

l58_ringcat1 (TMQxDRHzD- vUa7SVZCxb8P6ibgsjaSXQm5gT)

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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 $k17_ringcat1 : \iota \Rightarrow \iota$ 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 $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m3_ringcat1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k10_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k9_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k11_ringcat1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k12_ringcat1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_tarSKI : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_relset_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k16_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k6_ringcat1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $m2_ringcat1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2_ringcat1 : \iota \Rightarrow o$ be given. Let $v36_algstr_0 : \iota \Rightarrow o$ be given. Let $v3_ringcat1 : \iota \Rightarrow o$ be given. Let $l1_ringcat1 : \iota \Rightarrow o$ be given. Let $k1_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k2_ringcat1 : \iota \Rightarrow \iota$ be given. Let $v5_ringcat1 : \iota \Rightarrow o$ be given. Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ be given. Let $k1_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v4_ringcat1 : \iota \Rightarrow o$ 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 $g1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_cat_1 : \iota \Rightarrow o$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $k15_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k14_ringcat1 : \iota \Rightarrow \iota$ be given. Let $u1_graph_1 : \iota \Rightarrow \iota$ be given. Let

$u2_graph_1 : \iota \Rightarrow \iota$ be given. Let $u1_cat_1 : \iota \Rightarrow \iota$ 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 (k17_ringcat1 X0))) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u4_struct_0 (k17_ringcat1 X0))) \Rightarrow (\forall X3. \\
& (m3_ringcat1 X3 (k10_ringcat1 (k9_ringcat1 X0))) \Rightarrow (\forall X4. \\
& (m3_ringcat1 X4 (k10_ringcat1 (k9_ringcat1 X0)))) \Rightarrow (((X1 = X3) \wedge \\
(X2 = X4)) \Rightarrow (((k3_graph_1 (k17_ringcat1 X0) X2 = k4_graph_1 (k17_ringcat1 \\
X0) X1) \Rightarrow (k11_ringcat1 (k9_ringcat1 X0) X4 = k12_ringcat1 (k9_ringcat1 \\
X0) X3)) \wedge (((k11_ringcat1 (k9_ringcat1 X0) X4 = k12_ringcat1 (k9_ringcat1 \\
X0) X3) \Rightarrow (k3_graph_1 (k17_ringcat1 X0) X2 = k4_graph_1 (k17_ringcat1 \\
X0) X1)) \wedge (((k3_graph_1 (k17_ringcat1 X0) X2 = k4_graph_1 (k17_ringcat1 \\
X0) X1) \Rightarrow (k4_tarski X4 X3 \in k1_relset_1 (k2_zfmisc_1 (k10_ringcat1 \\
(k9_ringcat1 X0)) (k10_ringcat1 (k9_ringcat1 X0))) (k16_ringcat1 \\
(k9_ringcat1 X0)))) \wedge (((k4_tarski X4 X3 \in k1_relset_1 (k2_zfmisc_1 \\
(k10_ringcat1 (k9_ringcat1 X0)) (k10_ringcat1 (k9_ringcat1 X0))) \\
(k16_ringcat1 (k9_ringcat1 X0)))) \Rightarrow (k3_graph_1 (k17_ringcat1 \\
X0) X2 = k4_graph_1 (k17_ringcat1 X0) X1)) \wedge (((k3_graph_1 (k17_ringcat1 \\
X0) X2 = k4_graph_1 (k17_ringcat1 X0) X1) \Rightarrow (k1_cat_1 (k17_ringcat1 \\
X0) X1 X2 = k6_ringcat1 X4 X3)) \wedge (((k3_graph_1 (k17_ringcat1 X0) \\
X1 = k3_graph_1 (k17_ringcat1 X0) X2) \Rightarrow (k11_ringcat1 (k9_ringcat1 \\
X0) X3 = k11_ringcat1 (k9_ringcat1 X0) X4)) \wedge (((k11_ringcat1 (k9_ringcat1 \\
X0) X3 = k11_ringcat1 (k9_ringcat1 X0) X4) \Rightarrow (k3_graph_1 (k17_ringcat1 \\
X0) X1 = k3_graph_1 (k17_ringcat1 X0) X2)) \wedge (((k4_graph_1 (k17_ringcat1 \\
X0) X1 = k4_graph_1 (k17_ringcat1 X0) X2) \Rightarrow (k12_ringcat1 (k9_ringcat1 \\
X0) X3 = k12_ringcat1 (k9_ringcat1 X0) X4)) \wedge (((k12_ringcat1 (k9_ringcat1 \\
X0) X3 = k12_ringcat1 (k9_ringcat1 X0) X4) \Rightarrow (k4_graph_1 (k17_ringcat1 \\
X0) X1 = k4_graph_1 (k17_ringcat1 X0) X2))))))))))))))))) \\
& \tag{1}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (\forall X1. \\
& (m1_subset_1 X1 (u4_struct_0 (k17_ringcat1 X0))) \Rightarrow (\forall X2. \\
& (m3_ringcat1 X2 (k10_ringcat1 (k9_ringcat1 X0))) \Rightarrow (\forall X3. \\
& (m1_subset_1 X3 (u1_struct_0 (k17_ringcat1 X0))) \Rightarrow (\forall X4. \\
& (m2_ringcat1 X4 (k9_ringcat1 X0)) \Rightarrow (((v2_ringcat1 X1) \wedge (m3_ringcat1 \\
X1 (k10_ringcat1 (k9_ringcat1 X0)))) \wedge ((m1_subset_1 X2 (u4_struct_0 \\
(k17_ringcat1 X0))) \wedge (((v36_algstr_0 X3) \wedge (m2_ringcat1 X3 (k9_ringcat1 \\
X0))) \wedge (m1_subset_1 X4 (u1_struct_0 (k17_ringcat1 X0)))))))))) \\
& \tag{2}
\end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall X0.((v2_ringcat1\ X0)\wedge((v3_ringcat1\ X0)\wedge(l1_ringcat1 \\ & X0)))\Rightarrow(\forall X1.((v2_ringcat1\ X1)\wedge((v3_ringcat1\ X1)\wedge(l1_ringcat1 \\ & X1)))\Rightarrow(\forall X2.((v2_ringcat1\ X2)\wedge((v3_ringcat1\ X2)\wedge(l1_ringcat1 \\ & X2))))\Rightarrow(((k1_ringcat1\ X2 = k2_ringcat1\ X1)\wedge(k1_ringcat1\ X1 = k2_ringcat1 \\ & X0))\Rightarrow(k6_ringcat1\ X2\ (k6_ringcat1\ X1\ X0) = k6_ringcat1\ (k6_ringcat1 \\ & X2\ X1)\ X0)))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0\ X0)\wedge(v5_ringcat1\ X0))\Rightarrow(\forall X1. \quad (4)$$

