

t82_cat_3

(TMWZbm1c5wwLK6qyj9R58cMjTFa5Kog6ugn)

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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 $r4_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $v2_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
 & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
 & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\neg(k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge \\
 & ((k2_cat_1 X0 X3 X2 \neq k1_xboole_0) \wedge (\neg \forall X4.(m1_cat_1 X4 X0 \\
 & X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X3 X2) \Rightarrow (r4_cat_3 X0 X2 X4 X5) \Leftrightarrow \\
 & (\forall X6.(m1_subset_1 X6 (u1_struct_0 X0)) \Rightarrow (\neg(k2_cat_1 X0 \\
 & X1 X6 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X3 X6 \neq k1_xboole_0) \wedge (\neg(k2_cat_1 \\
 & X0 X2 X6 \neq k1_xboole_0) \wedge (\forall X7.(m1_cat_1 X7 X0 X1 X6) \Rightarrow (\forall X8. \\
 & (m1_cat_1 X8 X0 X3 X6) \Rightarrow (\exists X9.(m1_cat_1 X9 X0 X2 X6) \wedge (\forall X10. \\
 & (m1_cat_1 X10 X0 X2 X6) \Rightarrow (((k5_cat_1 X0 X1 X2 X6 X4 X10 = X7) \wedge (k5_cat_1 \\
 & X0 X3 X2 X6 X5 X10 = X8)) \Leftrightarrow (X9 = X10))))))))))))))
 \end{aligned} \tag{1}$$

Assume the following.

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

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\ & X0)\wedge(l1_cat_1 X0)))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 \\ & X2 (u1_struct_0 X0))))\Rightarrow(\exists X3.m1_cat_1 X3 X0 X1 X2) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\ & ((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))\wedge(m1_subset_1 \\ & X1 (u1_struct_0 X0)))\Rightarrow(m1_cat_1 (k4_cat_1 X0 X1) X0 X1 X1) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0))\Rightarrow(\forall X2.(m1_subset_1 X2 (u1_struct_0 X0))\Rightarrow(\forall X3. \\ & (m1_cat_1 X3 X0 X1 X2)\Rightarrow((v2_cat_3 X3 X0 X1 X2)\Leftrightarrow((k2_cat_1 X0 X1 X2\neq \\ & k1_xboole_0)\wedge((k2_cat_1 X0 X2 X1\neq k1_xboole_0)\wedge(\exists X4.(\\ & m1_cat_1 X4 X0 X2 X1)\wedge(k5_cat_1 X0 X1 X2 X1 X3 X4 = k4_cat_1 X0 X1)))))))) \end{aligned} \quad (5)$$

Theorem 1

$$\begin{aligned} & \forall X0.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0))\Rightarrow(\forall X2.(m1_subset_1 X2 (u1_struct_0 X0))\Rightarrow(\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0))\Rightarrow(\forall X4.(m1_cat_1 X4 X0 \\ & X1 X2)\Rightarrow(\forall X5.(m1_cat_1 X5 X0 X3 X2)\Rightarrow((r4_cat_3 X0 X2 X4 X5)\Rightarrow \\ & ((k2_cat_1 X0 X1 X2 = k1_xboole_0)\vee((k2_cat_1 X0 X3 X2 = k1_xboole_0)\vee \\ & ((k2_cat_1 X0 X1 X3 = k1_xboole_0)\vee((k2_cat_1 X0 X3 X1 = k1_xboole_0)\vee \\ & ((v2_cat_3 X4 X0 X1 X2)\wedge(v2_cat_3 X5 X0 X3 X2)))))))))) \end{aligned}$$