

# t3\_sublemma (TM- SCZTQKxQbPt2iYG9KatrmEKxb8Q97t5WA)

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Let  $m1\_qc\_lang1 : \iota \Rightarrow o$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k16\_subst1 : \iota \Rightarrow \iota$  be given. Let  $k38\_subst1 : \iota \Rightarrow \iota$  be given. Let  $v2\_subst1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k39\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_cqc\_lang : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k37\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_qc\_lang1 : \iota \Rightarrow \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v4\_subst1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k10\_qc\_lang1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k16\_qc\_lang1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k18\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k26\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k19\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v5\_subst1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k13\_qc\_lang1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k27\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v6\_subst1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k14\_qc\_lang1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k28\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k29\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v7\_subst1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k36\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k31\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((\neg v1\_xboole\_0 X0) \wedge ((\neg v1\_xboole\_0 X1) \wedge \\ & (m1\_subset\_1 X1 (k1\_zfmisc\_1 X0)))) \Rightarrow (\forall X2. (m2\_subset\_1 \\ & X2 X0 X1) \Leftrightarrow (m1\_subset\_1 X2 X1)) \end{aligned} \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. ((m1\_qc\_lang1 X0) \wedge (m1\_subset\_1 X1 (k38\_subst1 X0))) \Rightarrow (k39\_subst1 X0 X1 = k37\_subst1 X0 X1) \quad (2)$$

Assume the following.

$$\forall X0. (m1\_qc\_lang1 X0) \Rightarrow (\neg v1\_xboole\_0 (k38\_subst1 X0)) \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((\neg v1\_xboole\_0 X0) \wedge ((\neg v1\_xboole\_0 X1) \wedge \\ & (m1\_subset\_1 X1 (k1\_zfmisc\_1 X0)))) \Rightarrow (\forall X2. (m2\_subset\_1 \\ & X2 X0 X1) \Rightarrow (m1\_subset\_1 X2 X0)) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0.(m1\_qc\_lang1 X0) \Rightarrow (m1\_subset\_1 (k38\_subst1 X0) (k1\_zfmisc\_1 (k16\_subst1 X0))) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.((m1\_qc\_lang1 X0) \wedge (m1\_subset\_1 X1 (k16\_subst1 X0))) \Rightarrow (m1\_subset\_1 (k37\_subst1 X0 X1) (k9\_qc\_lang1 X0)) \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.(m1\_qc\_lang1 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k16\_subst1 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (k9\_qc\_lang1 X0)) \Rightarrow ((X2 = k37\_subst1 X0 X1) \Leftrightarrow (\exists X3.((v1\_funct\_1 X3) \wedge ((v1\_funct\_2 X3 (k16\_subst1 X0) (k9\_qc\_lang1 X0)) \wedge (m1\_subset\_1 X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k16\_subst1 X0) (k9\_qc\_lang1 X0)))))) \wedge ((X2 = k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 X1) \wedge (\forall X4.(m1\_subset\_1 X4 (k16\_subst1 X0)) \Rightarrow (((v2\_subst1 X4 X0) \Rightarrow (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 X4 = k5\_cqc\_lang X0)) \wedge (((v4\_subst1 X4 X0) \Rightarrow (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 X4 = k10\_qc\_lang1 X0 (k16\_qc\_lang1 X0 (k18\_subst1 X0 X4)) (k3\_subst1 X0 (k26\_subst1 X0 X4) (k19\_subst1 X0 X4)))) \wedge ((v5\_subst1 X4 X0) \Rightarrow (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 X4 = k13\_qc\_lang1 X0 (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 (k27\_subst1 X0 X4)))) \wedge ((v6\_subst1 X4 X0) \Rightarrow (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 X4 = k14\_qc\_lang1 X0 (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 (k28\_subst1 X0 X4)) (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 (k29\_subst1 X0 X4)))) \wedge ((v7\_subst1 X4 X0) \Rightarrow (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 X4 = k36\_subst1 X0 X4 (k3\_funct\_2 (k16\_subst1 X0) (k9\_qc\_lang1 X0) X3 (k31\_subst1 X0 X4)))))))))))))) \quad (7) \end{aligned}$$

Assume the following.

$$\forall X0.(v1\_xboole\_0 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 X0)) \Rightarrow (v1\_xboole\_0 X1)) \quad (8)$$

**Theorem 1**

$$\forall X0.(m1\_qc\_lang1 X0) \Rightarrow (\forall X1.(m2\_subset\_1 X1 (k16\_subst1 X0) (k38\_subst1 X0)) \Rightarrow ((v2\_subst1 X1 X0) \Rightarrow (k39\_subst1 X0 X1 = k5\_cqc\_lang X0)))$$