

## t26\_cat\_3

(TMdtaJKZhqcjpNxbu3HKDZcyznUa2U22sjH)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v3\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v5\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v6\_cat\_1 : \iota \Rightarrow o$  be given. Let  $l1\_cat\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $m1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_cat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $k4\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
 & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
 & X0) \wedge (l1\_cat\_1 X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
 & X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. \\
 & (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 \\
 & (u1\_struct\_0 X0)) \Rightarrow (\forall X5.(m1\_cat\_1 X5 X0 X1 X2) \Rightarrow (\forall X6. \\
 & (m1\_cat\_1 X6 X0 X2 X3) \Rightarrow (\forall X7.(m1\_cat\_1 X7 X0 X3 X4) \Rightarrow (\neg(k2\_cat\_1 \\
 & X0 X1 X2 \neq k1\_xboole\_0) \wedge ((k2\_cat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge ((k2\_cat\_1 \\
 & X0 X3 X4 \neq k1\_xboole\_0) \wedge (k5\_cat\_1 X0 X1 X2 X4 X5 (k5\_cat\_1 X0 X2 X3 X4 \\
 & X6 X7) \neq k5\_cat\_1 X0 X1 X3 X4 (k5\_cat\_1 X0 X1 X2 X3 X5 X6) X7)))))))))) \\
 & \tag{1}
 \end{aligned}$$

Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
 & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
 & X0) \wedge (l1\_cat\_1 X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
 & X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. \\
 & (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\neg(k2\_cat\_1 X0 X1 X2 \neq k1\_xboole\_0) \wedge \\
 & ((k2\_cat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge (k2\_cat\_1 X0 X1 X3 = k1\_xboole\_0)))))) \\
 & \tag{2}
 \end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\
& (((\neg v2\_struct\_0 X0)\wedge(\neg v11\_struct\_0 X0)\wedge(v2\_cat\_1 X0)\wedge(v3\_cat\_1 \\
& \quad X0)\wedge(v4\_cat\_1 X0)\wedge(v5\_cat\_1 X0)\wedge(v6\_cat\_1 X0)\wedge(l1\_cat\_1 \\
& \quad X0))))\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 \\
& \quad X2 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X3 (u1\_struct\_0 X0))\wedge(m1\_cat\_1 \\
& \quad X4 X0 X1 X2)\wedge(m1\_cat\_1 X5 X0 X2 X3))))\Rightarrow(m1\_cat\_1 (k5\_cat\_1 X0 X1 \\
& \quad X2 X3 X4 X5) X0 X1 X3)
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge(\neg v11\_struct\_0 X0)\wedge(v2\_cat\_1 \\
& \quad X0)\wedge(v3\_cat\_1 X0)\wedge(v4\_cat\_1 X0)\wedge(v5\_cat\_1 X0)\wedge(v6\_cat\_1 \\
& \quad X0)\wedge(l1\_cat\_1 X0))))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
& \quad X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(\forall X3. \\
& \quad (m1\_cat\_1 X3 X0 X1 X2)\Rightarrow((v1\_cat\_3 X3 X0 X1 X2)\Leftrightarrow((k2\_cat\_1 X0 X1 X2\neq \\
& \quad k1\_xboole\_0)\wedge((k2\_cat\_1 X0 X2 X1\neq k1\_xboole\_0)\wedge(\exists X4.( \\
& \quad m1\_cat\_1 X4 X0 X2 X1)\wedge(k5\_cat\_1 X0 X2 X1 X2 X4 X3 = k4\_cat\_1 X0 X2))))))
\end{aligned} \tag{4}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge(\neg v11\_struct\_0 X0)\wedge(v2\_cat\_1 \\
& \quad X0)\wedge(v3\_cat\_1 X0)\wedge(v4\_cat\_1 X0)\wedge(v5\_cat\_1 X0)\wedge(v6\_cat\_1 \\
& \quad X0)\wedge(l1\_cat\_1 X0))))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
& \quad X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(\forall X3. \\
& \quad (m1\_subset\_1 X3 (u1\_struct\_0 X0))\Rightarrow(\forall X4.(m1\_cat\_1 X4 X0 \\
& \quad X2 X3)\Rightarrow(\forall X5.(m1\_cat\_1 X5 X0 X3 X1)\Rightarrow((v1\_cat\_3 (k5\_cat\_1 \\
& \quad X0 X2 X3 X1 X4 X5) X0 X2 X1)\Rightarrow((k2\_cat\_1 X0 X2 X3 = k1\_xboole\_0)\vee((k2\_cat\_1 \\
& \quad X0 X3 X2 = k1\_xboole\_0)\vee(v1\_cat\_3 X5 X0 X3 X1))))))
\end{aligned}$$