

t76_cat_4

(TMXMKG1LB56zcyAyHqnGAT7zFU7g1aoQvr8)

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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 $k29_cat.4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_cat.1 : \iota \Rightarrow o$ be given. Let $k28_cat.4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct.0 X0) \wedge ((\neg v11_struct.0 X0) \wedge ((v2_cat.1 \\ & X0) \wedge ((v3_cat.1 X0) \wedge ((v4_cat.1 X0) \wedge ((v5_cat.1 X0) \wedge ((v6_cat.1 \\ & X0) \wedge ((v6_cat.4 X0) \wedge (l2_cat.4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset.1 \\ & X1 (u1_struct.0 X0)) \Rightarrow (\forall X2.(m1_subset.1 X2 (u1_struct.0 \\ & X0)) \Rightarrow (\forall X3.(m1_subset.1 X3 (u1_struct.0 X0)) \Rightarrow (\forall X4. \\ & (m1_subset.1 X4 (u1_struct.0 X0)) \Rightarrow (\forall X5.(m1_cat.1 X5 X0 \\ & X1 X2) \Rightarrow (\forall X6.(m1_cat.1 X6 X0 X3 X2) \Rightarrow (\forall X7.(m1_cat.1 \\ & X7 X0 X2 X4) \Rightarrow (\neg(k2_cat.1 X0 X1 X2 \neq k1_xboole.0) \wedge ((k2_cat.1 X0 X3 \\ & X2 \neq k1_xboole.0) \wedge ((k2_cat.1 X0 X2 X4 \neq k1_xboole.0) \wedge (k29_cat.4 \\ & X0 X1 X3 X4 (k5_cat.1 X0 X1 X2 X4 X5 X7) (k5_cat.1 X0 X3 X2 X4 X6 X7) \neq k5_cat.1 \\ & X0 (k20_cat.4 X0 X1 X3) X2 X4 (k29_cat.4 X0 X1 X3 X2 X5 X6) X7))))))))))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct.0 X0) \wedge ((\neg v11_struct.0 X0) \wedge ((v2_cat.1 \\ & X0) \wedge ((v3_cat.1 X0) \wedge ((v4_cat.1 X0) \wedge ((v5_cat.1 X0) \wedge ((v6_cat.1 \\ & X0) \wedge ((v6_cat.4 X0) \wedge (l2_cat.4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset.1 \\ & X1 (u1_struct.0 X0)) \Rightarrow (\forall X2.(m1_subset.1 X2 (u1_struct.0 \\ & X0)) \Rightarrow (\forall X3.(m1_subset.1 X3 (u1_struct.0 X0)) \Rightarrow (\neg(k2_cat.1 \\ & X0 X1 X2 \neq k1_xboole.0) \wedge ((k2_cat.1 X0 X3 X2 \neq k1_xboole.0) \wedge (k2_cat.1 \\ & X0 (k20_cat.4 X0 X1 X3) X2 = k1_xboole.0)))))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow ((k2_cat_1 X0 X1 (k20_cat_4 X0 X1 X2) \neq k1_xboole_0) \wedge (k2_cat_1 \\ & X0 X2 (k20_cat_4 X0 X1 X2) \neq k1_xboole_0)))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4.(m1_subset_1 X4 \\ & (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X1 X2) \Rightarrow (\forall X6. \\ & (m1_cat_1 X6 X0 X2 X3) \Rightarrow (\forall X7.(m1_cat_1 X7 X0 X3 X4) \Rightarrow (\neg (k2_cat_1 \\ & X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X2 X3 \neq k1_xboole_0) \wedge ((k2_cat_1 \\ & X0 X3 X4 \neq k1_xboole_0) \wedge (k5_cat_1 X0 X1 X2 X4 X5 (k5_cat_1 X0 X2 X3 X4 \\ & X6 X7) \neq k5_cat_1 X0 X1 X3 X4 (k5_cat_1 X0 X1 X2 X3 X5 X6) X7)))))))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\neg (k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge \\ & ((k2_cat_1 X0 X2 X3 \neq k1_xboole_0) \wedge (k2_cat_1 X0 X1 X3 = k1_xboole_0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \wedge ((\\ & m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0))) \Rightarrow (k28_cat_4 X0 X1 X2 = k22_cat_4 X0 X1 X2) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.(l2_cat_4 X0) \Rightarrow (l1_cat_1 X0) \quad (7)$$

