

t51_sublemma

(TMVuVft8Td5sU2TKxZdbguo5JXeXceYz9)

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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 $k16_subst1 : \iota \Rightarrow \iota$ 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 $v3_subst1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k10_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k7_subst1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k11_cqc_lang : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_sublemma : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k35_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k32_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_qc_lang3 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k13_subst1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k9_qc_lang1 : \iota \Rightarrow \iota$ be given. Let $k21_qc_lang1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k15_qc_lang1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k22_qc_lang1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k18_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k24_subst1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k23_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k22_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k19_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $k4_tarski : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_subst1 : \iota \Rightarrow \iota$ be given. Let $k34_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k33_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $k3_cqc_lang : \iota \Rightarrow \iota$ be given. Let $v1_sublemma : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_tarski : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_tarski : \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1 X0) \Rightarrow (\forall X1.(m2_subset_1 X1 (k2_qc_lang1 \\
& \quad X0) (k3_qc_lang1 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (k9_qc_lang1 \\
& \quad X0)) \Rightarrow ((k21_qc_lang1 X0 (k15_qc_lang1 X0 X1 X2) = X1) \wedge (k22_qc_lang1 \\
& \quad X0 (k15_qc_lang1 X0 X1 X2) = X2))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m1_subset_1\ X1\ (k2_zfmisc_1 \\ (k16_subst1\ X0)\ (k3_qc_lang1\ X0))) \Rightarrow (\forall X2.(m1_subst1 \\ X2\ X0\ X1) \Rightarrow ((v3_subst1\ X1\ X0) \Rightarrow ((k18_subst1\ X0\ (k24_subst1 \\ X0\ X1\ X2) = k15_qc_lang1\ X0\ (k23_subst1\ X0\ X1)\ (k18_subst1\ X0 \\ (k22_subst1\ X0\ X1))) \wedge (k19_subst1\ X0\ (k24_subst1\ X0\ X1\ X2) = \\ X2)))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((\neg v1_xboole_0\ X0) \wedge ((\neg v1_xboole_0\ X1) \wedge \\ (m1_subset_1\ X1\ (k1_zfmisc_1\ X0)))) \Rightarrow (\forall X2.(m2_subset_1 \\ X2\ X0\ X1) \Leftrightarrow (m1_subset_1\ X2\ X1)) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.((m1_qc_lang1\ X0) \wedge ((m1_subset_1 \\ X1\ (k38_subst1\ X0)) \wedge (m1_subset_1\ X2\ (k3_qc_lang1\ X0)))) \Rightarrow (k7_sublemma \\ X0\ X1\ X2 = k4_tarski\ X1\ X2) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((m1_qc_lang1\ X0) \wedge (m1_subset_1\ X1\ (k2_zfmisc_1 \\ (k9_qc_lang1\ X0)\ (k1_subst1\ X0)))) \Rightarrow (k34_subst1\ X0\ X1 = k2_xtuple_0 \\ X1) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((m1_qc_lang1\ X0) \wedge (m1_subset_1\ X1\ (k2_zfmisc_1 \\ (k9_qc_lang1\ X0)\ (k1_subst1\ X0)))) \Rightarrow (k33_subst1\ X0\ X1 = k1_xtuple_0 \\ X1) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((m1_qc_lang1\ X0) \wedge (m1_subset_1\ X1\ (k38_subst1 \\ X0))) \Rightarrow (k2_sublemma\ X0\ X1 = k1_xtuple_0\ X1) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((m1_qc_lang1\ X0) \wedge (m1_subset_1\ X1\ (k2_zfmisc_1 \\ (k16_subst1\ X0)\ (k3_qc_lang1\ X0)))) \Rightarrow (k23_subst1\ X0\ X1 = k2_xtuple_0 \\ X1) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((m1_qc_lang1\ X0) \wedge (m1_subset_1\ X1\ (k2_zfmisc_1 \\ (k16_subst1\ X0)\ (k3_qc_lang1\ X0)))) \Rightarrow (k22_subst1\ X0\ X1 = k1_xtuple_0 \\ X1) \end{aligned} \quad (9)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1\ X0)\wedge(m1_subset_1\ X1\ (k16_subst1\ X0)))\Rightarrow(k19_subst1\ X0\ X1 = k2_xtuple_0\ X1) \quad (10)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1\ X0)\wedge(m1_subset_1\ X1\ (k16_subst1\ X0)))\Rightarrow(k18_subst1\ X0\ X1 = k1_xtuple_0\ X1) \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((m1_qc_lang1\ X0)\wedge((m1_subset_1\ X1\ (k3_qc_lang1\ X0))\wedge(m1_subset_1\ X2\ (k3_cqc_lang\ X0))))\Rightarrow(k11_cqc_lang\ X0\ X1\ X2 = k15_qc_lang1\ X0\ X1\ X2) \quad (12)$$

