

t47_cat_1

(TMGeAyHSgwhLTFut66gmGDDpeyZ9tiTxPi)

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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 $l1_cat_1 : \iota \Rightarrow o$ 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 $v9_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k6_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4.(m1_cat_1 X4 X0 \\ & X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X2 X3) \Rightarrow (((v9_cat_1 X4 X0 X1 X2) \wedge \\ & (v9_cat_1 X5 X0 X2 X3)) \Rightarrow (v9_cat_1 (k5_cat_1 X0 X1 X2 X3 X4 X5) X0 X1 \\ & X3))))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_cat_1 X3 X0 X1 X2) \Rightarrow ((k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \Rightarrow (k5_cat_1 \\ & X0 X1 X1 X2 (k4_cat_1 X0 X1) X3 = X3)))) \end{aligned} \tag{2}$$

Assume the following.

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

Assume the following.

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

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2_struct_0 \\
& X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 \\
& X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0))))))) \wedge ((m1_subset_1 \\
& X1 (u1_struct_0 X0)) \wedge ((m1_subset_1 X2 (u1_struct_0 X0)) \wedge (m1_cat_1 \\
& X3 X0 X1 X2))) \Rightarrow (m1_cat_1 (k6_cat_1 X0 X1 X2 X3) X0 X2 X1)
\end{aligned} \tag{5}$$

Assume the following.

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

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
& (m1_cat_1 X3 X0 X1 X2) \Rightarrow ((v9_cat_1 X3 X0 X1 X2) \Rightarrow (\forall X4.(m1_cat_1 \\
& X4 X0 X2 X1) \Rightarrow ((X4 = k6_cat_1 X0 X1 X2 X3) \Leftrightarrow ((k5_cat_1 X0 X2 X1 X2 X4 X3 = \\
& k4_cat_1 X0 X2) \wedge (k5_cat_1 X0 X1 X2 X1 X3 X4 = k4_cat_1 X0 X1))))))))) \\
& \hspace{15em} (7)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
& (m1_cat_1 X3 X0 X1 X2) \Rightarrow ((v9_cat_1 X3 X0 X1 X2) \Leftrightarrow ((k2_cat_1 X0 X1 X2 \neq \\
& k1_xboole_0) \wedge ((k2_cat_1 X0 X2 X1 \neq k1_xboole_0) \wedge (\exists X4.(\\
& m1_cat_1 X4 X0 X2 X1) \wedge ((k5_cat_1 X0 X2 X1 X2 X4 X3 = k4_cat_1 X0 X2) \wedge \\
& (k5_cat_1 X0 X1 X2 X1 X3 X4 = k4_cat_1 X0 X1))))))))) \\
& \hspace{15em} (8)
\end{aligned}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
& (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4.(m1_cat_1 X4 X0 \\
& X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X2 X3) \Rightarrow (((v9_cat_1 X4 X0 X1 X2) \wedge \\
& (v9_cat_1 X5 X0 X2 X3) \Rightarrow (k6_cat_1 X0 X1 X3 (k5_cat_1 X0 X1 X2 X3 X4 X5) = \\
& k5_cat_1 X0 X3 X2 X1 (k6_cat_1 X0 X2 X3 X5) (k6_cat_1 X0 X1 X2 X4)))))))))
\end{aligned}$$