

t51_altcat_4 (TMG-
pEezggC838KRkPsg9JVM7pmZWWELmwQy)

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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 $k2_altcat_4 : \iota \Rightarrow \iota$ be given. Let $k1_altcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $v5_altcat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $m1_altcat_2 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4_altcat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1_altcat_1 : \iota \Rightarrow o$ be given. Let $v6_altcat_1 : \iota \Rightarrow o$ be given. Let $r2_altcat_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_altcat_1 : \iota \Rightarrow \iota$ be given. Let $k1_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0.(v1_xboole_0 X0) \Rightarrow (X0 = k1_xboole_0) \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge (l2_altcat_1 \\ & X0))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((v2_altcat_1 X1) \wedge (m1_altcat_2 \\ & X1 X0))) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4.(m1_subset_1 X4 \\ & (u1_struct_0 X1)) \Rightarrow (\forall X5.(m1_subset_1 X5 (u1_struct_0 X1)) \Rightarrow \\ & (\forall X6.(m1_subset_1 X6 (k1_altcat_1 X0 X2 X3)) \Rightarrow (\forall X7. \\ & (m1_subset_1 X7 (k1_altcat_1 X1 X4 X5)) \Rightarrow (((X4 = X2) \wedge ((X5 = X3) \wedge \\ & X6 = X7))) \Rightarrow ((k1_altcat_1 X1 X4 X5 = k1_xboole_0) \vee (((v4_altcat_3 \\ & X6 X0 X2 X3) \Rightarrow (v4_altcat_3 X7 X1 X4 X5)) \wedge ((v5_altcat_3 X6 X0 X2 X3) \Rightarrow \\ & (v5_altcat_3 X7 X1 X4 X5))))))))))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge (l2_altcat_1 X0)) \Rightarrow (\forall X1. \\
& ((\neg v2_struct_0 X1) \wedge (m1_altcat_2 X1 X0)) \Rightarrow (\forall X2.(m1_subset_1 \\
& X2 (u1_struct_0 X0)) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X4.(m1_subset_1 X4 (u1_struct_0 X1)) \Rightarrow (\forall X5. \\
& (m1_subset_1 X5 (u1_struct_0 X1)) \Rightarrow (((X2 = X4) \wedge (X3 = X5)) \Rightarrow ((k1_altcat_1 \\
& X1 X4 X5 = k1_xboole_0) \vee (\forall X6.(m1_subset_1 X6 (k1_altcat_1 \\
& X1 X4 X5)) \Rightarrow (m1_subset_1 X6 (k1_altcat_1 X0 X2 X3))))))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\forall X0. \forall X1. (m1_subset_1 X0 X1) \Rightarrow ((v1_xboole_0 X1) \vee (X0 \in X1)) \tag{4}$$

Assume the following.

$$\forall X0. (l2_altcat_1 X0) \Rightarrow (\forall X1. (m1_altcat_2 X1 X0) \Rightarrow (l2_altcat_1 X1)) \tag{5}$$

Assume the following.

$$\forall X0. (l2_altcat_1 X0) \Rightarrow (l1_altcat_1 X0) \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\
& X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))) \Rightarrow ((\neg v2_struct_0 \\
& (k2_altcat_4 X0)) \wedge ((v2_altcat_1 (k2_altcat_4 X0)) \wedge ((v6_altcat_1 \\
& (k2_altcat_4 X0)) \wedge (m1_altcat_2 (k2_altcat_4 X0) X0))))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\
& X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))) \Rightarrow (\forall X1. ((\\
& \neg v2_struct_0 X1) \wedge ((v2_altcat_1 X1) \wedge ((v6_altcat_1 X1) \wedge (m1_altcat_2 \\
& X1 X0)))) \Rightarrow ((X1 = k2_altcat_4 X0) \Leftrightarrow ((u1_struct_0 X1 = u1_struct_0 \\
& X0) \wedge ((r2_altcat_2 (k2_zfmisc_1 (u1_struct_0 X1) (u1_struct_0 \\
& X1)) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_altcat_1 \\
& X1) (u1_altcat_1 X0)) \wedge (\forall X2. (m1_subset_1 X2 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X3. (m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow (\forall X4. \\
& (m1_subset_1 X4 (k1_altcat_1 X0 X2 X3)) \Rightarrow ((X4 \in k1_binop_1 (u1_altcat_1 \\
& X1) X2 X3) \Leftrightarrow ((k1_altcat_1 X0 X2 X3 \neq k1_xboole_0) \wedge (v5_altcat_3 X4 \\
& X0 X2 X3))))))))))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0. (l1_altcat_1 X0) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k1_altcat_1 \\
& X0 X1 X2 = k1_binop_1 (u1_altcat_1 X0) X1 X2)))
\end{aligned} \tag{9}$$

Theorem 1

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ & X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1. (m1_subset_1 \\ & X1 (u1_struct_0 (k2_altcat_4 X0))) \Rightarrow (\forall X2. (m1_subset_1 \\ & X2 (u1_struct_0 (k2_altcat_4 X0))) \Rightarrow (\forall X3. (m1_subset_1 \\ & X3 (k1_altcat_1 (k2_altcat_4 X0) X1 X2)) \Rightarrow ((k1_altcat_1 (k2_altcat_4 \\ & X0) X1 X2 \neq k1_xboole_0) \Rightarrow (v5_altcat_3 X3 (k2_altcat_4 X0) X1 X2)))))) \end{aligned}$$