

t36_grcat_1
(TMbnrS43GiTDJzKW2pf24gmd2ggxiuqdD3k)

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Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $v1_classes2 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k25_grcat_1 : \iota \Rightarrow \iota$ be given. Let $m3_grcat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k18_grcat_1 : \iota \Rightarrow \iota$ be given. Let $k17_grcat_1 : \iota \Rightarrow \iota$ 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 $k19_grcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k20_grcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_tarski : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k24_grcat_1 : \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k13_grcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_cat_1 : \iota \Rightarrow \iota$ be given. Let $v4_grcat_1 : \iota \Rightarrow o$ be given. Let $v3_grcat_1 : \iota \Rightarrow o$ be given. Let $k8_grcat_1 : \iota \Rightarrow \iota$ be given. Let $k7_grcat_1 : \iota \Rightarrow \iota$ 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 $g1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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 $l1_cat_1 : \iota \Rightarrow o$ be given. Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $v1_cat_1 : \iota \Rightarrow o$ be given. Let $k23_grcat_1 : \iota \Rightarrow \iota$ be given. Let $k22_grcat_1 : \iota \Rightarrow \iota$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (\forall X1. \\ & (m1_subset_1 X1 (u4_struct_0 (k25_grcat_1 X0))) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u4_struct_0 (k25_grcat_1 X0))) \Rightarrow ((k4_tarski \\ & X2 X1 \in k9_xtuple_0 (u1_cat_1 (k25_grcat_1 X0))) \Leftrightarrow (k3_graph_1 (\\ & k25_grcat_1 X0) X2 = k4_graph_1 (k25_grcat_1 X0) X1)))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v1_xboole_0 X0) \wedge (v4_grcat_1 X0)) \Rightarrow (\forall X1. \\ & (m3_grcat_1 X1 X0) \Leftrightarrow (m1_subset_1 X1 X0)) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v1_xboole_0 X0) \wedge (v3_grcat_1 X0)) \wedge \\ & (m1_subset_1 X1 (k18_grcat_1 X0))) \Rightarrow (k20_grcat_1 X0 X1 = k8_grcat_1 \\ & X1) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v1_xboole_0 X0)\wedge(v3_grcat_1 X0))\wedge(m1_subset_1 X1 (k18_grcat_1 X0)))\Rightarrow(k19_grcat_1 X0 X1 = k7_grcat_1 X1) \quad (4)$$

Assume the following.

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

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v1_classes2 X0))\Rightarrow(v3_grcat_1 (k17_grcat_1 X0)) \quad (6)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v1_classes2 X0))\Rightarrow(\neg v1_xboole_0 (k17_grcat_1 X0)) \quad (7)$$

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.

