

## t18\_altcat\_3

(TMb5Ky2AU9yoB3rYt2yPwziRtPmV5VZjNna)

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  $k1\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  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  $k8\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $r1\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  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.

$$\begin{aligned}
 & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 \\
 & X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\
 & (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow ((k1\_altcat\_1 X0 X1 X2 \neq k1\_xboole\_0) \Rightarrow \\
 & (\forall X3.(m1\_subset\_1 X3 (k1\_altcat\_1 X0 X1 X2)) \Rightarrow (k5\_altcat\_1 \\
 & X0 X1 X2 X2 X3 (k8\_altcat\_1 X0 X2) = X3))))))
 \end{aligned} \tag{2}$$

Assume the following.

$$\forall X0.(l2\_altcat\_1 X0) \Rightarrow (l1\_altcat\_1 X0) \tag{3}$$

Assume the following.

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

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((v12\_altcat\_1 X0)\wedge(l2\_altcat\_1 \\
& X0)))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2. \\
& (m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 \\
& (k1\_altcat\_1 X0 X1 X2))\Rightarrow((v1\_altcat\_3 X3 X0 X1 X2)\Leftrightarrow(\exists X4. \\
& (m1\_subset\_1 X4 (k1\_altcat\_1 X0 X2 X1))\wedge(r1\_altcat\_3 X0 X1 X2 X3 \\
& X4))))))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1\_altcat\_1 X0)\Rightarrow((v2\_altcat\_1 X0)\Leftrightarrow(\forall X1.( \\
& m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 \\
& (u1\_struct\_0 X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0))\Rightarrow \\
& (\neg(k1\_altcat\_1 X0 X1 X2\neq k1\_xboole\_0)\wedge((k1\_altcat\_1 X0 X2 X3\neq k1\_xboole\_0)\wedge \\
& (k1\_altcat\_1 X0 X1 X3 = k1\_xboole\_0))))))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((v12\_altcat\_1 X0)\wedge(l2\_altcat\_1 \\
& X0)))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2. \\
& (m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 \\
& (k1\_altcat\_1 X0 X1 X2))\Rightarrow(\forall X4.(m1\_subset\_1 X4 (k1\_altcat\_1 \\
& X0 X2 X1))\Rightarrow((r1\_altcat\_3 X0 X1 X2 X3 X4)\Leftrightarrow(k5\_altcat\_1 X0 X2 X1 X2 X4 \\
& X3 = k8\_altcat\_1 X0 X2))))))
\end{aligned} \tag{7}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((v2\_altcat\_1 X0)\wedge((v11\_altcat\_1 \\
& X0)\wedge((v12\_altcat\_1 X0)\wedge(l2\_altcat\_1 X0))))))\Rightarrow(\forall X1.(m1\_subset\_1 \\
& X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\
& X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0))\Rightarrow(\neg(k1\_altcat\_1 \\
& X0 X1 X2\neq k1\_xboole\_0)\wedge((k1\_altcat\_1 X0 X2 X3\neq k1\_xboole\_0)\wedge(( \\
& k1\_altcat\_1 X0 X3 X1\neq k1\_xboole\_0)\wedge(\exists X4.(m1\_subset\_1 X4 \\
& (k1\_altcat\_1 X0 X1 X2))\wedge(\exists X5.(m1\_subset\_1 X5 (k1\_altcat\_1 \\
& X0 X2 X3))\wedge((v1\_altcat\_3 X4 X0 X1 X2)\wedge((v1\_altcat\_3 X5 X0 X2 X3)\wedge \\
& (\neg v1\_altcat\_3 (k5\_altcat\_1 X0 X1 X2 X3 X4 X5) X0 X1 X3))))))))))
\end{aligned}$$