

## t25\_altcat\_2

(TMVf5ctjNqsFh1NmKGCEuEH8PLY3Ef7PYRu)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $l2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $m1\_altcat\_2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $u1\_altcat\_1 : \iota \Rightarrow \iota$  be given. Let  $g2\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_altcat\_1 : \iota \Rightarrow \iota$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  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  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $r1\_altcat\_2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $l1\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $k1\_binop\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge (l2\_altcat\_1 \\ & X0))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge (m1\_altcat\_2 \\ & X1 X0))) \Rightarrow (\forall X2.((\neg v2\_struct\_0 X2) \wedge ((v2\_altcat\_1 X2) \wedge ( \\ & m1\_altcat\_2 X2 X0))) \Rightarrow (((r1\_tarski (u1\_struct\_0 X1) (u1\_struct\_0 \\ & X2)) \wedge (r2\_altcat\_2 (k2\_zfmisc\_1 (u1\_struct\_0 X1) (u1\_struct\_0 \\ & X1)) (k2\_zfmisc\_1 (u1\_struct\_0 X2) (u1\_struct\_0 X2)) (u1\_altcat\_1 \\ & X1) (u1\_altcat\_1 X2))) \Rightarrow (m1\_altcat\_2 X1 X2)))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l2\_altcat\_1 X0) \Rightarrow (\forall X1.(l2\_altcat\_1 X1) \Rightarrow (( \\ & (m1\_altcat\_2 X0 X1) \wedge (m1\_altcat\_2 X1 X0)) \Rightarrow (g2\_altcat\_1 (u1\_struct\_0 \\ & X0) (u1\_altcat\_1 X0) (u2\_altcat\_1 X0) = g2\_altcat\_1 (u1\_struct\_0 \\ & X1) (u1\_altcat\_1 X1) (u2\_altcat\_1 X1)))) \end{aligned} \quad (2)$$

Assume the following.

$$\forall X0.(l2\_altcat\_1 X0) \Rightarrow (m1\_altcat\_2 X0 X0) \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.r1\_tarski X0 X0 \quad (4)$$

Assume the following.

$$\forall X0.\forall X1.(((v1\_relat\_1 X0)\wedge(v1\_funct\_1 X0))\wedge((v1\_relat\_1 X1)\wedge(v1\_funct\_1 X1)))\Rightarrow(r1\_altcat\_2 X0 X0) \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((v1\_relat\_1 X2)\wedge \\ & ((v4\_relat\_1 X2 X0)\wedge(v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0)))\wedge \\ & ((v1\_relat\_1 X3)\wedge(v4\_relat\_1 X3 X1)\wedge(v1\_funct\_1 X3)\wedge(v1\_partfun1 \\ & X3 X1))))\Rightarrow((r2\_altcat\_2 X0 X1 X2 X3)\Leftrightarrow(r1\_altcat\_2 X2 X3)) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_struct\_0 X0))\Rightarrow(\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (7)$$

Assume the following.

$$\forall X0.((v2\_struct\_0 X0)\wedge(l1\_struct\_0 X0))\Rightarrow(v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_altcat\_1 X0)\Rightarrow((v1\_relat\_1 (u1\_altcat\_1 X0))\wedge \\ & ((v4\_relat\_1 (u1\_altcat\_1 X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)))\wedge(v1\_funct\_1 (u1\_altcat\_1 X0))\wedge(v1\_partfun1 \\ & (u1\_altcat\_1 X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\forall X0.(l2\_altcat\_1 X0)\Rightarrow(\forall X1.(m1\_altcat\_2 X1 X0)\Rightarrow(l2\_altcat\_1 X1)) \quad (10)$$

Assume the following.

$$\forall X0.(l2\_altcat\_1 X0)\Rightarrow(l1\_altcat\_1 X0) \quad (11)$$

Assume the following.

$$\forall X0.(l1\_altcat\_1 X0)\Rightarrow(l1\_struct\_0 X0) \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_altcat\_1 X0)\Rightarrow((v2\_altcat\_1 X0)\Leftrightarrow(\forall X1.( \\ & m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 \\ & (u1\_struct\_0 X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0))\Rightarrow \\ & (\neg(k1\_altcat\_1 X0 X1 X2\neq k1\_xboole\_0)\wedge((k1\_altcat\_1 X0 X2 X3\neq k1\_xboole\_0)\wedge \\ & (k1\_altcat\_1 X0 X1 X3 = k1\_xboole\_0)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_altcat\_1 X0)\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\ & X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(k1\_altcat\_1 \\ & X0 X1 X2 = k1\_binop\_1 (u1\_altcat\_1 X0) X1 X2))) \end{aligned} \quad (14)$$

**Theorem 1**

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge (v2\_altcat\_1 X0) \wedge (l2\_altcat\_1 \\ & X0)) \Rightarrow (\forall X1. (m1\_altcat\_2 X1 X0) \Rightarrow (((u1\_struct\_0 X1 = u1\_struct\_0 \\ & X0) \wedge (u1\_altcat\_1 X1 = u1\_altcat\_1 X0)) \Rightarrow (g2\_altcat\_1 (u1\_struct\_0 \\ & X1) (u1\_altcat\_1 X1) (u2\_altcat\_1 X1) = g2\_altcat\_1 (u1\_struct\_0 \\ & X0) (u1\_altcat\_1 X0) (u2\_altcat\_1 X0)))) \end{aligned}$$