$$(m3_ringcat1\ X1\ X0)\Leftrightarrow(m1_subset_1\ X1\ X0))$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0\ X0)\wedge((\neg v11_struct_0\ X0)\wedge \\ & (l1_graph_1\ X0)))\wedge(m1_subset_1\ X1\ (u4_struct_0\ X0)))\Rightarrow(k3_graph_1 \\ & X0\ X1 = k1_graph_1\ X0\ X1) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v1_xboole_0\ X0)\wedge(v4_ringcat1\ X0))\wedge \\ & (m1_subset_1\ X1\ (k10_ringcat1\ X0)))\Rightarrow(k12_ringcat1\ X0\ X1 = k2_ringcat1 \\ & X1) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v1_xboole_0\ X0)\wedge(v4_ringcat1\ X0))\wedge \\ & (m1_subset_1\ X1\ (k10_ringcat1\ X0)))\Rightarrow(k11_ringcat1\ X0\ X1 = k1_ringcat1 \\ & X1) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v1_xboole_0\ X0)\wedge(v1_classes2\ X0))\Rightarrow(\forall X1. \\ & (m1_subset_1\ X1\ (u4_struct_0\ (k17_ringcat1\ X0)))\Rightarrow(\forall X2. \\ & (m1_subset_1\ X2\ (u4_struct_0\ (k17_ringcat1\ X0)))\Rightarrow((k3_graph_1 \\ & (k17_ringcat1\ X0)\ X2 = k4_graph_1\ (k17_ringcat1\ X0)\ X1)\Rightarrow((k3_graph_1 \\ & (k17_ringcat1\ X0)\ (k1_cat_1\ (k17_ringcat1\ X0)\ X1\ X2) = k3_graph_1 \\ & (k17_ringcat1\ X0)\ X1)\wedge(k4_graph_1\ (k17_ringcat1\ X0)\ (k1_cat_1 \\ & (k17_ringcat1\ X0)\ X1\ X2) = k4_graph_1\ (k17_ringcat1\ X0)\ X2)))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((v1_funct_1 \\
& X2)\wedge((v1_funct_2 X2 X1 X0)\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\
& X1 X0))))\wedge(((v1_funct_1 X3)\wedge((v1_funct_2 X3 X1 X0)\wedge(m1_subset_1 \\
& X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0))))\wedge((v1_funct_1 X4)\wedge(m1_subset_1 \\
& X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1))))))\Rightarrow(\forall X5. \\
& \forall X6.\forall X7.\forall X8.\forall X9.(g1_cat_1 X0 X1 X2 \\
& X3 X4 = g1_cat_1 X5 X6 X7 X8 X9)\Rightarrow((X0 = X5)\wedge((X1 = X6)\wedge((X2 = X7)\wedge((X3 = \\
& X8)\wedge(X4 = X9))))))
\end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0)\wedge(v1_classes2 X0))\Rightarrow((\neg v2_struct_0 \\
& (k17_ringcat1 X0))\wedge((\neg v11_struct_0 (k17_ringcat1 X0))\wedge(v1_cat_1 \\
& (k17_ringcat1 X0))))
\end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0)\wedge(v1_classes2 X0))\Rightarrow(v4_ringcat1 \\
& (k9_ringcat1 X0))
\end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0)\wedge(v1_classes2 X0))\Rightarrow(\neg v1_xboole_0 \\
& (k9_ringcat1 X0))
\end{aligned} \tag{12}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0)\wedge(v5_ringcat1 X0))\Rightarrow(\exists X1. \\
& m3_ringcat1 X1 X0)
\end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0)\wedge(v4_ringcat1 X0))\Rightarrow(\exists X1. \\
& m2_ringcat1 X1 X0)
\end{aligned} \tag{14}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0)\wedge(v5_ringcat1 X0))\Rightarrow(\forall X1. \\
& (m3_ringcat1 X1 X0)\Rightarrow((v3_ringcat1 X1)\wedge(l1_ringcat1 X1)))
\end{aligned} \tag{15}$$

