

t19_oppcat_1

(TMK1eXK5hgN9gyPDrqxtMzyWftW3N1tZbSi)

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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 $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k7_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_oppcat_1 : \iota \Rightarrow \iota$ be given. Let $k5_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Assume the following.

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

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\neg(k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge \\ & ((k2_cat_1 X0 X2 X3 \neq k1_xboole_0) \wedge (\neg \forall X4.(m1_cat_1 X4 X0 \\ & X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X2 X3) \Rightarrow (k5_oppcat_1 X0 (k1_cat_1 \\ & X0 X4 X5) = k1_cat_1 (k2_oppcat_1 X0) (k7_oppcat_1 X0 X2 X3 X5) (k7_oppcat_1 \\ & X0 X1 X2 X4)))))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 \\ & X0)\wedge(l1_cat_1 X0)))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 \\ & X2 (u1_struct_0 X0)))\Rightarrow(\forall X3.(m1_cat_1 X3 X0 X1 X2)\Rightarrow(m1_subset_1 \\ & X3 (u4_struct_0 X0))) \end{aligned} \quad (3)$$

Assume the following.

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

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge(v2_cat_1 \\ & X0)\wedge(v3_cat_1 X0)\wedge(v4_cat_1 X0)\wedge(v5_cat_1 X0)\wedge(v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))\Rightarrow(\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0))\Rightarrow(\forall X2.(m1_subset_1 X2 (u1_struct_0 X0))\Rightarrow((k2_cat_1 \\ & X0 X1 X2\neq k1_xboole_0)\Rightarrow(\forall X3.(m1_cat_1 X3 X0 X1 X2)\Rightarrow(k7_oppcat_1 \\ & X0 X1 X2 X3 = X3)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge(v2_cat_1 \\ & X0)\wedge(v3_cat_1 X0)\wedge(v4_cat_1 X0)\wedge(v5_cat_1 X0)\wedge(v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))\Rightarrow(\forall X1.(m1_subset_1 X1 (u4_struct_0 \\ & X0))\Rightarrow(k5_oppcat_1 X0 X1 = X1)) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge(v2_cat_1 \\ & X0)\wedge(v3_cat_1 X0)\wedge(v4_cat_1 X0)\wedge(v5_cat_1 X0)\wedge(v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))\Rightarrow(\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0))\Rightarrow(\forall X2.(m1_subset_1 X2 (u1_struct_0 X0))\Rightarrow(\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0))\Rightarrow(\forall X4.(m1_cat_1 X4 X0 \\ & X1 X2)\Rightarrow(\forall X5.(m1_cat_1 X5 X0 X2 X3)\Rightarrow(\neg(k2_cat_1 X0 X1 X2\neq k1_xboole_0)\wedge \\ & ((k2_cat_1 X0 X2 X3\neq k1_xboole_0)\wedge(k5_cat_1 X0 X1 X2 X3 X4 X5\neq k1_cat_1 \\ & X0 X4 X5)))))))))) \end{aligned} \quad (7)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4.(m1_cat_1 X4 X0 \\ & X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X2 X3) \Rightarrow (\neg(k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge \\ & ((k2_cat_1 X0 X2 X3 \neq k1_xboole_0) \wedge (k7_oppcat_1 X0 X1 X3 (k5_cat_1 \\ & X0 X1 X2 X3 X4 X5) \neq k1_cat_1 (k2_oppcat_1 X0) (k7_oppcat_1 X0 X2 X3 \\ & X5) (k7_oppcat_1 X0 X1 X2 X4)))))))))) \end{aligned}$$