

# t73\_sublemma (TMbE- WFB21P3wAp1SPDBsB4uXXXsBXzCG6M7)

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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  $k2\_qc\_lang1 : \iota \Rightarrow \iota$  be given. Let  $k3\_qc\_lang1 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $m1\_valuat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m2\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_valuat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k16\_subst1 : \iota \Rightarrow \iota$  be given. Let  $k38\_subst1 : \iota \Rightarrow \iota$  be given. Let  $m1\_subst1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k7\_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k13\_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k12\_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_valuat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_sublemma : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $m1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  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.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((\neg v1\_xboole\_0 X1) \wedge (m1\_funct\_2 \\ & X2 X0 X1)) \Rightarrow (\forall X3. (m2\_funct\_2 X3 X0 X1 X2) \Leftrightarrow (m1\_subset\_1 X3 \\ & X2)) \end{aligned} \quad (2)$$

Assume the following.

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

Assume the following.

$$\forall X0. (m1\_qc\_lang1 X0) \Rightarrow (\neg v1\_xboole\_0 (k3\_qc\_lang1 X0)) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. (m1\_qc\_lang1 X0) \Rightarrow (m1\_subset\_1 (k3\_qc\_lang1 X0) (k1\_zfmisc\_1 \\ & (k2\_qc\_lang1 X0))) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0.(m1\_qc\_lang1\ X0)\Rightarrow(m1\_subset\_1\ (k38\_subst1\ X0)\ (k1\_zfmisc\_1\ (k16\_subst1\ X0))) \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.((m1\_qc\_lang1\ X0)\wedge(\neg v1\_xboole\_0\ X1))\Rightarrow(m1\_funct\_2\ (k2\_valuat\_1\ X0\ X1)\ (k3\_qc\_lang1\ X0)\ X1) \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((m1\_qc\_lang1\ X0)\wedge \\ & ((\neg v1\_xboole\_0\ X1)\wedge((m1\_subset\_1\ X2\ (k2\_valuat\_1\ X0\ X1))\wedge((v1\_funct\_1 \\ & X3)\wedge(m1\_subset\_1\ X3\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1\ (k3\_qc\_lang1\ X0) \\ & X1))))))\Rightarrow(m2\_funct\_2\ (k1\_sublemma\ X0\ X1\ X2\ X3)\ (k3\_qc\_lang1\ X0) \\ & X1\ (k2\_valuat\_1\ X0\ X1)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & ((m1\_qc\_lang1\ X0)\wedge((m1\_subset\_1\ X1\ (k38\_subst1\ X0))\wedge((m1\_subset\_1 \\ & X2\ (k3\_qc\_lang1\ X0))\wedge((m1\_subst1\ X3\ X0\ (k7\_sublemma\ X0\ X1\ X2))\wedge \\ & ((\neg v1\_xboole\_0\ X4)\wedge(m1\_subset\_1\ X5\ (k2\_valuat\_1\ X0\ X4))))))\Rightarrow \\ & ((v1\_funct\_1\ (k13\_sublemma\ X0\ X1\ X2\ X3\ X4\ X5))\wedge(m1\_subset\_1\ (k13\_sublemma \\ & X0\ X1\ X2\ X3\ X4\ X5)\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1\ (k3\_qc\_lang1\ X0)\ X4)))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((m1\_qc\_lang1\ X0)\wedge \\ & ((\neg v1\_xboole\_0\ X1)\wedge((m1\_subset\_1\ X2\ (k3\_qc\_lang1\ X0))\wedge(m1\_subset\_1 \\ & X3\ X1))))\Rightarrow((v1\_funct\_1\ (k12\_sublemma\ X0\ X1\ X2\ X3))\wedge(m1\_subset\_1 \\ & (k12\_sublemma\ X0\ X1\ X2\ X3)\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1\ (k3\_qc\_lang1 \\ & X0)\ X1)))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.(m1\_qc\_lang1\ X0)\Rightarrow(\forall X1.(m2\_subset\_1\ X1\ (k16\_subst1 \\ & X0)\ (k38\_subst1\ X0))\Rightarrow(\forall X2.(\neg v1\_xboole\_0\ X2)\Rightarrow(\forall X3. \\ & (m2\_funct\_2\ X3\ (k3\_qc\_lang1\ X0)\ X2\ (k2\_valuat\_1\ X0\ X2))\Rightarrow(\forall X4. \\ & (m1\_valuat\_1\ X4\ X0\ X2)\Rightarrow((r1\_sublemma\ X0\ X1\ X2\ X3\ X4)\Leftrightarrow(r1\_valuat\_1 \\ & X0\ X2\ (k2\_sublemma\ X0\ X1)\ X4\ X3)))))) \end{aligned} \quad (11)$$

Assume the following.

$$\forall X0.(v1\_xboole\_0\ X0)\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (k1\_zfmisc\_1\ X0))\Rightarrow(v1\_xboole\_0\ X1)) \quad (12)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.(m1\_qc\_lang1\ X0) \Rightarrow (\forall X1.(m2\_subset\_1\ X1\ (k2\_qc\_lang1 \\ & \quad X0)\ (k3\_qc\_lang1\ X0)) \Rightarrow (\forall X2.(\neg v1\_xboole\_0\ X2) \Rightarrow (\forall X3. \\ & \quad (m1\_valuat\_1\ X3\ X0\ X2) \Rightarrow (\forall X4.(m2\_funct\_2\ X4\ (k3\_qc\_lang1 \\ & \quad X0)\ X2\ (k2\_valuat\_1\ X0\ X2)) \Rightarrow (\forall X5.(m2\_subset\_1\ X5\ (k16\_subst1 \\ & \quad X0)\ (k38\_subst1\ X0)) \Rightarrow (\forall X6.(m1\_subst1\ X6\ X0\ (k7\_sublemma \\ & \quad X0\ X5\ X1)) \Rightarrow ((\forall X7.(m1\_subset\_1\ X7\ X2) \Rightarrow (r1\_sublemma\ X0\ X5 \\ & \quad X2\ (k1\_sublemma\ X0\ X2\ (k1\_sublemma\ X0\ X2\ X4\ (k13\_sublemma\ X0\ X5\ X1 \\ & \quad X6\ X2\ X4))\ (k12\_sublemma\ X0\ X2\ X1\ X7))\ X3)) \Leftrightarrow (\forall X7.(m1\_subset\_1 \\ & \quad X7\ X2) \Rightarrow (r1\_valuat\_1\ X0\ X2\ (k2\_sublemma\ X0\ X5)\ X3\ (k1\_sublemma\ X0 \\ & \quad X2\ (k1\_sublemma\ X0\ X2\ X4\ (k13\_sublemma\ X0\ X5\ X1\ X6\ X2\ X4))\ (k12\_sublemma \\ & \quad X0\ X2\ X1\ X7)))))))))) \end{aligned}$$