# t20_altcat_3 (TMY4f4zTP35c7K4vU5SzgRj43ZX7YKp7cp5)

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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 $k1\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1\_xboole\_0 : \iota$ be given. Let $v3\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_binop\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1\_altcat\_1 : \iota \Rightarrow \iota$ be given. Let $u2\_altcat\_1 : \iota \Rightarrow \iota$ be given. Let $r1\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((v2\_altcat\_1\ X0) \wedge ((v11\_altcat\_1\ X0) \wedge ((v12\_altcat\_1\ X0) \wedge (l2\_altcat\_1\ X0))))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)) \Rightarrow (\neg(k1\_altcat\_1\ X0\ X1\ X2 \neq k1\_xboole\_0) \wedge ((k1\_altcat\_1\ X0\ X2\ X1 \neq k1\_xboole\_0) \wedge (\neg \forall X3.(m1\_subset\_1\ X3\ (k1\_altcat\_1\ X0\ X1\ X2)) \Rightarrow ((v3\_altcat\_3\ X3\ X0\ X1\ X2) \Leftrightarrow ((v1\_altcat\_3\ X3\ X0\ X1\ X2) \wedge (v2\_altcat\_3\ X3\ X0\ X1\ X2)))))))) \tag{1}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((v2\_altcat\_1\ X0) \wedge ((v11\_altcat\_1\ X0) \wedge (l2\_altcat\_1\ X0)))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X4.(m1\_subset\_1\ X4\ (u1\_struct\_0\ X0)) \Rightarrow (\neg(k1\_altcat\_1\ X0\ X1\ X2 \neq k1\_xboole\_0) \wedge ((k1\_altcat\_1\ X0\ X2\ X3 \neq k1\_xboole\_0) \wedge ((k1\_altcat\_1\ X0\ X3\ X4 \neq k1\_xboole\_0) \wedge (\neg \forall X5.(m1\_subset\_1\ X5\ (k1\_altcat\_1\ X0\ X1\ X2)) \Rightarrow (\forall X6.(m1\_subset\_1\ X6\ (k1\_altcat\_1\ X0\ X2\ X3)) \Rightarrow (\forall X7.(m1\_subset\_1\ X7\ (k1\_altcat\_1\ X0\ X3\ X4)) \Rightarrow (k5\_altcat\_1\ X0\ X1\ X3\ X4\ (k5\_altcat\_1\ X0\ X1\ X2\ X3\ X5\ X6)\ X7 = k5\_altcat\_1\ X0\ X1\ X2\ X4\ X5\ (k5\_altcat\_1\ X0\ X2\ X3\ X4\ X6\ X7)))))))))))) \tag{2}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow((k1\_altcat\_1\ X0\ X1\ X2\neq k1\_xboole\_0)\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (k1\_altcat\_1\ X0\ X1\ X2))\Rightarrow(k5\_altcat\_1\ X0\ X1\ X2\ X2\ X3\ (k8\_altcat\_1\ X0\ X2) = X3)))))) \tag{3}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow((v1\_altcat\_3\ (k8\_altcat\_1\ X0\ X1)\ X0\ X1\ X1)\wedge(v2\_altcat\_3\ (k8\_altcat\_1\ X0\ X1)\ X0\ X1\ X1))) \tag{4}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(k1\_altcat\_1\ X0\ X1\ X1\neq k1\_xboole\_0)) \tag{5}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))\wedge(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0)))\Rightarrow(m1\_subset\_1\ (k8\_altcat\_1\ X0\ X1)\ (k1\_altcat\_1\ X0\ X1\ X1)) \tag{6}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5.