

t42_cat_4 (TMKd-
KEmJBkpe5wDkoHWT99DMUEW2uM5Mvod)

October 27, 2020

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 $v3_cat_4 : \iota \Rightarrow o$ be given. Let $l1_cat_4 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k9_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k15_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k18_cat_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\
 & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\
 & X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\
 & (m1_subset_1 X4 (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_subset_1 X5 \\
 & (u1_struct_0 X0)) \Rightarrow (\forall X6.(m1_cat_1 X6 X0 X1 X2) \Rightarrow (\forall X7. \\
 & (m1_cat_1 X7 X0 X3 X4) \Rightarrow (\forall X8.(m1_cat_1 X8 X0 X5 X1) \Rightarrow (\forall X9. \\
 & (m1_cat_1 X9 X0 X5 X3) \Rightarrow (\neg(k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 \\
 & X0 X3 X4 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X5 X1 \neq k1_xboole_0) \wedge ((k2_cat_1 \\
 & X0 X5 X3 \neq k1_xboole_0) \wedge (k5_cat_1 X0 X5 (k2_cat_4 X0 X1 X3) (k2_cat_4 \\
 & X0 X2 X4) (k9_cat_4 X0 X1 X3 X5 X8 X9) (k18_cat_4 X0 X1 X2 X3 X4 X6 X7) \neq \\
 & k9_cat_4 X0 X2 X4 X5 (k5_cat_1 X0 X5 X1 X2 X8 X6) (k5_cat_1 X0 X5 X3 X4 \\
 & X9 X7))))))))))))))
 \end{aligned}$$

(1)

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_cat_1 X3 X0 X1 X2) \Rightarrow ((k2_cat_1 X0 X1 X2 \neq k1_xboole_0) \Rightarrow (k5_cat_1 \\ & X0 X1 X1 X2 (k4_cat_1 X0 X1) X3 = X3)))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v5_cat_1 X0) \wedge (l1_cat_1 X0)))) \wedge (m1_subset_1 X1 (u1_struct_0 \\ & X0))) \Rightarrow (\neg v1_xboole_0 (k2_cat_1 X0 X1 X1)) \end{aligned} \quad (3)$$

Assume the following.

$$v1_xboole_0 k1_xboole_0 \quad (4)$$

Assume the following.

$$\forall X0.(l1_cat_4 X0) \Rightarrow (l1_cat_1 X0) \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))) \wedge (m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (m1_cat_1 (k4_cat_1 X0 X1) X0 X1 X1) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (k15_cat_4 X0 X1 = k9_cat_4 X0 X1 X1 X1 (k4_cat_1 \\ & X0 X1) (k4_cat_1 X0 X1))) \end{aligned} \quad (7)$$

Theorem 1

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v3_cat_4 X0) \wedge (l1_cat_4 X0)))))))))) \Rightarrow (\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\ & (m1_cat_1 X4 X0 X1 X2) \Rightarrow (\forall X5.(m1_cat_1 X5 X0 X1 X3) \Rightarrow (\neg (k2_cat_1 \\ & X0 X1 X2 \neq k1_xboole_0) \wedge ((k2_cat_1 X0 X1 X3 \neq k1_xboole_0) \wedge (k9_cat_4 \\ & X0 X2 X3 X1 X4 X5 \neq k5_cat_1 X0 X1 (k2_cat_4 X0 X1 X1) (k2_cat_4 X0 X2 X3) \\ & (k15_cat_4 X0 X1) (k18_cat_4 X0 X1 X2 X1 X3 X4 X5)))))))))) \end{aligned}$$