

t78_cat_4

(TMF3oF5LufXxAH6v3rnef2vGhesSPunYGou)

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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 $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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 $k29_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $k28_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k27_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

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

(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.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4.(m1_subset_1 X4 \\ & (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X1 X2) \Rightarrow (\forall X6. \\ & (m1_cat_1 X6 X0 X2 X3) \Rightarrow (\forall X7.(m1_cat_1 X7 X0 X3 X4) \Rightarrow (\neg (k2_cat_1 \\ & X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X2 X3 \neq k1_xboole_0) \wedge ((k2_cat_1 \\ & X0 X3 X4 \neq k1_xboole_0) \wedge (k5_cat_1 X0 X1 X2 X4 X5 (k5_cat_1 X0 X2 X3 X4 \\ & X6 X7) \neq k5_cat_1 X0 X1 X3 X4 (k5_cat_1 X0 X1 X2 X3 X5 X6) X7)))))))))) \end{aligned} \quad (3)$$

Assume the following.

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

Assume the following.

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

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 \\ & X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 \\ & X0)))))))))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge ((m1_subset_1 \\ & X2 (u1_struct_0 X0)) \wedge ((m1_subset_1 X3 (u1_struct_0 X0)) \wedge ((m1_cat_1 \\ & X4 X0 X1 X2) \wedge (m1_cat_1 X5 X0 X2 X3)))))) \Rightarrow (m1_cat_1 (k5_cat_1 X0 X1 \\ & X2 X3 X4 X5) X0 X1 X3) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\ & X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 \\ & X0)\wedge((v6_cat_1 X0)\wedge((v6_cat_4 X0)\wedge(l2_cat_4 X0))))))))))\wedge((\\ & m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X2 (u1_struct_0 \\ & X0)))\Rightarrow(m1_cat_1 (k28_cat_4 X0 X1 X2) X0 X2 (k20_cat_4 X0 X1 X2)) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\ & X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 \\ & X0)\wedge((v6_cat_1 X0)\wedge((v6_cat_4 X0)\wedge(l2_cat_4 X0))))))))))\wedge((\\ & m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X2 (u1_struct_0 \\ & X0)))\Rightarrow(m1_cat_1 (k27_cat_4 X0 X1 X2) X0 X1 (k20_cat_4 X0 X1 X2)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\ & X0)\wedge(l2_cat_4 X0)))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 \\ & X2 (u1_struct_0 X0))))\Rightarrow(m1_subset_1 (k20_cat_4 X0 X1 X2) (u1_struct_0 \\ & X0)) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge((v6_cat_4 X0)\wedge(l2_cat_4 X0))))))))))\Rightarrow(\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0))\Rightarrow(\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0))\Rightarrow(\forall X3.(m1_subset_1 X3 (u1_struct_0 X0))\Rightarrow(\forall X4. \\ & (m1_subset_1 X4 (u1_struct_0 X0))\Rightarrow(\forall X5.(m1_cat_1 X5 X0 \\ & X1 X3)\Rightarrow(\forall X6.(m1_cat_1 X6 X0 X2 X4)\Rightarrow(k31_cat_4 X0 X1 X2 X3 X4 \\ & X5 X6 = k29_cat_4 X0 X1 X2 (k20_cat_4 X0 X3 X4) (k5_cat_1 X0 X1 X3 (k20_cat_4 \\ & X0 X3 X4) X5 (k27_cat_4 X0 X3 X4)) (k5_cat_1 X0 X2 X4 (k20_cat_4 X0 X3 \\ & X4) X6 (k28_cat_4 X0 X3 X4)))))))))) \end{aligned} \quad (10)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\ & (m1_subset_1 X4 (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_subset_1 X5 \\ & (u1_struct_0 X0)) \Rightarrow (\forall X6.(m1_subset_1 X6 (u1_struct_0 X0)) \Rightarrow \\ & (\forall X7.(m1_cat_1 X7 X0 X1 X2) \Rightarrow (\forall X8.(m1_cat_1 X8 X0 X3 \\ & X4) \Rightarrow (\forall X9.(m1_cat_1 X9 X0 X2 X5) \Rightarrow (\forall X10.(m1_cat_1 \\ & X10 X0 X4 X6) \Rightarrow (\neg(k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X3 \\ & X4 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X2 X5 \neq k1_xboole_0) \wedge ((k2_cat_1 \\ & X0 X4 X6 \neq k1_xboole_0) \wedge (k5_cat_1 X0 (k20_cat_4 X0 X1 X3) (k20_cat_4 \\ & X0 X2 X4) (k20_cat_4 X0 X5 X6) (k31_cat_4 X0 X1 X3 X2 X4 X7 X8) (k31_cat_4 \\ & X0 X2 X4 X5 X6 X9 X10) \neq k31_cat_4 X0 X1 X3 X5 X6 (k5_cat_1 X0 X1 X2 X5 X7 \\ & X9) (k5_cat_1 X0 X3 X4 X6 X8 X10)))))))))))))) \end{aligned}$$