

t20_oppcat_1 (TMQJMMNjbFqifaMXisiMFJN- mKGVLM5SFgxU)

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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 $k7_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_oppcat_1 : \iota \Rightarrow \iota$ be given. Let $k3_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_cat_1 : \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 (k2_oppcat_1 X0))) \Rightarrow \\
& (((k2_cat_1 (k2_oppcat_1 X0) (k3_oppcat_1 X0 X1) X2 \neq k1_xboole_0) \Rightarrow \\
& (\forall X3.(m1_cat_1 X3 (k2_oppcat_1 X0) (k3_oppcat_1 X0 X1) X2) \Rightarrow \\
& (k1_cat_1 (k2_oppcat_1 X0) (k7_oppcat_1 X0 X1 X1 (k4_cat_1 X0 X1)) \\
& X3 = X3))) \wedge ((k2_cat_1 (k2_oppcat_1 X0) X2 (k3_oppcat_1 X0 X1) \neq k1_xboole_0) \Rightarrow \\
& (\forall X3.(m1_cat_1 X3 (k2_oppcat_1 X0) X2 (k3_oppcat_1 X0 X1)) \Rightarrow \\
& (k1_cat_1 (k2_oppcat_1 X0) X3 (k7_oppcat_1 X0 X1 X1 (k4_cat_1 X0 \\
& X1)) = X3))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow ((\neg v2_struct_0 (k2_oppcat_1 X0)) \wedge \\
& ((\neg v11_struct_0 (k2_oppcat_1 X0)) \wedge ((v1_cat_1 (k2_oppcat_1 X0)) \wedge \\
& ((v2_cat_1 (k2_oppcat_1 X0)) \wedge ((v3_cat_1 (k2_oppcat_1 X0)) \wedge \\
& (v4_cat_1 (k2_oppcat_1 X0)) \wedge ((v5_cat_1 (k2_oppcat_1 X0)) \wedge (v6_cat_1 \\
& (k2_oppcat_1 X0))))))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2_struct_0 \\ & X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 \\ & X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge((m1_subset_1 \\ & X1 (u1_struct_0 X0))\wedge((m1_subset_1 X2 (u1_struct_0 X0))\wedge(m1_cat_1 \\ & X3 X0 X1 X2))))\Rightarrow(m1_cat_1 (k7_oppcat_1 X0 X1 X2 X3) (k2_oppcat_1 \\ & X0) (k3_oppcat_1 X0 X2) (k3_oppcat_1 X0 X1)) \end{aligned} \quad (3)$$

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.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\ & ((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge \\ & ((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge(m1_subset_1 X1 (u1_struct_0 \\ & X0)))\Rightarrow(m1_subset_1 (k3_oppcat_1 X0 X1) (u1_struct_0 (k2_oppcat_1 \\ & X0))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow((\neg v2_struct_0 (k2_oppcat_1 X0))\wedge \\ & ((\neg v11_struct_0 (k2_oppcat_1 X0))\wedge((v1_cat_1 (k2_oppcat_1 X0))\wedge \\ & (l1_cat_1 (k2_oppcat_1 X0)))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0))\Rightarrow(k3_oppcat_1 X0 X1 = X1)) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v5_cat_1 \\ & X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0)))))\Rightarrow(\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0))\Rightarrow(\forall X2.(m1_cat_1 X2 X0 X1 X1)\Rightarrow((X2 = k4_cat_1 \\ & X0 X1)\Leftrightarrow(\forall X3.(m1_subset_1 X3 (u1_struct_0 X0))\Rightarrow(((k2_cat_1 \\ & X0 X1 X3\neq k1_xboole_0)\Rightarrow(\forall X4.(m1_cat_1 X4 X0 X1 X3)\Rightarrow(k1_cat_1 \\ & X0 X2 X4 = X4))\wedge((k2_cat_1 X0 X3 X1\neq k1_xboole_0)\Rightarrow(\forall X4.(\\ & m1_cat_1 X4 X0 X3 X1)\Rightarrow(k1_cat_1 X0 X4 X2 = X4)))))))))) \end{aligned} \quad (8)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (k7_oppcat_1 X0 X1 X1 (k4_cat_1 X0 X1) = k4_cat_1 (k2_oppcat_1 \\ & X0) (k3_oppcat_1 X0 X1))) \end{aligned}$$