

## t16\_cat\_4

(TMV6y9yhH3CPq4G44PS3rfW2Tf6qUpTrHgH)

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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  $v3\_cat\_4 : \iota \Rightarrow o$  be given. Let  $l1\_cat\_4 : \iota \Rightarrow o$  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  $k1\_cat\_4 : \iota \Rightarrow \iota$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k6\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v10\_cat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge (l1\_cat\_1 X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\ & X0)) \Rightarrow ((v10\_cat\_1 X1 X0) \Leftrightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \Rightarrow (\exists X3.(m1\_cat\_1 X3 X0 X2 X1) \wedge (k2\_cat\_1 X0 X2 X1 = k1\_tarski \\ & X3)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge ((v3\_cat\_4 X0) \wedge (l1\_cat\_4 X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_cat\_1 X2 X0 X1 (k1\_cat\_4 X0)) \Rightarrow \\ & (\forall X3.(m1\_cat\_1 X3 X0 X1 (k1\_cat\_4 X0)) \Rightarrow (X2 = X3)))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge ((v3\_cat\_4 X0) \wedge (l1\_cat\_4 X0)))))))) \Rightarrow (v10\_cat\_1 (k1\_cat\_4 \\ & X0) X0) \end{aligned} \tag{3}$$

Assume the following.

$$\forall X0.(l1\_cat\_4 X0) \Rightarrow (l1\_cat\_1 X0) \tag{4}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (\neg v11\_struct\_0 X0) \wedge \\ & ((v2\_cat\_1 X0) \wedge (v3\_cat\_1 X0) \wedge (v4\_cat\_1 X0) \wedge (v5\_cat\_1 X0) \wedge \\ & ((v6\_cat\_1 X0) \wedge (v3\_cat\_4 X0) \wedge (l1\_cat\_4 X0)))))) \wedge (m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow (m1\_cat\_1 (k6\_cat\_4 X0 X1) X0 X1 (k1\_cat\_4 \\ & X0)) \end{aligned} \tag{5}$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge (\neg v11\_struct\_0 X0) \wedge (l1\_cat\_4 X0)) \Rightarrow (m1\_subset\_1 (k1\_cat\_4 X0) (u1\_struct\_0 X0)) \tag{6}$$

**Theorem 1**

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge (\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge (v3\_cat\_1 X0) \wedge (v4\_cat\_1 X0) \wedge (v5\_cat\_1 X0) \wedge (v6\_cat\_1 \\ & X0) \wedge (v3\_cat\_4 X0) \wedge (l1\_cat\_4 X0)))) \Rightarrow (\forall X1. (m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0) \Rightarrow (k2\_cat\_1 X0 X1 (k1\_cat\_4 X0) = k1\_tarski ( \\ & k6\_cat\_4 X0 X1))) \end{aligned}$$