

t50_oppcat_1

(TMaD2CysrZdx6icHSUgZ8868TMGCaGFs9qa)

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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 $v1_cat.1 : \iota \Rightarrow o$ be given. Let $v1_funct.1 : \iota \Rightarrow o$ be given. Let $v1_funct.2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct.0 : \iota \Rightarrow \iota$ be given. Let $m1_subset.1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_zfmisc.1 : \iota \Rightarrow \iota$ be given. Let $k2_zfmisc.1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1_funct.2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_oppcat.1 : \iota \Rightarrow \iota$ be given. Let $k11_oppcat.1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_funct.4 : \iota \Rightarrow \iota$ be given. Let $v1_xboole.0 : \iota \Rightarrow o$ be given. Let $k1_oppcat.1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $g1_cat.1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l5_struct.0 : \iota \Rightarrow o$ be given. Let $l1_graph.1 : \iota \Rightarrow o$ be given. Let $u2_graph.1 : \iota \Rightarrow \iota$ be given. Let $u1_struct.0 : \iota \Rightarrow \iota$ be given. Let $u1_graph.1 : \iota \Rightarrow \iota$ be given. Let $u1_cat.1 : \iota \Rightarrow \iota$ be given. Let $k3_funct.2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_oppcat.1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((v1_funct.1 X3) \wedge \\ & (m1_subset.1 X3 (k1_zfmisc.1 (k2_zfmisc.1 (k2_zfmisc.1 X0 X1) \\ & X2)))) \Rightarrow (k2_funct.4 (k2_funct.4 X3) = X3) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & ((\neg v1_xboole.0 X1) \wedge (\neg v1_xboole.0 X3) \wedge ((v1_funct.1 X4) \wedge ((\\ & v1_funct.2 X4 X0 X1) \wedge (m1_subset.1 X4 (k1_zfmisc.1 (k2_zfmisc.1 \\ & X0 X1)))))) \wedge ((v1_funct.1 X5) \wedge ((v1_funct.2 X5 X2 X3) \wedge (m1_subset.1 \\ & X5 (k1_zfmisc.1 (k2_zfmisc.1 X2 X3)))))) \Rightarrow ((r1_funct.2 X0 X1 \\ & X2 X3 X4 X5) \Leftrightarrow (X4 = X5)) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1_xboole.0 X0) \wedge \\ & ((\neg v1_xboole.0 X1) \wedge (\neg v1_xboole.0 X2) \wedge ((v1_funct.1 X3) \wedge (m1_subset.1 \\ & X3 (k1_zfmisc.1 (k2_zfmisc.1 (k2_zfmisc.1 X0 X1) X2)))))) \Rightarrow (k1_oppcat.1 \\ & X0 X1 X2 X3 = k2_funct.4 X3) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((v1_funct_1 \\
& X2)\wedge((v1_funct_2 X2 X1 X0)\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\
& X1 X0))))\wedge(((v1_funct_1 X3)\wedge((v1_funct_2 X3 X1 X0)\wedge(m1_subset_1 \\
& X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0))))\wedge((v1_funct_1 X4)\wedge(m1_subset_1 \\
& X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1))))))\Rightarrow(\forall X5. \\
& \forall X6.\forall X7.\forall X8.\forall X9.(g1_cat_1 X0 X1 X2 \\
& X3 X4 = g1_cat_1 X5 X6 X7 X8 X9)\Rightarrow((X0 = X5)\wedge((X1 = X6)\wedge((X2 = X7)\wedge((X3 = \\
& X8)\wedge(X4 = X9))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\
& X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\
& X0)\wedge(l1_cat_1 X0))))))))\Rightarrow((\neg v2_struct_0 (k2_oppcat_1 X0))\wedge \\
& ((\neg v11_struct_0 (k2_oppcat_1 X0))\wedge((v1_cat_1 (k2_oppcat_1 X0))\wedge \\
& ((v2_cat_1 (k2_oppcat_1 X0))\wedge((v3_cat_1 (k2_oppcat_1 X0))\wedge(\\
& (v4_cat_1 (k2_oppcat_1 X0))\wedge((v5_cat_1 (k2_oppcat_1 X0))\wedge(v6_cat_1 \\
& (k2_oppcat_1 X0))))))))))
\end{aligned} \tag{5}$$

Assume the following.

$$\forall X0.(((\neg v11_struct_0 X0)\wedge(l5_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u4_struct_0 X0)) \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1_graph_1 X0)\Rightarrow((v1_funct_1 (u2_graph_1 X0))\wedge((\\
& v1_funct_2 (u2_graph_1 X0) (u4_struct_0 X0) (u1_struct_0 X0))\wedge \\
& (m1_subset_1 (u2_graph_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\
& X0) (u1_struct_0 X0))))))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1_graph_1 X0)\Rightarrow((v1_funct_1 (u1_graph_1 X0))\wedge((\\
& v1_funct_2 (u1_graph_1 X0) (u4_struct_0 X0) (u1_struct_0 X0))\wedge \\
& (m1_subset_1 (u1_graph_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\
& X0) (u1_struct_0 X0))))))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1_cat_1 X0)\Rightarrow((v1_funct_1 (u1_cat_1 X0))\wedge(m1_subset_1 \\
& (u1_cat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\
& X0) (u4_struct_0 X0)) (u4_struct_0 X0))))))
\end{aligned} \tag{9}$$

