

t27_cat_4

(TMMBdF298oK7ymLE5SY92yuw3hnHZgYwE95)

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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 $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $v7_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k9_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $k5_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
 & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
 & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4.(m1_cat_1 X4 X0 \\
 & X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X2 X3) \Rightarrow ((v7_cat_1 (k5_cat_1 \\
 & X0 X1 X2 X3 X4 X5) X0 X1 X3) \Rightarrow ((k2_cat_1 X0 X1 X2 = k1_xboole_0) \vee ((k2_cat_1 \\
 & X0 X2 X3 = k1_xboole_0) \vee (v7_cat_1 X4 X0 X1 X2))))))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 \\
 & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
 & X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\neg (k2_cat_1 \\
 & X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X1 X3 \neq k1_xboole_0) \wedge (k2_cat_1 \\
 & X0 X1 (k2_cat_4 X0 X2 X3) = k1_xboole_0))))))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow ((k2_cat_1 X0 (k2_cat_4 X0 X1 X2) X1 \neq k1_xboole_0) \wedge (k2_cat_1 \\ & X0 (k2_cat_4 X0 X1 X2) X2 \neq k1_xboole_0)))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.(l1_cat_4 X0) \Rightarrow (l1_cat_1 X0) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 \\ & X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge ((v3_cat_4 \\ & X0) \wedge (l1_cat_4 X0)))))))))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge \\ & ((m1_subset_1 X2 (u1_struct_0 X0)) \wedge ((m1_subset_1 X3 (u1_struct_0 \\ & X0)) \wedge ((m1_cat_1 X4 X0 X3 X1) \wedge (m1_cat_1 X5 X0 X3 X2)))))) \Rightarrow (m1_cat_1 \\ & (k9_cat_4 X0 X1 X2 X3 X4 X5) X0 X3 (k2_cat_4 X0 X1 X2)) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0))) \Rightarrow (m1_cat_1 (k8_cat_4 X0 X1 X2) X0 (k2_cat_4 X0 X1 X2) X2) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0))) \Rightarrow (m1_cat_1 (k7_cat_4 X0 X1 X2) X0 (k2_cat_4 X0 X1 X2) X1) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge (l1_cat_4 X0))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 \\ & X2 (u1_struct_0 X0)))) \Rightarrow (m1_subset_1 (k2_cat_4 X0 X1 X2) (u1_struct_0 \\ & X0)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\
& (m1_cat_1 X4 X0 X3 X1) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X3 X2) \Rightarrow (\neg(k2_cat_1 \\
& X0 X3 X1 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X3 X2 \neq k1_xboole_0) \wedge (\neg \forall X6. \\
& (m1_cat_1 X6 X0 X3 (k2_cat_4 X0 X1 X2)) \Rightarrow ((X6 = k9_cat_4 X0 X1 X2 X3 X4 \\
& X5) \Leftrightarrow ((k5_cat_1 X0 X3 (k2_cat_4 X0 X1 X2) X1 X6 (k7_cat_4 X0 X1 X2) = \\
& X4) \wedge (k5_cat_1 X0 X3 (k2_cat_4 X0 X1 X2) X2 X6 (k8_cat_4 X0 X1 X2) = X5))))))))))))) \\
& \tag{9}
\end{aligned}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\
& (m1_cat_1 X4 X0 X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X1 X3) \Rightarrow (\neg(k2_cat_1 \\
& X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X1 X3 \neq k1_xboole_0) \wedge (((v7_cat_1 \\
& X4 X0 X1 X2) \vee (v7_cat_1 X5 X0 X1 X3)) \wedge (\neg v7_cat_1 (k9_cat_4 X0 X2 X3 \\
& X1 X4 X5) X0 X1 (k2_cat_4 X0 X2 X3)))))))))))))
\end{aligned}$$