

l44_oppcat_1

(TML3KQAVgk2o1xRmd4KLki9goTSHuM4EaWQ)

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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 $k2_oppcat_1 : \iota \Rightarrow \iota$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k7_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ 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 $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_funct_4 : \iota \Rightarrow \iota$ be given. Let $g1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_cat_1 : \iota \Rightarrow o$ 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 $u1_graph_1 : \iota \Rightarrow \iota$ be given. Let $u1_cat_1 : \iota \Rightarrow \iota$ be given. Let $k5_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\
& \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
& X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
& (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 (u4_struct_0 X0)) \Rightarrow \\
& ((k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X1) (k7_cat_1 X0 X1 \\
& X2) (k3_graph_1 X0 X3) = k3_graph_1 X1 (k3_funct_2 (u4_struct_0 \\
& X0) (u4_struct_0 X1) X2 X3)) \wedge (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 \\
& X1) (k7_cat_1 X0 X1 X2) (k4_graph_1 X0 X3) = k4_graph_1 X1 (k3_funct_2 \\
& (u4_struct_0 X0) (u4_struct_0 X1) X2 X3))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\
& \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
& X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
& (m2_cat_1 X2 (k2_oppcat_1 X0) X1) \Rightarrow (\forall X3.(m1_subset_1 X3 \\
& (u1_struct_0 X0) \Rightarrow (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 \\
& X1) (k7_cat_1 X0 X1 (k9_oppcat_1 X0 X1 X2)) X3 = k3_funct_2 (u1_struct_0 \\
& (k2_oppcat_1 X0) (u1_struct_0 X1) (k7_cat_1 (k2_oppcat_1 X0) \\
& X1 X2) (k3_oppcat_1 X0 X3))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1_xboole_0 X0) \wedge \\
& (((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X0 X1) \wedge (m1_subset_1 X2 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X0 X1)))))) \wedge (m1_subset_1 X3 X0))) \Rightarrow (k3_funct_2 X0 \\
& X1 X2 X3 = k1_funct_1 X2 X3)
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1_xboole_0 X0) \wedge \\
& ((\neg v1_xboole_0 X1) \wedge ((\neg v1_xboole_0 X2) \wedge ((v1_funct_1 X3) \wedge (m1_subset_1 \\
& X3 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X0 X1) X2)))))) \Rightarrow (k1_oppcat_1 \\
& X0 X1 X2 X3 = k2_funct_4 X3)
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((v1_funct_1 \\
& X2) \wedge ((v1_funct_2 X2 X1 X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\
& X1 X0)))))) \wedge (((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 X0) \wedge (m1_subset_1 \\
& X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge ((v1_funct_1 X4) \wedge (m1_subset_1 \\
& X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1)))))) \Rightarrow (\forall X5. \\
& \forall X6.\forall X7.\forall X8.\forall X9.(g1_cat_1 X0 X1 X2 \\
& X3 X4 = g1_cat_1 X5 X6 X7 X8 X9) \Rightarrow ((X0 = X5) \wedge ((X1 = X6) \wedge ((X2 = X7) \wedge ((X3 = \\
& X8) \wedge (X4 = X9))))))
\end{aligned} \tag{5}$$

Assume the following.

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

Assume the following.

$$\forall X0.((\neg v11_struct_0 X0) \wedge (l5_struct_0 X0)) \Rightarrow (\neg v1_xboole_0 (u4_struct_0 X0)) \quad (7)$$

Assume the following.

$$\forall X0.(l1_graph_1 X0) \Rightarrow ((v1_funct_1 (u2_graph_1 X0)) \wedge ((v1_funct_2 (u2_graph_1 X0) (u4_struct_0 X0) (u1_struct_0 X0)) \wedge (m1_subset_1 (u2_graph_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u1_struct_0 X0)))))) \quad (8)$$

Assume the following.

$$\forall X0.(l1_graph_1 X0) \Rightarrow ((v1_funct_1 (u1_graph_1 X0)) \wedge ((v1_funct_2 (u1_graph_1 X0) (u4_struct_0 X0) (u1_struct_0 X0)) \wedge (m1_subset_1 (u1_graph_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u1_struct_0 X0)))))) \quad (9)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow ((v1_funct_1 (u1_cat_1 X0)) \wedge (m1_subset_1 (u1_cat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 X0)) (u4_struct_0 X0)))))) \quad (10)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))))) \wedge ((\neg v2_struct_0 X1) \wedge ((\neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))))) \Rightarrow (\forall X2.(m2_cat_1 X2 X0 X1) \Rightarrow ((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (u4_struct_0 X0) (u4_struct_0 X1)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 X1))))))) \quad (11)$$