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.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\
& (((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge(v2_cat_1 X0)\wedge(v3_cat_1 \\
& \quad X0)\wedge(v4_cat_1 X0)\wedge(v5_cat_1 X0)\wedge(v6_cat_1 X0)\wedge(v6_cat_4 \\
& \quad X0)\wedge(l2_cat_4 X0))))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge \\
& \quad ((m1_subset_1 X2 (u1_struct_0 X0))\wedge(m1_subset_1 X3 (u1_struct_0 \\
& \quad X0))\wedge(m1_cat_1 X4 X0 X1 X3)\wedge(m1_cat_1 X5 X0 X2 X3))))\Rightarrow(m1_cat_1 \\
& \quad (k29_cat_4 X0 X1 X2 X3 X4 X5) X0 (k20_cat_4 X0 X1 X2) X3)
\end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 \\
& \quad X0)\wedge(v2_cat_1 X0)\wedge(v3_cat_1 X0)\wedge(v4_cat_1 X0)\wedge(v5_cat_1 \\
& \quad X0)\wedge(v6_cat_1 X0)\wedge(v6_cat_4 X0)\wedge(l2_cat_4 X0))))\wedge((\\
& \quad m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X2 (u1_struct_0 \\
& \quad X0)))\Rightarrow(m1_cat_1 (k28_cat_4 X0 X1 X2) X0 X2 (k20_cat_4 X0 X1 X2))
\end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 \\
& \quad X0)\wedge(v2_cat_1 X0)\wedge(v3_cat_1 X0)\wedge(v4_cat_1 X0)\wedge(v5_cat_1 \\
& \quad X0)\wedge(v6_cat_1 X0)\wedge(v6_cat_4 X0)\wedge(l2_cat_4 X0))))\wedge((\\
& \quad m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X2 (u1_struct_0 \\
& \quad X0)))\Rightarrow(m1_cat_1 (k27_cat_4 X0 X1 X2) X0 X1 (k20_cat_4 X0 X1 X2))
\end{aligned} \tag{11}$$

Assume the following.

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

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\
& (m1_subset_1 X4 (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 \\
& X1 X3) \Rightarrow (\forall X6.(m1_cat_1 X6 X0 X2 X4) \Rightarrow (k31_cat_4 X0 X1 X2 X3 X4 \\
& X5 X6 = k29_cat_4 X0 X1 X2 (k20_cat_4 X0 X3 X4) (k5_cat_1 X0 X1 X3 (k20_cat_4 \\
& X0 X3 X4) X5 (k27_cat_4 X0 X3 X4)) (k5_cat_1 X0 X2 X4 (k20_cat_4 X0 X3 \\
& X4) X6 (k28_cat_4 X0 X3 X4))))))))))
\end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge ((v6_cat_4 X0) \wedge (l2_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\
& (m1_cat_1 X4 X0 X1 X3) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X2 X3) \Rightarrow (\neg(k2_cat_1 \\
& X0 X1 X3 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X2 X3 \neq k1_xboole_0) \wedge (\neg \forall X6. \\
& (m1_cat_1 X6 X0 (k20_cat_4 X0 X1 X2) X3) \Rightarrow ((X6 = k29_cat_4 X0 X1 X2 X3 \\
& X4 X5) \Leftrightarrow ((k5_cat_1 X0 X1 (k20_cat_4 X0 X1 X2) X3 (k27_cat_4 X0 X1 X2) \\
& X6 = X4) \wedge (k5_cat_1 X0 X2 (k20_cat_4 X0 X1 X2) X3 (k28_cat_4 X0 X1 X2) \\
& X6 = X5))))))))))
\end{aligned} \tag{14}$$

Theorem 1

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