

## t9\_altcat\_3

(TMe1RypPsnKsXPF4Rj9oA7meuKVzi234tKC)

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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  $l2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  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  $k5\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_altcat\_1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
 & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v11\_altcat\_1 \\
 & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 \\
 & X0)) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. \\
 & (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\forall X4. (m1\_subset\_1 X4 \\
 & (u1\_struct\_0 X0)) \Rightarrow (\neg (k1\_altcat\_1 X0 X1 X2 \neq k1\_xboole\_0) \wedge ((k1\_altcat\_1 \\
 & X0 X2 X3 \neq k1\_xboole\_0) \wedge ((k1\_altcat\_1 X0 X3 X4 \neq k1\_xboole\_0) \wedge (\neg \\
 & \forall X5. (m1\_subset\_1 X5 (k1\_altcat\_1 X0 X1 X2)) \Rightarrow (\forall X6. \\
 & (m1\_subset\_1 X6 (k1\_altcat\_1 X0 X2 X3)) \Rightarrow (\forall X7. (m1\_subset\_1 \\
 & X7 (k1\_altcat\_1 X0 X3 X4)) \Rightarrow (k5\_altcat\_1 X0 X1 X3 X4 (k5\_altcat\_1 \\
 & X0 X1 X2 X3 X5 X6) X7 = k5\_altcat\_1 X0 X1 X2 X4 X5 (k5\_altcat\_1 X0 X2 X3 \\
 & X4 X6 X7)))))))))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\forall X0. (l2\_altcat\_1 X0) \Rightarrow (l1\_altcat\_1 X0) \tag{2}$$

Assume the following.

$$\begin{aligned}
 & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\
 & (((\neg v2\_struct\_0 X0) \wedge (l2\_altcat\_1 X0)) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 \\
 & X0)) \wedge ((m1\_subset\_1 X2 (u1\_struct\_0 X0)) \wedge ((m1\_subset\_1 X3 (u1\_struct\_0 \\
 & X0)) \wedge ((m1\_subset\_1 X4 (k1\_altcat\_1 X0 X1 X2)) \wedge (m1\_subset\_1 X5 \\
 & (k1\_altcat\_1 X0 X2 X3)))))) \Rightarrow (m1\_subset\_1 (k5\_altcat\_1 X0 X1 X2 \\
 & X3 X4 X5) (k1\_altcat\_1 X0 X1 X3))
 \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge (l2\_altcat\_1 X0)) \Rightarrow (\forall X1. \\
& (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 \\
& (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (k1\_altcat\_1 X0 \\
& X1 X2)) \Rightarrow ((v4\_altcat\_3 X3 X0 X1 X2) \Leftrightarrow (\forall X4.(m1\_subset\_1 X4 \\
& (u1\_struct\_0 X0)) \Rightarrow ((k1\_altcat\_1 X0 X4 X1 \neq k1\_xboole\_0) \Rightarrow (\forall X5. \\
& (m1\_subset\_1 X5 (k1\_altcat\_1 X0 X4 X1)) \Rightarrow (\forall X6.(m1\_subset\_1 \\
& X6 (k1\_altcat\_1 X0 X4 X1)) \Rightarrow ((k5\_altcat\_1 X0 X4 X1 X2 X5 X3 = k5\_altcat\_1 \\
& X0 X4 X1 X2 X6 X3) \Rightarrow (X5 = X6))))))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1\_altcat\_1 X0) \Rightarrow ((v2\_altcat\_1 X0) \Leftrightarrow (\forall X1.( \\
& m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 \\
& (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow \\
& (\neg(k1\_altcat\_1 X0 X1 X2 \neq k1\_xboole\_0) \wedge ((k1\_altcat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge \\
& (k1\_altcat\_1 X0 X1 X3 = k1\_xboole\_0))))))
\end{aligned} \tag{5}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v11\_altcat\_1 \\
& X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
& X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. \\
& (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\neg(k1\_altcat\_1 X0 X1 X2 \neq k1\_xboole\_0) \wedge \\
& ((k1\_altcat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge (\exists X4.(m1\_subset\_1 \\
& X4 (k1\_altcat\_1 X0 X1 X2)) \wedge (\exists X5.(m1\_subset\_1 X5 (k1\_altcat\_1 \\
& X0 X2 X3)) \wedge ((v4\_altcat\_3 X4 X0 X1 X2) \wedge ((v4\_altcat\_3 X5 X0 X2 X3) \wedge \\
& (\neg v4\_altcat\_3 (k5\_altcat\_1 X0 X1 X2 X3 X4 X5) X0 X1 X3))))))))))
\end{aligned}$$