

t11_cat_1 (TMVWr-
TiM4cEtMmpaYUe97P4ayLMLHRrtAtn)

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Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ 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 $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $g1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_tarski : \iota \Rightarrow \iota$ be given. Let $v1_cat_1 : \iota \Rightarrow o$ be given. Let $v2_cat_1 : \iota \Rightarrow o$ be given. Let $v7_struct_0 : \iota \Rightarrow o$ be given. Let $v15_struct_0 : \iota \Rightarrow o$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $k18_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k17_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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. Assume the following.

$$\forall X0. \forall X1. (m1_subset_1 X0 X1) \Rightarrow ((v1_xboole_0 X1) \vee (X0 \in X1)) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge (l1_graph_1 X0))) \wedge (m1_subset_1 X1 (u4_struct_0 X0))) \Rightarrow (k3_graph_1 X0 X1 = k1_graph_1 X0 X1) \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. (((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X1 X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge (((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 X0) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge ((v1_funct_1 X4) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1)))))) \Rightarrow (\forall X5. \\ & \forall X6. \forall X7. \forall X8. \forall X9. (g1_cat_1 X0 X1 X2 X3 X4 = g1_cat_1 X5 X6 X7 X8 X9) \Rightarrow ((X0 = X5) \wedge ((X1 = X6) \wedge ((X2 = X7) \wedge ((X3 = X8) \wedge (X4 = X9)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0. \neg v1_xboole_0 (k1_tarski X0) \quad (4)$$

Assume the following.

$$\forall X0. \forall X1. (v1_cat_1 (k3_cat_1 X0 X1)) \wedge (v2_cat_1 (k3_cat_1 X0 X1)) \quad (5)$$

Assume the following.

$$\forall X0. \forall X1. (\neg v2_struct_0 (k3_cat_1 X0 X1)) \wedge ((v7_struct_0 (k3_cat_1 X0 X1)) \wedge (\neg v11_struct_0 (k3_cat_1 X0 X1)) \wedge ((v15_struct_0 (k3_cat_1 X0 X1)) \wedge (v1_cat_1 (k3_cat_1 X0 X1)))) \quad (6)$$

Assume the following.

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

Assume the following.

$$\forall X0. \forall X1. (v1_cat_1 (k3_cat_1 X0 X1)) \wedge (l1_cat_1 (k3_cat_1 X0 X1)) \quad (8)$$

Assume the following.

$$\forall X0. \forall X1. ((l1_graph_1 X0) \wedge (m1_subset_1 X1 (u4_struct_0 X0))) \Rightarrow (m1_subset_1 (k1_graph_1 X0 X1) (u1_struct_0 X0)) \quad (9)$$

Assume the following.

$$\forall X0. \forall X1. (v1_funct_1 (k18_funcop_1 X0 X1)) \wedge ((v1_funct_2 (k18_funcop_1 X0 X1) (k1_tarski X0) (k1_tarski X1)) \wedge (m1_subset_1 (k18_funcop_1 X0 X1) (k1_zfmisc_1 (k2_zfmisc_1 (k1_tarski X0) (k1_tarski X1)))))) \quad (10)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. (v1_funct_1 (k17_funcop_1 X0 X1 X2)) \wedge ((v1_funct_2 (k17_funcop_1 X0 X1 X2) (k2_zfmisc_1 (k1_tarski X0) (k1_tarski X1)) (k1_tarski X2)) \wedge (m1_subset_1 (k17_funcop_1 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (k1_tarski X0) (k1_tarski X1)) (k1_tarski X2)))))) \quad (11)$$

Assume the following.

$$\forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_graph_1 X0))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (k4_graph_1 X0 X1 = k3_funct_2 (u4_struct_0 X0) (u1_struct_0 X0) (u2_graph_1 X0 X1))) \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\ & X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k2_cat_1 X0 X1 X2 = ReplSep (\\ & toset (\lambda X3 : \iota.m1_subset_1 X3 (u4_struct_0 X0))) (\lambda X3 : \iota. \\ & \iota.(k3_graph_1 X0 X3 = X1) \wedge (k4_graph_1 X0 X3 = X2)) (\lambda X3 : \iota. \\ & X3)))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_graph_1 \\ & X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (k3_graph_1 \\ & X0 X1 = k3_funct_2 (u4_struct_0 X0) (u1_struct_0 X0) (u1_graph_1 \\ & X0) X1)) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0. \forall X1. (X1 = k1_tarski X0) \Leftrightarrow (\forall X2. (X2 \in X1) \Leftrightarrow (X2 = X0)) \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. k3_cat_1 X0 X1 = g1_cat_1 (k1_tarski X0) (\\ & k1_tarski X1) (k18_funcop_1 X1 X0) (k18_funcop_1 X1 X0) (k17_funcop_1 \\ & X1 X1 X1) \end{aligned} \quad (16)$$

Assume the following.

$$\forall X0. (l1_cat_1 X0) \Rightarrow ((v1_cat_1 X0) \Rightarrow (X0 = g1_cat_1 (u1_struct_0 X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 X0))) \quad (17)$$

Theorem 1

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (m1_subset_1 X2 (u1_struct_0 \\ & (k3_cat_1 X0 X1))) \Rightarrow (\forall X3. (m1_subset_1 X3 (u1_struct_0 (\\ & k3_cat_1 X0 X1))) \Rightarrow (\forall X4. (m1_subset_1 X4 (u4_struct_0 (k3_cat_1 \\ & X0 X1))) \Rightarrow (X4 \in k2_cat_1 (k3_cat_1 X0 X1) X2 X3))) \end{aligned}$$