$$\forall X0.(l1_cat_1 X0)\Rightarrow(l1_graph_1 X0) \quad (10)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v1_classes2 X0))\Rightarrow((\neg v2_struct_0 (k25_grcat_1 X0))\wedge((\neg v11_struct_0 (k25_grcat_1 X0))\wedge((v1_cat_1 (k25_grcat_1 X0))\wedge(l1_cat_1 (k25_grcat_1 X0)))))) \quad (11)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v3_grcat_1 X0)) \Rightarrow ((v1_funct_1 (k24_grcat_1 X0)) \wedge (m1_subset_1 (k24_grcat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (k18_grcat_1 X0) (k18_grcat_1 X0)) (k18_grcat_1 X0)))))) \quad (12)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v3_grcat_1 X0)) \Rightarrow ((v1_funct_1 (k23_grcat_1 X0)) \wedge ((v1_funct_2 (k23_grcat_1 X0) (k18_grcat_1 X0) X0) \wedge (m1_subset_1 (k23_grcat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k18_grcat_1 X0) X0)))))) \quad (13)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v3_grcat_1 X0)) \Rightarrow ((v1_funct_1 (k22_grcat_1 X0)) \wedge ((v1_funct_2 (k22_grcat_1 X0) (k18_grcat_1 X0) X0) \wedge (m1_subset_1 (k22_grcat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k18_grcat_1 X0) X0)))))) \quad (14)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v3_grcat_1 X0)) \Rightarrow ((\neg v1_xboole_0 (k18_grcat_1 X0)) \wedge (v4_grcat_1 (k18_grcat_1 X0))) \quad (15)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_graph_1 X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (k4_graph_1 X0 X1 = k3_funct_2 (u4_struct_0 X0) (u1_struct_0 X0) (u2_graph_1 X0) X1)) \quad (16)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_graph_1 X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (k3_graph_1 X0 X1 = k3_funct_2 (u4_struct_0 X0) (u1_struct_0 X0) (u1_graph_1 X0) X1)) \quad (17)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (k25_grcat_1 X0 = g1_cat_1 (k17_grcat_1 X0) (k18_grcat_1 (k17_grcat_1 X0)) (k22_grcat_1 (k17_grcat_1 X0)) (k23_grcat_1 (k17_grcat_1 X0)) (k24_grcat_1 (k17_grcat_1 X0))) \quad (18)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge (v3_grcat_1 X0)) \Rightarrow (\forall X1. \\
& ((v1_funct_1 X1) \wedge (m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (\\
& k2_zfmisc_1 (k18_grcat_1 X0) (k18_grcat_1 X0)) (k18_grcat_1 X0)))) \Rightarrow \\
& ((X1 = k24_grcat_1 X0) \Leftrightarrow ((\forall X2.(m3_grcat_1 X2 (k18_grcat_1 \\
& X0)) \Rightarrow (\forall X3.(m3_grcat_1 X3 (k18_grcat_1 X0)) \Rightarrow ((k4_tarski \\
& X2 X3 \in k9_xtuple_0 X1) \Leftrightarrow (k19_grcat_1 X0 X2 = k20_grcat_1 X0 X3)))) \wedge \\
& (\forall X2.(m3_grcat_1 X2 (k18_grcat_1 X0)) \Rightarrow (\forall X3.(m3_grcat_1 \\
& X3 (k18_grcat_1 X0)) \Rightarrow ((k4_tarski X2 X3 \in k9_xtuple_0 X1) \Rightarrow (k1_binop_1 \\
& X1 X2 X3 = k13_grcat_1 X2 X3))))))
\end{aligned} \tag{19}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge (v3_grcat_1 X0)) \Rightarrow (\forall X1. \\
& ((v1_funct_1 X1) \wedge ((v1_funct_2 X1 (k18_grcat_1 X0) X0) \wedge (m1_subset_1 \\
& X1 (k1_zfmisc_1 (k2_zfmisc_1 (k18_grcat_1 X0) X0)))) \Rightarrow ((X1 = k23_grcat_1 \\
& X0) \Leftrightarrow (\forall X2.(m3_grcat_1 X2 (k18_grcat_1 X0)) \Rightarrow (k3_funct_2 \\
& (k18_grcat_1 X0) X0 X1 X2 = k20_grcat_1 X0 X2))))
\end{aligned} \tag{20}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge (v3_grcat_1 X0)) \Rightarrow (\forall X1. \\
& ((v1_funct_1 X1) \wedge ((v1_funct_2 X1 (k18_grcat_1 X0) X0) \wedge (m1_subset_1 \\
& X1 (k1_zfmisc_1 (k2_zfmisc_1 (k18_grcat_1 X0) X0)))) \Rightarrow ((X1 = k22_grcat_1 \\
& X0) \Leftrightarrow (\forall X2.(m3_grcat_1 X2 (k18_grcat_1 X0)) \Rightarrow (k3_funct_2 \\
& (k18_grcat_1 X0) X0 X1 X2 = k19_grcat_1 X0 X2))))
\end{aligned} \tag{21}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1_cat_1 X0) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 \\
& X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k4_tarski \\
& X2 X1 \in k9_xtuple_0 (u1_cat_1 X0)) \Rightarrow (k1_cat_1 X0 X1 X2 = k1_binop_1 \\
& (u1_cat_1 X0) X2 X1))))
\end{aligned} \tag{22}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1_cat_1 X0) \Rightarrow ((v1_cat_1 X0) \Rightarrow (X0 = g1_cat_1 (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 \\
& X0)))
\end{aligned} \tag{23}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (\forall X1. \\
& (m1_subset_1 X1 (u4_struct_0 (k25_grcat_1 X0))) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u4_struct_0 (k25_grcat_1 X0))) \Rightarrow (\forall X3. \\
& (m3_grcat_1 X3 (k18_grcat_1 (k17_grcat_1 X0))) \Rightarrow (\forall X4. (\\
& m3_grcat_1 X4 (k18_grcat_1 (k17_grcat_1 X0))) \Rightarrow (((X1 = X3) \wedge (X2 = \\
& X4)) \Rightarrow (((k3_graph_1 (k25_grcat_1 X0) X2 = k4_graph_1 (k25_grcat_1 \\
& X0) X1) \Rightarrow (k19_grcat_1 (k17_grcat_1 X0) X4 = k20_grcat_1 (k17_grcat_1 \\
& X0) X3)) \wedge ((k19_grcat_1 (k17_grcat_1 X0) X4 = k20_grcat_1 (k17_grcat_1 \\
& X0) X3) \Rightarrow (k3_graph_1 (k25_grcat_1 X0) X2 = k4_graph_1 (k25_grcat_1 \\
& X0) X1)) \wedge ((k3_graph_1 (k25_grcat_1 X0) X2 = k4_graph_1 (k25_grcat_1 \\
& X0) X1) \Rightarrow (k4_tarski X4 X3 \in k9_xtuple_0 (k24_grcat_1 (k17_grcat_1 \\
& X0)))) \wedge ((k4_tarski X4 X3 \in k9_xtuple_0 (k24_grcat_1 (k17_grcat_1 \\
& X0))) \Rightarrow (k3_graph_1 (k25_grcat_1 X0) X2 = k4_graph_1 (k25_grcat_1 \\
& X0) X1)) \wedge ((k3_graph_1 (k25_grcat_1 X0) X2 = k4_graph_1 (k25_grcat_1 \\
& X0) X1) \Rightarrow (k1_cat_1 (k25_grcat_1 X0) X1 X2 = k13_grcat_1 X4 X3)) \wedge (\\
& ((k3_graph_1 (k25_grcat_1 X0) X1 = k3_graph_1 (k25_grcat_1 X0) \\
& X2) \Rightarrow (k19_grcat_1 (k17_grcat_1 X0) X3 = k19_grcat_1 (k17_grcat_1 \\
& X0) X4)) \wedge ((k19_grcat_1 (k17_grcat_1 X0) X3 = k19_grcat_1 (k17_grcat_1 \\
& X0) X4) \Rightarrow (k3_graph_1 (k25_grcat_1 X0) X1 = k3_graph_1 (k25_grcat_1 \\
& X0) X2)) \wedge ((k4_graph_1 (k25_grcat_1 X0) X1 = k4_graph_1 (k25_grcat_1 \\
& X0) X2) \Rightarrow (k20_grcat_1 (k17_grcat_1 X0) X3 = k20_grcat_1 (k17_grcat_1 \\
& X0) X4)) \wedge ((k20_grcat_1 (k17_grcat_1 X0) X3 = k20_grcat_1 (k17_grcat_1 \\
& X0) X4) \Rightarrow (k4_graph_1 (k25_grcat_1 X0) X1 = k4_graph_1 (k25_grcat_1 \\
& X0) X2)))))))))))))
\end{aligned}$$