

l57_ringcat1 (TMJHncza- vjLPi3mUJWJn19SeGHQhK2hJHEf)

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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 $v2_ringcat1 : \iota \Rightarrow o$ 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 $k6_ringcat1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $k1_reset_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k16_ringcat1 : \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $m2_ringcat1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v36_algstr_0 : \iota \Rightarrow o$ be given. Let $v4_ringcat1 : \iota \Rightarrow o$ be given. Let $v5_ringcat1 : \iota \Rightarrow o$ 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 $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $v1_cat_1 : \iota \Rightarrow o$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ 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.

$$\begin{aligned} & \forall X0.((v2_ringcat1 X0) \wedge ((v3_ringcat1 X0) \wedge (l1_ringcat1 \\ & X0))) \Rightarrow (\forall X1.((v2_ringcat1 X1) \wedge ((v3_ringcat1 X1) \wedge (l1_ringcat1 \\ & X1))) \Rightarrow ((k1_ringcat1 X1 = k2_ringcat1 X0) \Rightarrow ((k1_ringcat1 (k6_ringcat1 \\ & X1 X0) = k1_ringcat1 X0) \wedge (k2_ringcat1 (k6_ringcat1 X1 X0) = k2_ringcat1 \\ & X1)))) \end{aligned} \tag{1}$$

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)))))))))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (\forall X1. \\
& (m1_subset_1 X1 (u4_struct_0 (k17_ringcat1 X0))) \Rightarrow (\forall X2. \\
& (m3_ringcat1 X2 (k10_ringcat1 (k9_ringcat1 X0))) \Rightarrow (\forall X3. \\
& (m1_subset_1 X3 (u1_struct_0 (k17_ringcat1 X0))) \Rightarrow (\forall X4. \\
& (m2_ringcat1 X4 (k9_ringcat1 X0)) \Rightarrow (((v2_ringcat1 X1) \wedge (m3_ringcat1 \\
& X1 (k10_ringcat1 (k9_ringcat1 X0)))) \wedge ((m1_subset_1 X2 (u4_struct_0 \\
& (k17_ringcat1 X0))) \wedge (((v36_algstr_0 X3) \wedge (m2_ringcat1 X3 (k9_ringcat1 \\
& X0))) \wedge (m1_subset_1 X4 (u1_struct_0 (k17_ringcat1 X0))))))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow (\forall X1. \\
& (m3_ringcat1 X1 (k10_ringcat1 X0)) \Rightarrow (\forall X2. (m3_ringcat1 \\
& X2 (k10_ringcat1 X0)) \Rightarrow ((k11_ringcat1 X0 X1 = k12_ringcat1 X0 X2) \Rightarrow \\
& (k6_ringcat1 X1 X2 \in k10_ringcat1 X0)))
\end{aligned} \tag{4}$$

Assume the following.

$$\forall X0.\forall X1.(X0 \in X1) \Rightarrow (m1_subset_1 X0 X1) \quad (5)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v5_ringcat1 X0)) \Rightarrow (\forall X1. (m3_ringcat1 X1 X0) \Leftrightarrow (m1_subset_1 X1 X0)) \quad (6)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow (\forall X1. (m2_ringcat1 X1 X0) \Leftrightarrow (m1_subset_1 X1 X0)) \quad (7)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \wedge (m1_subset_1 X1 (k10_ringcat1 X0))) \Rightarrow (k12_ringcat1 X0 X1 = k2_ringcat1 X1) \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \wedge (m1_subset_1 X1 (k10_ringcat1 X0))) \Rightarrow (k11_ringcat1 X0 X1 = k1_ringcat1 X1) \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X1 X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge (((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 X0) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge ((v1_funct_1 X4) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1)))))) \Rightarrow (\forall X5. \\ & X3 X4 = g1_cat_1 X5 X6 X7 X8 X9) \Rightarrow ((X0 = X5) \wedge ((X1 = X6) \wedge ((X2 = X7) \wedge ((X3 = X8) \wedge (X4 = X9)))))) \end{aligned} \quad (10)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow ((\neg v2_struct_0 (k17_ringcat1 X0)) \wedge ((\neg v11_struct_0 (k17_ringcat1 X0)) \wedge (v1_cat_1 (k17_ringcat1 X0)))) \quad (11)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (v4_ringcat1 (k9_ringcat1 X0)) \quad (12)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (\neg v1_xboole_0 (k9_ringcat1 X0)) \quad (13)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v5_ringcat1 X0)) \Rightarrow (\exists X1. m3_ringcat1 X1 X0) \quad (14)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow (\exists X1. m2_ringcat1 X1 X0) \quad (15)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v5_ringcat1 X0)) \Rightarrow (\forall X1. (m3_ringcat1 X1 X0) \Rightarrow ((v3_ringcat1 X1) \wedge (l1_ringcat1 X1))) \quad (16)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (l1_cat_1 (k17_ringcat1 X0)) \quad (17)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow ((v1_funct_1 (k16_ringcat1 X0)) \wedge (m1_subset_1 (k16_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) (k10_ringcat1 X0)) (k10_ringcat1 X0)))))) \quad (18)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow ((v1_funct_1 (k15_ringcat1 X0)) \wedge ((v1_funct_2 (k15_ringcat1 X0) (k10_ringcat1 X0) X0) \wedge (m1_subset_1 (k15_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) X0)))))) \quad (19)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow ((v1_funct_1 (k14_ringcat1 X0)) \wedge ((v1_funct_2 (k14_ringcat1 X0) (k10_ringcat1 X0) X0) \wedge (m1_subset_1 (k14_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) X0)))))) \quad (20)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow ((\neg v1_xboole_0 (k10_ringcat1 X0)) \wedge (v5_ringcat1 (k10_ringcat1 X0))) \quad (21)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (k17_ringcat1 X0 = g1_cat_1 (k9_ringcat1 X0) (k10_ringcat1 (k9_ringcat1 X0)) (k14_ringcat1 (k9_ringcat1 X0)) (k15_ringcat1 (k9_ringcat1 X0)) (k16_ringcat1 (k9_ringcat1 X0))) \quad (22)$$

Assume the following.

$$\forall X0. (l1_cat_1 X0) \Rightarrow ((v1_cat_1 X0) \Rightarrow (X0 = g1_cat_1 (u1_struct_0 X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 X0))) \quad (23)$$

Theorem 1

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