

t74\_cat\_4 (TMGTBN-  
bGsZXppB8hpGgPvKTMhrUFBgMP8TN)

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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  $v6\_cat\_4 : \iota \Rightarrow o$  be given. Let  $l2\_cat\_4 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $k20\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_cat\_1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge ((v6\_cat\_4 X0) \wedge (l2\_cat\_4 X0)))))))))) \Rightarrow (\forall X1.(m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\neg(k2\_cat\_1 \\ & X0 X1 X2 \neq k1\_xboole\_0) \wedge ((k2\_cat\_1 X0 X3 X2 \neq k1\_xboole\_0) \wedge (k2\_cat\_1 \\ & X0 (k20\_cat\_4 X0 X1 X3) X2 = k1\_xboole\_0)))))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge ((v6\_cat\_4 X0) \wedge (l2\_cat\_4 X0)))))))))) \Rightarrow (\forall X1.(m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \Rightarrow ((k2\_cat\_1 X0 X1 (k20\_cat\_4 X0 X1 X2) \neq k1\_xboole\_0) \wedge (k2\_cat\_1 \\ & X0 X2 (k20\_cat\_4 X0 X1 X2) \neq k1\_xboole\_0)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge (l1\_cat\_1 X0)))))))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\ & X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. \\ & (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\neg(k2\_cat\_1 X0 X1 X2 \neq k1\_xboole\_0) \wedge \\ & ((k2\_cat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge (k2\_cat\_1 X0 X1 X3 = k1\_xboole\_0)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.(l2\_cat\_4 X0)\Rightarrow(l1\_cat\_1 X0) \quad (4)$$

Assume the following.

$$\begin{aligned} &\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 \\ &X0)\wedge(l2\_cat\_4 X0)))\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 \\ &X2 (u1\_struct\_0 X0))))\Rightarrow(m1\_subset\_1 (k20\_cat\_4 X0 X1 X2) (u1\_struct\_0 \\ &X0)) \end{aligned} \quad (5)$$

**Theorem 1**

$$\begin{aligned} &\forall X0.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_cat\_1 \\ &X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 X0)\wedge((v5\_cat\_1 X0)\wedge((v6\_cat\_1 \\ &X0)\wedge((v6\_cat\_4 X0)\wedge(l2\_cat\_4 X0))))))))))\Rightarrow(\forall X1.(m1\_subset\_1 \\ &X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ &X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0))\Rightarrow(\forall X4. \\ &(m1\_subset\_1 X4 (u1\_struct\_0 X0))\Rightarrow(\neg(k2\_cat\_1 X0 X1 X2\neq k1\_xboole\_0)\wedge \\ &((k2\_cat\_1 X0 X3 X4\neq k1\_xboole\_0)\wedge(k2\_cat\_1 X0 (k20\_cat\_4 X0 X1 \\ &X3) (k20\_cat\_4 X0 X2 X4) = k1\_xboole\_0))))))) \end{aligned}$$