

l40_nattra_1 (TMN-
VHRE6HKNbMLXi6biHW4sWSaaNxcGqZXz)

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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 $m2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_nattra_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r1_nattra_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_nattra_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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 $v9_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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. Let $k8_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_nattra_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
 & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\
 & (m1_cat_1 X3 X0 X1 X2) \Rightarrow ((k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \Rightarrow ((v9_cat_1 \\
 & X3 X0 X1 X2) \Leftrightarrow ((k2_cat_1 X0 X2 X1 \neq k1_xboole_0) \wedge (\exists X4.(m1_cat_1 \\
 & X4 X0 X2 X1) \wedge ((k5_cat_1 X0 X2 X1 X2 X4 X3 = k4_cat_1 X0 X2) \wedge (k5_cat_1 \\
 & X0 X1 X2 X1 X3 X4 = k4_cat_1 X0 X1))))))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2_struct_0 \\
 & X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 \\
 & X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0))))))) \wedge (((\\
 & \neg v2_struct_0 X1) \wedge ((\neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 \\
 & X1) \wedge ((v4_cat_1 X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 \\
 & X1)))))))))) \wedge ((m2_cat_1 X2 X0 X1) \wedge (m1_subset_1 X3 (u1_struct_0 \\
 & X0)))) \Rightarrow (m1_subset_1 (k8_cat_1 X0 X1 X2 X3) (u1_struct_0 X1))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\
& (((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 \\
& X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 \\
& X0))))))))\wedge(((\neg v2_struct_0 X1)\wedge((\neg v11_struct_0 X1)\wedge((v2_cat_1 \\
& X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 \\
& X1)\wedge(l1_cat_1 X1))))))))\wedge((m2_cat_1 X2 X0 X1)\wedge((m2_cat_1 X3 X0 \\
& X1)\wedge((m1_nattra_1 X4 X0 X1 X2 X3)\wedge(m1_subset_1 X5 (u1_struct_0 \\
& X0))))))\Rightarrow(m1_cat_1 (k4_nattra_1 X0 X1 X2 X3 X4 X5) X1 (k8_cat_1 \\
& X0 X1 X2 X5) (k8_cat_1 X0 X1 X3 X5))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\
& X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\
& X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.((\neg v2_struct_0 X1)\wedge((\\
& \neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 \\
& X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 X1))))))))\Rightarrow(\forall X2. \\
& (m2_cat_1 X2 X0 X1)\Rightarrow(\forall X3.(m2_cat_1 X3 X0 X1)\Rightarrow((r1_nattra_1 \\
& X0 X1 X2 X3)\Leftrightarrow(\forall X4.(m1_subset_1 X4 (u1_struct_0 X0))\Rightarrow(k2_cat_1 \\
& X1 (k8_cat_1 X0 X1 X2 X4) (k8_cat_1 X0 X1 X3 X4)\neq k1_xboole_0))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\
& X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\
& X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.((\neg v2_struct_0 X1)\wedge((\\
& \neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 \\
& X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 X1))))))))\Rightarrow(\forall X2. \\
& (m2_cat_1 X2 X0 X1)\Rightarrow(\forall X3.(m2_cat_1 X3 X0 X1)\Rightarrow(\forall X4. \\
& (m1_nattra_1 X4 X0 X1 X2 X3)\Rightarrow((v1_nattra_1 X4 X0 X1 X2 X3)\Leftrightarrow(\forall X5. \\
& (m1_subset_1 X5 (u1_struct_0 X0))\Rightarrow(v9_cat_1 (k4_nattra_1 X0 X1 \\
& X2 X3 X4 X5) X1 (k8_cat_1 X0 X1 X2 X5) (k8_cat_1 X0 X1 X3 X5))))))
\end{aligned} \tag{5}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\
& X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\
& X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.((\neg v2_struct_0 X1)\wedge((\\
& \neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 \\
& X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 X1))))))))\Rightarrow(\forall X2. \\
& (m2_cat_1 X2 X0 X1)\Rightarrow(\forall X3.(m2_cat_1 X3 X0 X1)\Rightarrow(\forall X4. \\
& (m1_nattra_1 X4 X0 X1 X2 X3)\Rightarrow(((r1_nattra_1 X0 X1 X2 X3)\wedge(v1_nattra_1 \\
& X4 X0 X1 X2 X3))\Rightarrow(r1_nattra_1 X0 X1 X3 X2))))))
\end{aligned}$$