

t77_cat_4 (TMWzwx-
ewgVE2NFnrYa5fz4eDnStZJAWGweq)

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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 $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k5_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k20_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k31_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k30_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k29_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $v9_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\
& (m1_subset_1 X4 (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_subset_1 X5 \\
& (u1_struct_0 X0)) \Rightarrow (\forall X6.(m1_cat_1 X6 X0 X1 X2) \Rightarrow (\forall X7. \\
& (m1_cat_1 X7 X0 X3 X4) \Rightarrow (\forall X8.(m1_cat_1 X8 X0 X2 X5) \Rightarrow (\forall X9. \\
& (m1_cat_1 X9 X0 X4 X5) \Rightarrow (\neg(k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 \\
& X0 X3 X4 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X2 X5 \neq k1_xboole_0) \wedge ((k2_cat_1 \\
& X0 X4 X5 \neq k1_xboole_0) \wedge (k5_cat_1 X0 (k20_cat_4 X0 X1 X3) (k20_cat_4 \\
& X0 X2 X4) X5 (k31_cat_4 X0 X1 X3 X2 X4 X6 X7) (k29_cat_4 X0 X2 X4 X5 X8 X9) \neq \\
& k29_cat_4 X0 X1 X3 X5 (k5_cat_1 X0 X1 X2 X5 X6 X8) (k5_cat_1 X0 X3 X4 X5 \\
& X7 X9))))))))))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (v9_cat_1 (k4_cat_1 X0 X1) X0 X1 X1))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_cat_1 X3 X0 X1 X2) \Rightarrow ((k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \Rightarrow (k5_cat_1 \\ & X0 X1 X2 X2 X3 (k4_cat_1 X0 X2) = X3)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.(l2_cat_4 X0) \Rightarrow (l1_cat_1 X0) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))) \wedge (m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (m1_cat_1 (k4_cat_1 X0 X1) X0 X1 X1) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (k30_cat_4 X0 X1 = k29_cat_4 X0 X1 X1 X1 (k4_cat_1 \\ & X0 X1) (k4_cat_1 X0 X1))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_cat_1 X3 X0 X1 X2) \Rightarrow ((v9_cat_1 X3 X0 X1 X2) \Leftrightarrow ((k2_cat_1 X0 X1 X2 \neq \\ & k1_xboole_0) \wedge ((k2_cat_1 X0 X2 X1 \neq k1_xboole_0) \wedge (\exists X4.(\\ & m1_cat_1 X4 X0 X2 X1) \wedge ((k5_cat_1 X0 X2 X1 X2 X4 X3 = k4_cat_1 X0 X2) \wedge \\ & (k5_cat_1 X0 X1 X2 X1 X3 X4 = k4_cat_1 X0 X1)))))))))) \end{aligned} \quad (7)$$

Theorem 1

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\ & (m1_cat_1 X4 X0 X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X3 X2) \Rightarrow (\neg (k2_cat_1 \\ & X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X3 X2 \neq k1_xboole_0) \wedge (k5_cat_1 \\ & X0 (k20_cat_4 X0 X1 X3) (k20_cat_4 X0 X2 X2) X2 (k31_cat_4 X0 X1 X3 X2 \\ & X2 X4 X5) (k30_cat_4 X0 X2) \neq k29_cat_4 X0 X1 X3 X2 X4 X5)))))))))) \end{aligned}$$