

t5_nattra_1

(TMZ4vt9Hzm5GpSVP25bFxrGrB7u8Kbi5kC)

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Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $v2_cat_1 : \iota \Rightarrow o$ be given. Let $v3_cat_1 : \iota \Rightarrow o$ be given. Let $v4_cat_1 : \iota \Rightarrow o$ be given. Let $v5_cat_1 : \iota \Rightarrow o$ be given. Let $v6_cat_1 : \iota \Rightarrow o$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k10_cat_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_cat_2 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_cat_1 : \iota \Rightarrow \iota$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_tarski : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_tarski : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_tarski : \iota \Rightarrow \iota$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 \\ & X0 X2 = X1) \Rightarrow (k1_cat_1 X0 (k4_cat_1 X0 X1) X2 = X2)))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u4_struct_0 \\ & X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 \\ & X0 X1 = k4_graph_1 X0 X2) \Rightarrow (k1_cat_1 X0 X2 X1 = k1_binop_1 (u1_cat_1 \\ & X0) X1 X2)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 \\ & X0 X1 = k4_graph_1 X0 X2) \Leftrightarrow (k4_tarski X1 X2 \in k9_xtuple_0 (u1_cat_1 \\ & X0)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2_struct_0 \\ & X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 \\ & X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0))))))) \wedge (((\\ & \neg v2_struct_0 X1) \wedge ((\neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 \\ & X1) \wedge ((v4_cat_1 X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 \\ & X1))))))) \wedge ((m1_subset_1 X2 (u4_struct_0 X0)) \wedge (m1_subset_1 \\ & X3 (u4_struct_0 X1)))) \Rightarrow (k10_cat_2 X0 X1 X2 X3 = k4_tarski X2 X3) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge \\ & ((v6_cat_1 X0) \wedge (l1_cat_1 X0))))))) \wedge (m1_subset_1 X1 (u1_struct_0 \\ & X0))) \Rightarrow (k4_graph_1 X0 (k4_cat_1 X0 X1) = X1) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge \\ & ((v6_cat_1 X0) \wedge (l1_cat_1 X0))))))) \wedge (m1_subset_1 X1 (u1_struct_0 \\ & X0))) \Rightarrow (k3_graph_1 X0 (k4_cat_1 X0 X1) = X1) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.v1_relat_1 (k2_zfmisc_1 X0 X1) \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1_cat_1 X0) \Rightarrow ((v1_funct_1 (u1_cat_1 X0)) \wedge (m1_subset_1 \\ & (u1_cat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\ & X0) (u4_struct_0 X0)) (u4_struct_0 X0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge (l1_cat_1 X0))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 \\ & X2 (u1_struct_0 X0)))) \Rightarrow (\forall X3.(m1_cat_1 X3 X0 X1 X2) \Rightarrow (m1_subset_1 \\ & X3 (u4_struct_0 X0))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & ((v2_cat_1 X0) \wedge (v3_cat_1 X0) \wedge (v4_cat_1 X0) \wedge (v5_cat_1 X0) \wedge \\ & ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))) \wedge ((\neg v2_struct_0 X1) \wedge (\neg \\ & v11_struct_0 X1) \wedge (v2_cat_1 X1) \wedge (v3_cat_1 X1) \wedge (v4_cat_1 X1) \wedge \\ & (v5_cat_1 X1) \wedge (v6_cat_1 X1) \wedge (l1_cat_1 X1)))))) \Rightarrow ((\neg v2_struct_0 \\ & (k8_cat_2 X0 X1)) \wedge (\neg v11_struct_0 (k8_cat_2 X0 X1)) \wedge (v2_cat_1 \\ & (k8_cat_2 X0 X1)) \wedge (v3_cat_1 (k8_cat_2 X0 X1)) \wedge (v4_cat_1 (k8_cat_2 \\ & X0 X1)) \wedge (v5_cat_1 (k8_cat_2 X0 X1)) \wedge (v6_cat_1 (k8_cat_2 X0 X1)) \wedge \\ & (l1_cat_1 (k8_cat_2 X0 X1)))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & ((v5_cat_1 X0) \wedge (v6_cat_1 X0) \wedge (l1_cat_1 X0)))))) \wedge (m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (m1_cat_1 (k4_cat_1 X0 X1) X0 X1 X1) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2_struct_0 \\ & X0) \wedge (\neg v11_struct_0 X0) \wedge (v2_cat_1 X0) \wedge (v3_cat_1 X0) \wedge (v4_cat_1 \\ & X0) \wedge (v5_cat_1 X0) \wedge (v6_cat_1 X0) \wedge (l1_cat_1 X0)))))) \wedge (((\\ & \neg v2_struct_0 X1) \wedge (\neg v11_struct_0 X1) \wedge (v2_cat_1 X1) \wedge (v3_cat_1 \\ & X1) \wedge (v4_cat_1 X1) \wedge (v5_cat_1 X1) \wedge (v6_cat_1 X1) \wedge (l1_cat_1 \\ & X1)))))) \wedge (m1_subset_1 X2 (u4_struct_0 X0)) \wedge (m1_subset_1 \\ & X3 (u4_struct_0 X1)) \Rightarrow (m1_subset_1 (k10_cat_2 X0 X1 X2 X3) (u4_struct_0 \\ & (k8_cat_2 X0 X1))) \end{aligned} \quad (12)$$

Assume the following.

$$\forall X0. \forall X1. k4_tarski X0 X1 = k2_tarski (k2_tarski X0 X1) (k1_tarski X0) \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((v1_relat_1 X0) \wedge (v1_funct_1 X0)) \Rightarrow (\forall X1. \forall X2. \\ & ((X1 \in k9_xtuple_0 X0) \Rightarrow ((X2 = k1_funct_1 X0 X1) \Leftrightarrow (k4_tarski X1 X2 \in \\ & X0))) \wedge ((\neg X1 \in k9_xtuple_0 X0) \Rightarrow ((X2 = k1_funct_1 X0 X1) \Leftrightarrow (X2 = k1_xboole_0)))) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0. ((v1_relat_1 X0) \wedge (v1_funct_1 X0)) \Rightarrow (\forall X1. \forall X2. k1_binop_1 X0 X1 X2 = k1_funct_1 X0 (k4_tarski X1 X2)) \quad (15)$$

Assume the following.

$$\forall X0. (v1_relat_1 X0) \Rightarrow (\forall X1. (m1_subset_1 X1 (k1_zfmisc_1 X0)) \Rightarrow (v1_relat_1 X1)) \quad (16)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (k10_cat_2 (k8_cat_2 X0 X0) X0 (k10_cat_2 X0 X0 (k4_cat_1 X0 \\ & X1) (k4_cat_1 X0 X1)) (k4_cat_1 X0 X1) \in u1_cat_1 X0)) \end{aligned}$$