

## t37\_substut1

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Let  $m1\_qc\_lang1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k16\_substut1 : \iota \Rightarrow \iota$  be given. Let  $k19\_substut1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k37\_substut1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_qc\_lang1 : \iota \Rightarrow \iota$  be given. Let  $k3\_cqc\_lang : \iota \Rightarrow \iota$  be given. Let  $k21\_substut1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k14\_qc\_lang1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0.(m1\_qc\_lang1 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k9\_qc\_lang1 \\ & X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (k9\_qc\_lang1 X0)) \Rightarrow ((m2\_subset\_1 \\ & (k14\_qc\_lang1 X0 X1 X2) (k9\_qc\_lang1 X0) (k3\_cqc\_lang X0)) \Leftrightarrow ((m2\_subset\_1 \\ & X1 (k9\_qc\_lang1 X0) (k3\_cqc\_lang X0)) \wedge (m2\_subset\_1 X2 (k9\_qc\_lang1 \\ & X0) (k3\_cqc\_lang X0)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.(m1\_qc\_lang1 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k16\_substut1 \\ & X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (k16\_substut1 X0)) \Rightarrow ((k19\_substut1 \\ & X0 X1 = k19\_substut1 X0 X2) \Rightarrow (k37\_substut1 X0 (k21\_substut1 X0 X1 \\ & X2) = k14\_qc\_lang1 X0 (k37\_substut1 X0 X1) (k37\_substut1 X0 X2)))))) \end{aligned} \tag{2}$$

Assume the following.

$$\forall X0.\forall X1.((m1\_qc\_lang1 X0) \wedge (m1\_subset\_1 X1 (k16\_substut1 X0))) \Rightarrow (m1\_subset\_1 (k37\_substut1 X0 X1) (k9\_qc\_lang1 X0)) \tag{3}$$

### Theorem 1

$$\begin{aligned} & \forall X0.(m1\_qc\_lang1 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k16\_substut1 \\ & X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (k16\_substut1 X0)) \Rightarrow (((k19\_substut1 \\ & X0 X1 = k19\_substut1 X0 X2) \wedge ((m2\_subset\_1 (k37\_substut1 X0 X1) ( \\ & k9\_qc\_lang1 X0) (k3\_cqc\_lang X0)) \wedge (m2\_subset\_1 (k37\_substut1 \\ & X0 X2) (k9\_qc\_lang1 X0) (k3\_cqc\_lang X0)))) \Rightarrow (m2\_subset\_1 (k37\_substut1 \\ & X0 (k21\_substut1 X0 X1 X2)) (k9\_qc\_lang1 X0) (k3\_cqc\_lang X0)))))) \end{aligned}$$