Assume the following.

$$\forall X0.(l1_graph_1 X0)\Rightarrow(l5_struct_0 X0) \tag{10}$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow (l1_graph_1 X0) \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1_xboole_0 X0) \wedge \\ & (((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X0 X1) \wedge (m1_subset_1 X2 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X0 X1)))))) \wedge (m1_subset_1 X3 X0))) \Rightarrow (m1_subset_1 (\\ & k3_funct_2 X0 X1 X2 X3) X1) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow ((\neg v2_struct_0 (k2_oppcat_1 X0)) \wedge \\ & ((\neg v11_struct_0 (k2_oppcat_1 X0)) \wedge ((v1_cat_1 (k2_oppcat_1 X0)) \wedge \\ & (l1_cat_1 (k2_oppcat_1 X0)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1_xboole_0 X0) \wedge \\ & ((\neg v1_xboole_0 X1) \wedge ((\neg v1_xboole_0 X2) \wedge ((v1_funct_1 X3) \wedge (m1_subset_1 \\ & X3 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X0 X1) X2)))))) \Rightarrow ((\\ & v1_funct_1 (k1_oppcat_1 X0 X1 X2 X3)) \wedge (m1_subset_1 (k1_oppcat_1 \\ & X0 X1 X2 X3) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X0) X2)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))) \wedge (((\neg v2_struct_0 X1) \wedge \\ & ((\neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \wedge ((v1_funct_1 \\ & X2) \wedge ((v1_funct_2 X2 (u4_struct_0 X0) (u4_struct_0 X1)) \wedge (m1_subset_1 \\ & X2 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 X1)))))) \Rightarrow \\ & ((v1_funct_1 (k11_oppcat_1 X0 X1 X2)) \wedge ((v1_funct_2 (k11_oppcat_1 \\ & X0 X1 X2) (u4_struct_0 X0) (u4_struct_0 (k2_oppcat_1 X1))) \wedge (m1_subset_1 \\ & (k11_oppcat_1 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\ & X0) (u4_struct_0 (k2_oppcat_1 X1)))))) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 \\ & X0)) \Rightarrow (k5_oppcat_1 X0 X1 = X1)) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (k2_oppcat_1 X0 = g1_cat_1 (u1_struct_0 \\ & X0) (u4_struct_0 X0) (u2_graph_1 X0) (u1_graph_1 X0) (k1_oppcat_1 \\ & (u4_struct_0 X0) (u4_struct_0 X0) (u4_struct_0 X0) (u1_cat_1 X0))) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\ & \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2. \\ & ((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (u4_struct_0 X0) (u4_struct_0 \\ & X1)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\ & X0) (u4_struct_0 X1)))))) \Rightarrow (\forall X3.((v1_funct_1 X3) \wedge ((v1_funct_2 \\ & X3 (u4_struct_0 X0) (u4_struct_0 (k2_oppcat_1 X1)) \wedge (m1_subset_1 \\ & X3 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 (k2_oppcat_1 \\ & X1)))))) \Rightarrow ((X3 = k11_oppcat_1 X0 X1 X2) \Leftrightarrow (\forall X4.(m1_subset_1 \\ & X4 (u4_struct_0 X0) \Rightarrow (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 \\ & (k2_oppcat_1 X1)) X3 X4 = k5_oppcat_1 X1 (k3_funct_2 (u4_struct_0 \\ & X0) (u4_struct_0 X1) X2 X4)))))) \end{aligned} \quad (18)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow ((v1_cat_1 X0) \Rightarrow (X0 = g1_cat_1 (u1_struct_0 X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 X0))) \quad (19)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\ & \neg v11_struct_0 X1) \wedge ((v1_cat_1 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 \\ & X1) \wedge ((v4_cat_1 X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 \\ & X1)))))))) \Rightarrow (\forall X2.((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (u4_struct_0 \\ & X0) (u4_struct_0 X1)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\ & (u4_struct_0 X0) (u4_struct_0 X1)))))) \Rightarrow (r1_funct_2 (u4_struct_0 \\ & X0) (u4_struct_0 (k2_oppcat_1 (k2_oppcat_1 X1))) (u4_struct_0 \\ & X0) (u4_struct_0 X1) (k11_oppcat_1 X0 (k2_oppcat_1 X1) (k11_oppcat_1 \\ & X0 X1 X2)) X2))) \end{aligned}$$