Assume the following.

$$\forall X0.(l1_cat_1 X0)\Rightarrow(l1_graph_1 X0) \tag{16}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.((l1_graph_1 X0)\wedge(m1_subset_1 X1 (u4_struct_0 \\
& X0)))\Rightarrow(m1_subset_1 (k1_graph_1 X0 X1) (u1_struct_0 X0))
\end{aligned} \tag{17}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((l1_cat_1 X0)\wedge((m1_subset_1 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (u4_struct_0 X0))))\Rightarrow(m1_subset_1 (k1_cat_1 X0 X1 X2) (u4_struct_0 X0)) \quad (18)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v1_classes2 X0))\Rightarrow(l1_cat_1 (k17_ringcat1 X0)) \quad (19)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v4_ringcat1 X0))\Rightarrow((v1_funct_1 (k16_ringcat1 X0))\wedge(m1_subset_1 (k16_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) (k10_ringcat1 X0)) (k10_ringcat1 X0)))))) \quad (20)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v4_ringcat1 X0))\Rightarrow((v1_funct_1 (k15_ringcat1 X0))\wedge((v1_funct_2 (k15_ringcat1 X0) (k10_ringcat1 X0) X0)\wedge(m1_subset_1 (k15_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) X0)))))) \quad (21)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v4_ringcat1 X0))\Rightarrow((v1_funct_1 (k14_ringcat1 X0))\wedge((v1_funct_2 (k14_ringcat1 X0) (k10_ringcat1 X0) X0)\wedge(m1_subset_1 (k14_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) X0)))))) \quad (22)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v4_ringcat1 X0))\Rightarrow((\neg v1_xboole_0 (k10_ringcat1 X0))\wedge(v5_ringcat1 (k10_ringcat1 X0))) \quad (23)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0)\wedge(v1_classes2 X0))\Rightarrow(k17_ringcat1 X0 = g1_cat_1 (k9_ringcat1 X0) (k10_ringcat1 (k9_ringcat1 X0)) (k14_ringcat1 (k9_ringcat1 X0)) (k15_ringcat1 (k9_ringcat1 X0)) (k16_ringcat1 (k9_ringcat1 X0))) \quad (24)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0)\Rightarrow((v1_cat_1 X0)\Rightarrow(X0 = g1_cat_1 (u1_struct_0 X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 X0))) \quad (25)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (\forall X1. \\ & (m1_subset_1 X1 (u4_struct_0 (k17_ringcat1 X0))) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u4_struct_0 (k17_ringcat1 X0))) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u4_struct_0 (k17_ringcat1 X0)))) \Rightarrow (((k3_graph_1 \\ & (k17_ringcat1 X0) X3 = k4_graph_1 (k17_ringcat1 X0) X2) \wedge (k3_graph_1 \\ & (k17_ringcat1 X0) X2 = k4_graph_1 (k17_ringcat1 X0) X1)) \Rightarrow (k1_cat_1 \\ & (k17_ringcat1 X0) (k1_cat_1 (k17_ringcat1 X0) X1 X2) X3 = k1_cat_1 \\ & (k17_ringcat1 X0) X1 (k1_cat_1 (k17_ringcat1 X0) X2 X3)))))) \end{aligned}$$