

t21_ringcat1

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October 27, 2020

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 $k4_tarski : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $u1_cat_1 : \iota \Rightarrow \iota$ 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 $v5_ringcat1 : \iota \Rightarrow o$ be given. Let $m3_ringcat1 : \iota \Rightarrow \iota \Rightarrow o$ 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 $v4_ringcat1 : \iota \Rightarrow o$ be given. Let $k9_ringcat1 : \iota \Rightarrow \iota$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ be given. Let $k16_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k10_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k15_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k14_ringcat1 : \iota \Rightarrow \iota$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u2_graph_1 : \iota \Rightarrow \iota$ be given. Let $u1_graph_1 : \iota \Rightarrow \iota$ be given. Let $k11_ringcat1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k12_ringcat1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_ringcat1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} \forall X0.((\neg v1_xboole_0 X0) \wedge (v5_ringcat1 X0)) \Rightarrow (\forall X1. \\ (m3_ringcat1 X1 X0) \Leftrightarrow (m1_subset_1 X1 X0)) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. (((v1_funct_1 \\ X2) \wedge ((v1_funct_2 X2 X1 X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\ X1 X0)))))) \wedge (((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 X0) \wedge (m1_subset_1 \\ X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge ((v1_funct_1 X4) \wedge (m1_subset_1 \\ X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1)))))) \Rightarrow (\forall X5. \\ \forall X6. \forall X7. \forall X8. \forall X9. (g1_cat_1 X0 X1 X2 \\ X3 X4 = g1_cat_1 X5 X6 X7 X8 X9) \Rightarrow ((X0 = X5) \wedge ((X1 = X6) \wedge ((X2 = X7) \wedge ((X3 = \\ X8) \wedge (X4 = X9)))))) \end{aligned} \quad (2)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow ((\neg v2_struct_0 (k17_ringcat1 X0)) \wedge ((\neg v11_struct_0 (k17_ringcat1 X0)) \wedge (v1_cat_1 (k17_ringcat1 X0)))) \quad (3)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (v4_ringcat1 (k9_ringcat1 X0)) \quad (4)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (\neg v1_xboole_0 (k9_ringcat1 X0)) \quad (5)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow ((v1_funct_1 (u1_cat_1 X0)) \wedge (m1_subset_1 (u1_cat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 X0)) (u4_struct_0 X0)))))) \quad (6)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow (l1_graph_1 X0) \quad (7)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (l1_cat_1 (k17_ringcat1 X0)) \quad (8)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow ((v1_funct_1 (k16_ringcat1 X0)) \wedge (m1_subset_1 (k16_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) (k10_ringcat1 X0)) (k10_ringcat1 X0)) (k10_ringcat1 X0)))) \quad (9)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow ((v1_funct_1 (k15_ringcat1 X0)) \wedge ((v1_funct_2 (k15_ringcat1 X0) (k10_ringcat1 X0) X0) \wedge (m1_subset_1 (k15_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) X0)))))) \quad (10)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow ((v1_funct_1 (k14_ringcat1 X0)) \wedge ((v1_funct_2 (k14_ringcat1 X0) (k10_ringcat1 X0) X0) \wedge (m1_subset_1 (k14_ringcat1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) X0)))))) \quad (11)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow ((\neg v1_xboole_0 (k10_ringcat1 X0)) \wedge (v5_ringcat1 (k10_ringcat1 X0))) \quad (12)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_graph_1 X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (k4_graph_1 X0 X1 = k3_funct_2 (u4_struct_0 X0) (u1_struct_0 X0) (u2_graph_1 X0) X1)) \quad (13)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_graph_1 X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (k3_graph_1 X0 X1 = k3_funct_2 (u4_struct_0 X0) (u1_struct_0 X0) (u1_graph_1 X0) X1)) \quad (14)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (k17_ringcat1 X0 = g1_cat_1 (k9_ringcat1 X0) (k10_ringcat1 (k9_ringcat1 X0)) (k14_ringcat1 (k9_ringcat1 X0)) (k15_ringcat1 (k9_ringcat1 X0)) (k16_ringcat1 (k9_ringcat1 X0))) \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow (\forall X1. \\ & ((v1_funct_1 X1) \wedge (m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) (k10_ringcat1 X0)) (k10_ringcat1 X0)))) \Rightarrow ((X1 = k16_ringcat1 X0) \Leftrightarrow ((\forall X2.(m3_ringcat1 X2 (k10_ringcat1 X0)) \Rightarrow (\forall X3.(m3_ringcat1 X3 (k10_ringcat1 X0)) \Rightarrow ((k4_tarski X2 X3 \in k1_relset_1 (k2_zfmisc_1 (k10_ringcat1 X0) (k10_ringcat1 X0)) X1) \Leftrightarrow (k11_ringcat1 X0 X2 = k12_ringcat1 X0 X3)))) \wedge (\forall X2.(m3_ringcat1 X2 (k10_ringcat1 X0)) \Rightarrow (\forall X3. \\ & (m3_ringcat1 X3 (k10_ringcat1 X0)) \Rightarrow ((k4_tarski X2 X3 \in k1_relset_1 (k2_zfmisc_1 (k10_ringcat1 X0) (k10_ringcat1 X0)) X1) \Rightarrow (k1_binop_1 X1 X2 X3 = k6_ringcat1 X2 X3)))))) \end{aligned} \quad (16)$$

Assume the following.

$$\forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow (\forall X1. ((v1_funct_1 X1) \wedge ((v1_funct_2 X1 (k10_ringcat1 X0) X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) X0)))) \Rightarrow ((X1 = k15_ringcat1 X0) \Leftrightarrow (\forall X2.(m3_ringcat1 X2 (k10_ringcat1 X0)) \Rightarrow (k3_funct_2 (k10_ringcat1 X0) X0 X1 X2 = k12_ringcat1 X0 X2)))) \quad (17)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge (v4_ringcat1 X0)) \Rightarrow (\forall X1. \\
& ((v1_funct_1 X1) \wedge ((v1_funct_2 X1 (k10_ringcat1 X0) X0) \wedge (m1_subset_1 \\
& X1 (k1_zfmisc_1 (k2_zfmisc_1 (k10_ringcat1 X0) X0)))))) \Rightarrow ((X1 = \\
& k14_ringcat1 X0) \Leftrightarrow (\forall X2.(m3_ringcat1 X2 (k10_ringcat1 X0)) \Rightarrow \\
& (k3_funct_2 (k10_ringcat1 X0) X0 X1 X2 = k11_ringcat1 X0 X2)))
\end{aligned} \tag{18}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1_cat_1 X0) \Rightarrow ((v1_cat_1 X0) \Rightarrow (X0 = g1_cat_1 (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 \\
& X0)))
\end{aligned} \tag{19}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge (v1_classes2 X0)) \Rightarrow (\forall X1. \\
& (m1_subset_1 X1 (u4_struct_0 (k17_ringcat1 X0))) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u4_struct_0 (k17_ringcat1 X0))) \Rightarrow ((k4_tarski \\
& X2 X1 \in k1_relset_1 (k2_zfmisc_1 (u4_struct_0 (k17_ringcat1 X0)) \\
& (u4_struct_0 (k17_ringcat1 X0))) (u1_cat_1 (k17_ringcat1 X0))) \Leftrightarrow \\
& (k3_graph_1 (k17_ringcat1 X0) X2 = k4_graph_1 (k17_ringcat1 X0) \\
& X1))))
\end{aligned}$$