Assume the following.

$$\forall X0.\forall X1.k2_xtuple_0\ (k4_tarski\ X0\ X1) = X1 \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.k1_xtuple_0\ (k4_tarski\ X0\ X1) = X0 \quad (14)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(\neg v1_xboole_0\ (k38_subst1\ X0)) \quad (15)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(\neg v1_xboole_0\ (k3_qc_lang1\ X0)) \quad (16)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(\neg v1_xboole_0\ (k3_cqc_lang\ X0)) \quad (17)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v1_xboole_0\ X0)\wedge((\neg v1_xboole_0\ X1)\wedge(m1_subset_1\ X1\ (k1_zfmisc_1\ X0))))\Rightarrow(\forall X2.(m2_subset_1\ X2\ X0\ X1)\Rightarrow(m1_subset_1\ X2\ X0)) \quad (18)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((m1_qc_lang1\ X0)\wedge((v1_sublemma\ X1\ X0)\wedge(m1_subset_1\ X1\ (k2_zfmisc_1\ (k16_subst1\ X0)\ (k3_qc_lang1\ X0))))\wedge(m1_subst1\ X2\ X0\ X1))\Rightarrow(m2_subset_1\ (k9_sublemma\ X0\ X1\ X2)\ (k16_subst1\ X0)\ (k38_subst1\ X0)) \quad (19)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((m1_qc_lang1\ X0)\wedge((m1_subset_1\ X1\ (k38_subst1\ X0))\wedge(m1_subset_1\ X2\ (k3_qc_lang1\ X0))))\Rightarrow((v1_sublemma\ (k7_sublemma\ X0\ X1\ X2)\ X0)\wedge(m1_subset_1\ (k7_sublemma\ X0\ X1\ X2)\ (k2_zfmisc_1\ (k16_subst1\ X0)\ (k3_qc_lang1\ X0)))) \quad (20)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(m1_subset_1\ (k3_qc_lang1\ X0)\ (k1_zfmisc_1\ (k2_qc_lang1\ X0))) \quad (21)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(m1_subset_1\ (k3_cqc_lang\ X0)\ (k1_zfmisc_1\ (k9_qc_lang1\ X0))) \quad (22)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(m1_subset_1\ (k38_subst1\ X0)\ (k1_zfmisc_1\ (k16_subst1\ X0))) \quad (23)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1\ X0)\wedge(m1_subset_1\ X1\ (k16_subst1\ X0)))\Rightarrow(m1_subset_1\ (k32_subst1\ X0\ X1)\ (k2_zfmisc_1\ (k9_qc_lang1\ X0)\ (k1_subst1\ X0))) \quad (24)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1\ X0)\wedge(m1_subset_1\ X1\ (k38_subst1\ X0)))\Rightarrow(m2_subset_1\ (k2_sublemma\ X0\ X1)\ (k9_qc_lang1\ X0)\ (k3_cqc_lang\ X0)) \quad (25)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1\ X0)\wedge(m1_subset_1\ X1\ (k16_subst1\ X0)))\Rightarrow(m1_subset_1\ (k18_subst1\ X0\ X1)\ (k9_qc_lang1\ X0)) \quad (26)$$