(((\neg v2\_struct\_0\ X0)\wedge(l2\_altcat\_1\ X0))\wedge((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\wedge((m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\wedge((m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\wedge((m1\_subset\_1\ X4\ (k1\_altcat\_1\ X0\ X1\ X2))\wedge(m1\_subset\_1\ X5\ (k1\_altcat\_1\ X0\ X2\ X3)))))))\Rightarrow(m1\_subset\_1\ (k5\_altcat\_1\ X0\ X1\ X2\ X3\ X4\ X5)\ (k1\_altcat\_1\ X0\ X1\ X3)) \tag{7}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge(l2\_altcat\_1\ X0))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\Rightarrow(\neg(k1\_altcat\_1\ X0\ X1\ X2\neq k1\_xboole\_0)\wedge((k1\_altcat\_1\ X0\ X2\ X3\neq k1\_xboole\_0)\wedge(\neg\forall X4.(m1\_subset\_1\ X4\ (k1\_altcat\_1\ X0\ X1\ X2))\Rightarrow(\forall X5.(m1\_subset\_1\ X5\ (k1\_altcat\_1\ X0\ X2\ X3))\Rightarrow(k5\_altcat\_1\ X0\ X1\ X2\ X3\ X4\ X5 = k1\_binop\_1\ (k4\_altcat\_1\ (u1\_struct\_0\ X0)\ (u1\_altcat\_1\ X0)\ (u2\_altcat\_1\ X0)\ X1\ X2\ X3)\ X5\ X4)))))))) \tag{8}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge(l2\_altcat\_1\ X0))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (k1\_altcat\_1\ X0\ X1\ X2))\Rightarrow((v4\_altcat\_3\ X3\ X0\ X1\ X2)\Leftrightarrow(\forall X4.(m1\_subset\_1\ X4\ (u1\_struct\_0\ X0))\Rightarrow((k1\_altcat\_1\ X0\ X4\ X1\neq k1\_xboole\_0)\Rightarrow(\forall X5.(m1\_subset\_1\ X5\ (k1\_altcat\_1\ X0\ X4\ X1))\Rightarrow(\forall X6.(m1\_subset\_1\ X6\ (k1\_altcat\_1\ X0\ X4\ X1))\Rightarrow((k5\_altcat\_1\ X0\ X4\ X1\ X2\ X5\ X3 = k5\_altcat\_1\ X0\ X4\ X1\ X2\ X6\ X3)\Rightarrow(X5 = X6)))))))))) \tag{9}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (k1\_altcat\_1\ X0\ X1\ X2))\Rightarrow((v2\_altcat\_3\ X3\ X0\ X1\ X2)\Leftrightarrow(\exists X4.(m1\_subset\_1\ X4\ (k1\_altcat\_1\ X0\ X2\ X1))\wedge(r1\_altcat\_3\ X0\ X2\ X1\ X4\ X3)))))) \tag{10}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (k1\_altcat\_1\ X0\ X1\ X2))\Rightarrow((v1\_altcat\_3\ X3\ X0\ X1\ X2)\Leftrightarrow(\exists X4.(m1\_subset\_1\ X4\ (k1\_altcat\_1\ X0\ X2\ X1))\wedge(r1\_altcat\_3\ X0\ X1\ X2\ X3\ X4)))))) \tag{11}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (k1\_altcat\_1\ X0\ X1\ X2))\Rightarrow(\forall X4.(m1\_subset\_1\ X4\ (k1\_altcat\_1\ X0\ X2\ X1))\Rightarrow((r1\_altcat\_3\ X0\ X1\ X2\ X3\ X4)\Leftrightarrow(k5\_altcat\_1\ X0\ X2\ X1\ X2\ X4\ X3 = k8\_altcat\_1\ X0\ X2)))))) \tag{12}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (k1\_altcat\_1\ X0\ X1\ X1))\Rightarrow((X2 = k8\_altcat\_1\ X0\ X1)\Leftrightarrow(\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\Rightarrow((k1\_altcat\_1\ X0\ X1\ X3\neq k1\_xboole\_0)\Rightarrow(\forall X4.(m1\_subset\_1\ X4\ (k1\_altcat\_1\ X0\ X1\ X3))\Rightarrow(k5\_altcat\_1\ X0\ X1\ X1\ X3\ X2\ X4 = X4))))))) \tag{13}$$

**Theorem 1**

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v2\_altcat\_1\ X0)\wedge((v11\_altcat\_1\ X0)\wedge((v12\_altcat\_1\ X0)\wedge(l2\_altcat\_1\ X0)))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (k1\_altcat\_1\ X0\ X1\ X2))\Rightarrow(((v1\_altcat\_3\ X3\ X0\ X1\ X2)\wedge(v4\_altcat\_3\ X3\ X0\ X1\ X2))\Rightarrow((k1\_altcat\_1\ X0\ X1\ X2 = k1\_xboole\_0)\vee((k1\_altcat\_1\ X0\ X2\ X1 = k1\_xboole\_0)\vee(v3\_altcat\_3\ X3\ X0\ X1\ X2)))))))$$