X2) = X1) \wedge ((k3_graph_1 X0 (k2_binop_1 (u1_struct_0 X0) (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u8_cat_4 X0) X1 X2) = X2) \wedge (r4_cat_3 X0 (k5_binop_1 \\
& (u1_struct_0 X0) (u6_cat_4 X0) X1 X2) (k2_binop_1 (u1_struct_0 \\
& X0) (u1_struct_0 X0) (u4_struct_0 X0) (u7_cat_4 X0) X1 X2) (k2_binop_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u8_cat_4 X0) \\
& X1 X2)))))))))
\end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l2_cat_4 \\
& X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k22_cat_4 X0 X1 X2 = k2_binop_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u8_cat_4 X0) \\
& X1 X2)))
\end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l2_cat_4 \\
& X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k21_cat_4 X0 X1 X2 = k2_binop_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (u4_struct_0 X0) (u7_cat_4 X0) \\
& X1 X2)))
\end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l2_cat_4 \\
& X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k20_cat_4 X0 X1 X2 = k5_binop_1 \\
& (u1_struct_0 X0) (u6_cat_4 X0) X1 X2)))
\end{aligned} \tag{12}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\neg (k2_cat_1 \\
& X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X3 X2 \neq k1_xboole_0) \wedge (k2_cat_1 \\
& X0 (k20_cat_4 X0 X1 X3) X2 = k1_xboole_0))))))
\end{aligned}$$