Assume the following.

$$\forall X0.\forall X1.k4_tarski\ X0\ X1 = k2_tarski\ (k2_tarski\ X0\ X1)\ (k1_tarski\ X0) \quad (27)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(\forall X1.((v1_sublemma\ X1\ X0)\wedge(m1_subset_1\ X1\ (k2_zfmisc_1\ (k16_subst1\ X0)\ (k3_qc_lang1\ X0))))\Rightarrow(\forall X2.(m1_subst1\ X2\ X0\ X1)\Rightarrow((v3_subst1\ X1\ X0)\Rightarrow(k9_sublemma\ X0\ X1\ X2 = k24_subst1\ X0\ X1\ X2)))) \quad (28)$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m1_subset_1\ X1\ (k2_zfmisc_1 \\
& (k9_qc_lang1\ X0)\ (k1_subst1\ X0))) \Rightarrow (((k21_qc_lang1\ X0\ (k33_subst1 \\
& X0\ X1) \in k10_xtuple_0\ (k7_subst1\ X0\ (k21_qc_lang1\ X0\ (k33_subst1 \\
& X0\ X1))\ (k33_subst1\ X0\ X1))\ (k34_subst1\ X0\ X1))) \Rightarrow (k35_subst1 \\
& X0\ X1 = k2_qc_lang3\ X0\ (k13_subst1\ X0\ (k7_subst1\ X0\ (k21_qc_lang1 \\
& X0\ (k33_subst1\ X0\ X1))\ (k33_subst1\ X0\ X1))\ (k34_subst1\ X0\ X1)) \\
& (k22_qc_lang1\ X0\ (k33_subst1\ X0\ X1)))) \wedge ((\neg k21_qc_lang1\ X0 \\
& (k33_subst1\ X0\ X1) \in k10_xtuple_0\ (k7_subst1\ X0\ (k21_qc_lang1 \\
& X0\ (k33_subst1\ X0\ X1))\ (k33_subst1\ X0\ X1))\ (k34_subst1\ X0\ X1))) \Rightarrow \\
& (k35_subst1\ X0\ X1 = k21_qc_lang1\ X0\ (k33_subst1\ X0\ X1))))
\end{aligned} \tag{29}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m1_subset_1\ X1\ (k16_subst1 \\
& X0)) \Rightarrow (k32_subst1\ X0\ X1 = X1))
\end{aligned} \tag{30}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(v1_xboole_0\ X0) \Rightarrow (\forall X1.(m1_subset_1\ X1\ (k1_zfmisc_1 \\
& X0)) \Rightarrow (v1_xboole_0\ X1))
\end{aligned} \tag{31}$$

Theorem 1

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m2_subset_1\ X1\ (k2_qc_lang1 \\
& X0)\ (k3_qc_lang1\ X0)) \Rightarrow (\forall X2.(m2_subset_1\ X2\ (k16_subst1 \\
& X0)\ (k38_subst1\ X0)) \Rightarrow (\forall X3.(m1_subst1\ X3\ X0\ (k7_sublemma \\
& X0\ X2\ X1)) \Rightarrow (((v3_subst1\ (k7_sublemma\ X0\ X2\ X1)\ X0) \wedge (X1 \in k10_xtuple_0 \\
& (k7_subst1\ X0\ X1\ (k11_cqc_lang\ X0\ X1\ (k2_sublemma\ X0\ X2))\ X3))) \Rightarrow \\
& (k35_subst1\ X0\ (k32_subst1\ X0\ (k9_sublemma\ X0\ (k7_sublemma \\
& X0\ X2\ X1)\ X3)) = k2_qc_lang3\ X0\ (k13_subst1\ X0\ (k7_subst1\ X0\ X1 \\
& (k11_cqc_lang\ X0\ X1\ (k2_sublemma\ X0\ X2))\ X3)\ (k2_sublemma\ X0\ X2))))))
\end{aligned}$$