Assume the following.

$$\forall X0.(l1_graph_1 X0) \Rightarrow (l5_struct_0 X0) \quad (12)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow (l1_graph_1 X0) \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))))) \wedge (m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (m1_subset_1 (k5_oppcat_1 X0 X1) (u4_struct_0 (k2_oppcat_1 X0))) \quad (14)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_graph_1 X0)))\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(m1_subset_1(k4_graph_1 X0 X1) (u1_struct_0 X0)) \quad (15)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_graph_1 X0)))\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(m1_subset_1(k3_graph_1 X0 X1) (u1_struct_0 X0)) \quad (16)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\Rightarrow((\neg v2_struct_0 (k2_oppcat_1 X0))\wedge((\neg v11_struct_0 (k2_oppcat_1 X0))\wedge((v1_cat_1 (k2_oppcat_1 X0))\wedge(l1_cat_1 (k2_oppcat_1 X0)))))) \quad (17)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.((\neg v2_struct_0 X1)\wedge((\neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 X1))))))))\Rightarrow(\forall X2.((v1_funct_1 X2)\wedge((v1_funct_2 X2 (u4_struct_0 (k2_oppcat_1 X0)) (u4_struct_0 X1))\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 (k2_oppcat_1 X0)) (u4_struct_0 X1))))))\Rightarrow(\forall X3.((v1_funct_1 X3)\wedge((v1_funct_2 X3 (u4_struct_0 X0) (u4_struct_0 X1))\wedge(m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 X1))))))\Rightarrow((X3 = k9_oppcat_1 X0 X1 X2)\Leftrightarrow(\forall X4.(m1_subset_1 X4 (u4_struct_0 X0))\Rightarrow(k3_funct_2 (u4_struct_0 X0) (u4_struct_0 X1) X3 X4 = k3_funct_2 (u4_struct_0 (k2_oppcat_1 X0) (u4_struct_0 X1) X2 (k5_oppcat_1 X0 X4)))))) \quad (18)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.(m1_subset_1 X1 (u4_struct_0 X0))\Rightarrow(k5_oppcat_1 X0 X1 = X1)) \quad (19)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_graph_1 X0)))\Rightarrow(\forall X1.(m1_subset_1 X1 (u4_struct_0 X0))\Rightarrow(k4_graph_1 X0 X1 = k3_funct_2 (u4_struct_0 X0) (u1_struct_0 X0) (u2_graph_1 X0 X1)) \quad (20)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_graph_1 \\ & X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (k3_graph_1 \\ & X0 X1 = k3_funct_2 (u4_struct_0 X0) (u1_struct_0 X0) (u1_graph_1 \\ & X0) X1)) \end{aligned} \quad (21)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (k3_oppcat_1 X0 X1 = X1)) \end{aligned} \quad (22)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (k2_oppcat_1 X0 = g1_cat_1 (u1_struct_0 \\ & X0) (u4_struct_0 X0) (u2_graph_1 X0) (u1_graph_1 X0) (k1_oppcat_1 \\ & (u4_struct_0 X0) (u4_struct_0 X0) (u4_struct_0 X0) (u1_cat_1 X0))) \end{aligned} \quad (23)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1_cat_1 X0) \Rightarrow ((v1_cat_1 X0) \Rightarrow (X0 = g1_cat_1 (u1_struct_0 \\ & X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 \\ & X0))) \end{aligned} \quad (24)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\ & \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2. \\ & (m2_cat_1 X2 (k2_oppcat_1 X0) X1) \Rightarrow (\forall X3.(m1_subset_1 X3 \\ & (u4_struct_0 X0)) \Rightarrow ((k3_funct_2 (u1_struct_0 X0) (u1_struct_0 \\ & X1) (k7_cat_1 X0 X1 (k9_oppcat_1 X0 X1 X2)) (k3_graph_1 X0 X3) = k4_graph_1 \\ & X1 (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 X1) (k9_oppcat_1 \\ & X0 X1 X2) X3)) \wedge (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X1) (k7_cat_1 \\ & X0 X1 (k9_oppcat_1 X0 X1 X2)) (k4_graph_1 X0 X3) = k3_graph_1 X1 (k3_funct_2 \\ & (u4_struct_0 X0) (u4_struct_0 X1) (k9_oppcat_1 X0 X1 X2) X3)))))) \end{aligned}$$