

# t69\_cat\_4 (TMG- neNwp4fmQCdb36uAzyAWHtUERqWyprYj)

October 27, 2020

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  $m1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k29\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $k20\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k27\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k28\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & (((\neg v2\_struct\_0 X0) \wedge (\neg v11\_struct\_0 X0) \wedge (v2\_cat\_1 X0) \wedge (v3\_cat\_1 \\ & \quad X0) \wedge (v4\_cat\_1 X0) \wedge (v5\_cat\_1 X0) \wedge (v6\_cat\_1 X0) \wedge (v6\_cat\_4 \\ & \quad X0) \wedge (l2\_cat\_4 X0)))))) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge \\ & ((m1\_subset\_1 X2 (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 X3 (u1\_struct\_0 \\ & X0)) \wedge ((m1\_cat\_1 X4 X0 X1 X3) \wedge (m1\_cat\_1 X5 X0 X2 X3)))))) \Rightarrow (m1\_cat\_1 \\ & (k29\_cat\_4 X0 X1 X2 X3 X4 X5) X0 (k20\_cat\_4 X0 X1 X2) X3) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge (\neg v11\_struct\_0 X0) \wedge (v2\_cat\_1 \\ & \quad X0) \wedge (v3\_cat\_1 X0) \wedge (v4\_cat\_1 X0) \wedge (v5\_cat\_1 X0) \wedge (v6\_cat\_1 \\ & \quad X0) \wedge (v6\_cat\_4 X0) \wedge (l2\_cat\_4 X0)))))) \Rightarrow (\forall X1. (m1\_subset\_1 \\ & \quad X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (u1\_struct\_0 \\ & \quad X0)) \Rightarrow (\forall X3. (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\forall X4. \\ & (m1\_cat\_1 X4 X0 X1 X3) \Rightarrow (\forall X5. (m1\_cat\_1 X5 X0 X2 X3) \Rightarrow (\neg (k2\_cat\_1 \\ & \quad X0 X1 X3 \neq k1\_xboole\_0) \wedge ((k2\_cat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge (\neg \forall X6. \\ & (m1\_cat\_1 X6 X0 (k20\_cat\_4 X0 X1 X2) X3) \Rightarrow ((X6 = k29\_cat\_4 X0 X1 X2 X3 \\ & \quad X4 X5) \Leftrightarrow ((k5\_cat\_1 X0 X1 (k20\_cat\_4 X0 X1 X2) X3 (k27\_cat\_4 X0 X1 X2) \\ & \quad X6 = X4) \wedge (k5\_cat\_1 X0 X2 (k20\_cat\_4 X0 X1 X2) X3 (k28\_cat\_4 X0 X1 X2) \\ & \quad X6 = X5))))))))))))) \end{aligned} \tag{2}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge ((v6\_cat\_4 X0) \wedge (l2\_cat\_4 X0)))))))))) \Rightarrow (\forall X1.(m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\forall X4. \\ & (m1\_cat\_1 X4 X0 X1 X2) \Rightarrow (\forall X5.(m1\_cat\_1 X5 X0 X1 X2) \Rightarrow (\forall X6. \\ & (m1\_cat\_1 X6 X0 X3 X2) \Rightarrow (\forall X7.(m1\_cat\_1 X7 X0 X3 X2) \Rightarrow ((k29\_cat\_4 \\ X0 X1 X3 X2 X4 X6 = k29\_cat\_4 X0 X1 X3 X2 X5 X7) \Rightarrow ((k2\_cat\_1 X0 X1 X2 = k1\_xboole\_0) \vee \\ & ((k2\_cat\_1 X0 X3 X2 = k1\_xboole\_0) \vee ((X4 = X5) \wedge (X6 = X7)))))))))))))) \end{aligned}$$