

t12_altcat_4 (TMRyzdwnjxAkpLpN- NMN6vBQaMzovnCFCZRR)

October 27, 2020

Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v2_altcat_1 : \iota \Rightarrow o$ be given. Let $v11_altcat_1 : \iota \Rightarrow o$ be given. Let $v12_altcat_1 : \iota \Rightarrow o$ be given. Let $l2_altcat_1 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $v6_altcat_3 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v7_altcat_3 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_altcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $v4_altcat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $l1_altcat_1 : \iota \Rightarrow o$ be given. Let $v1_altcat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_altcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v3_altcat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k8_altcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v2_altcat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2_altcat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge (l2_altcat_1 X0)) \Rightarrow (\forall X1. \\ & (m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 \\ & (u1_struct_0 X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (k1_altcat_1 X0 \\ & X1 X2)) \Rightarrow ((v7_altcat_3 X1 X0) \Rightarrow (v4_altcat_3 X3 X0 X1 X2)))))) \end{aligned} \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. \neg (X0 \in X1) \wedge (v1_xboole_0 X1) \quad (2)$$

Assume the following.

$$\forall X0. \forall X1. (m1_subset_1 X0 X1) \Rightarrow ((v1_xboole_0 X1) \vee (X0 \in X1)) \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1_altcat_1 X0) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow ((v7_altcat_3 X1 X0) \Leftrightarrow (\forall X2. (m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow (\exists X3. (m1_subset_1 X3 (k1_altcat_1 X0 X2 X1)) \wedge ((X3 \in \\ & k1_altcat_1 X0 X2 X1) \wedge (\forall X4. (m1_subset_1 X4 (k1_altcat_1 \\ & X0 X2 X1)) \Rightarrow ((X4 \in k1_altcat_1 X0 X2 X1) \Rightarrow (X3 = X4)))))))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1_altcat_1 X0) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ X0)) \Rightarrow ((v6_altcat_3 X1 X0) \Leftrightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ X0)) \Rightarrow (\exists X3.(m1_subset_1 X3 (k1_altcat_1 X0 X1 X2)) \wedge ((X3 \in \\ k1_altcat_1 X0 X1 X2) \wedge (\forall X4.(m1_subset_1 X4 (k1_altcat_1 \\ X0 X1 X2)) \Rightarrow ((X4 \in k1_altcat_1 X0 X1 X2) \Rightarrow (X3 = X4)))))))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\ X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\ (m1_subset_1 X4 (k1_altcat_1 X0 X1 X2)) \Rightarrow (\forall X5.(m1_subset_1 \\ X5 (k1_altcat_1 X0 X2 X3)) \Rightarrow ((v1_altcat_3 (k5_altcat_1 X0 X1 X2 X3 \\ X4 X5) X0 X1 X3) \Rightarrow ((k1_altcat_1 X0 X1 X2 = k1_xboole_0) \vee ((k1_altcat_1 \\ X0 X2 X3 = k1_xboole_0) \vee ((k1_altcat_1 X0 X3 X1 = k1_xboole_0) \vee (v1_altcat_3 \\ X5 X0 X2 X3))))))))))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\ X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (k1_altcat_1 X0 X1 X2)) \Rightarrow (((v1_altcat_3 \\ X3 X0 X1 X2) \wedge (v4_altcat_3 X3 X0 X1 X2)) \Rightarrow ((k1_altcat_1 X0 X1 X2 = k1_xboole_0) \vee \\ ((k1_altcat_1 X0 X2 X1 = k1_xboole_0) \vee (v3_altcat_3 X3 X0 X1 X2))))))) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0.\forall X1.(X0 \in X1) \Rightarrow (m1_subset_1 X0 X1) \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 \\ X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow ((v1_altcat_3 \\ (k8_altcat_1 X0 X1) X0 X1 X1) \wedge (v2_altcat_3 (k8_altcat_1 X0 X1) X0 \\ X1 X1))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 \\ X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (k8_altcat_1 \\ X0 X1 \in k1_altcat_1 X0 X1 X1)) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 \\ X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (k1_altcat_1 \\ X0 X1 X1 \neq k1_xboole_0)) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ & X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow (((v6_altcat_3 X1 X0) \wedge (r2_altcat_3 X0 X1 X2)) \Rightarrow (v6_altcat_3 \\ & X2 X0)))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ & X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow (((v7_altcat_3 X1 X0) \wedge (r2_altcat_3 X0 X2 X1)) \Rightarrow (v7_altcat_3 \\ & X2 X0)))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 \\ & X0) \wedge ((v11_altcat_1 X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \wedge \\ & ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X2 (u1_struct_0 \\ & X0))) \Rightarrow ((r2_altcat_3 X0 X1 X2) \Rightarrow (r2_altcat_3 X0 X2 X1)) \end{aligned} \quad (14)$$

Assume the following.

$$v1_xboole_0 \ k1_xboole_0 \quad (15)$$

Assume the following.

$$\forall X0.\exists X1.m1_subset_1 X1 X0 \quad (16)$$

Assume the following.

$$\forall X0.(l2_altcat_1 X0) \Rightarrow (l1_altcat_1 X0) \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & (((\neg v2_struct_0 X0) \wedge (l2_altcat_1 X0) \wedge ((m1_subset_1 X1 (u1_struct_0 \\ & X0)) \wedge ((m1_subset_1 X2 (u1_struct_0 X0)) \wedge ((m1_subset_1 X3 (u1_struct_0 \\ & X0)) \wedge ((m1_subset_1 X4 (k1_altcat_1 X0 X1 X2)) \wedge (m1_subset_1 X5 \\ & (k1_altcat_1 X0 X2 X3)))))) \Rightarrow (m1_subset_1 (k5_altcat_1 X0 X1 X2 \\ & X3 X4 X5) (k1_altcat_1 X0 X1 X3)) \end{aligned} \quad (18)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ & X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow ((r2_altcat_3 X0 X1 X2) \Leftrightarrow ((k1_altcat_1 X0 X1 X2 \neq k1_xboole_0) \wedge \\ & ((k1_altcat_1 X0 X2 X1 \neq k1_xboole_0) \wedge (\exists X3.(m1_subset_1 \\ & X3 (k1_altcat_1 X0 X1 X2)) \wedge (v3_altcat_3 X3 X0 X1 X2)))))) \end{aligned} \quad (19)$$

Theorem 1

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ & X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1. (m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow (((v6_altcat_3 X1 X0) \wedge (v7_altcat_3 X2 X0)) \Rightarrow ((k1_altcat_1 \\ & X0 X2 X1 = k1_xboole_0) \vee ((v6_altcat_3 X2 X0) \wedge (v7_altcat_3 X1 X0)))))) \end{aligned}$$