

t17_sublemma (TMVwyKoXphY- BuwiLLpvxUiAvgeaLTmkjTKV)

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Let $m1_qc_lang1 : \iota \Rightarrow o$ 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 $k3_qc_lang1 : \iota \Rightarrow \iota$ be given. Let $k2_valuat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $r1_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_sublemma : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_sublemma : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9_qc_lang1 : \iota \Rightarrow \iota$ be given. Let $k3_cqc_lang : \iota \Rightarrow \iota$ be given. Let $r1_valuat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k6_cqc_lang : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k18_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k20_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_sublemma : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k19_subst1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ 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 $k1_xtuple_0 : \iota \Rightarrow \iota$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_funct_4 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1 X0) \Rightarrow (\forall X1.(\neg v1_xboole_0 X1) \Rightarrow (\\
& \forall X2.(m2_funct_2 X2 (k3_qc_lang1 X0) X1 (k2_valuat_1 X0 X1)) \Rightarrow \\
& (\forall X3.(m2_subset_1 X3 (k9_qc_lang1 X0) (k3_cqc_lang X0)) \Rightarrow \\
& (\forall X4.(m1_valuat_1 X4 X0 X1) \Rightarrow ((r1_valuat_1 X0 X1 (k6_cqc_lang \\
& X0 X3) X4 X2) \Leftrightarrow (\neg r1_valuat_1 X0 X1 X3 X4 X2)))))) \tag{1}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1 X0) \Rightarrow (\forall X1.(m2_subset_1 X1 (k16_subst1 \\
& X0) (k38_subst1 X0)) \Rightarrow ((k18_subst1 X0 (k20_subst1 X0 X1) = \\
& k6_cqc_lang X0 (k2_sublemma X0 X1)) \wedge (k19_subst1 X0 (k20_subst1 \\
& X0 X1) = k19_subst1 X0 X1))) \tag{2}
\end{aligned}$$

Assume the following.

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

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1_xboole_0 X1)\wedge(m1_funct_2 X2 X0 X1))\Rightarrow(\forall X3.(m2_funct_2 X3 X0 X1 X2)\Leftrightarrow(m1_subset_1 X3 X2)) \quad (4)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1 X0)\wedge(m1_subset_1 X1 (k38_subst1 X0)))\Rightarrow(k5_sublemma X0 X1 = k20_subst1 X0 X1) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1 X0)\wedge(m1_subset_1 X1 (k38_subst1 X0)))\Rightarrow(k2_sublemma X0 X1 = k1_xtuple_0 X1) \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.((m1_qc_lang1 X0)\wedge((\neg v1_xboole_0 X1)\wedge((m1_subset_1 X2 (k2_valuat_1 X0 X1))\wedge((v1_funct_1 X3)\wedge(m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 (k3_qc_lang1 X0) X1)))))))\Rightarrow(k1_sublemma X0 X1 X2 X3 = k1_funct_4 X2 X3) \quad (7)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1 X0)\wedge(m1_subset_1 X1 (k16_subst1 X0)))\Rightarrow(k18_subst1 X0 X1 = k1_xtuple_0 X1) \quad (8)$$

Assume the following.

$$\forall X0.(m1_qc_lang1 X0)\Rightarrow(\neg v1_xboole_0 (k38_subst1 X0)) \quad (9)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v1_xboole_0 X0)\wedge((\neg v1_xboole_0 X1)\wedge(m1_subset_1 X1 (k1_zfmisc_1 X0))))\Rightarrow(\forall X2.(m2_subset_1 X2 X0 X1)\Rightarrow(m1_subset_1 X2 X0)) \quad (10)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1 X0)\wedge(m1_subset_1 X1 (k38_subst1 X0)))\Rightarrow(m2_subset_1 (k5_sublemma X0 X1) (k16_subst1 X0) (k38_subst1 X0)) \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.((m1_qc_lang1 X0)\wedge((m1_subset_1 X1 (k38_subst1 X0))\wedge((\neg v1_xboole_0 X2)\wedge(m1_subset_1 X3 (k2_valuat_1 X0 X2)))))\Rightarrow((v1_funct_1 (k3_sublemma X0 X1 X2 X3))\wedge(m1_subset_1 (k3_sublemma X0 X1 X2 X3) (k1_zfmisc_1 (k2_zfmisc_1 (k3_qc_lang1 X0) X2)))) \quad (12)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(m1_subset_1\ (k38_subst1\ X0)\ (k1_zfmisc_1\ (k16_subst1\ X0))) \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1\ X0)\wedge(\neg v1_xboole_0\ X1))\Rightarrow(m1_funct_2\ (k2_valuat_1\ X0\ X1)\ (k3_qc_lang1\ X0)\ X1) \quad (14)$$

Assume the following.

$$\forall X0.\forall X1.((m1_qc_lang1\ X0)\wedge(m1_subset_1\ X1\ (k38_subst1\ X0)))\Rightarrow(m2_subset_1\ (k2_sublemma\ X0\ X1)\ (k9_qc_lang1\ X0)\ (k3_cqc_lang\ X0)) \quad (15)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.((m1_qc_lang1\ X0)\wedge((\neg v1_xboole_0\ X1)\wedge((m1_subset_1\ X2\ (k2_valuat_1\ X0\ X1))\wedge((v1_funct_1\ X3)\wedge(m1_subset_1\ X3\ (k1_zfmisc_1\ (k2_zfmisc_1\ (k3_qc_lang1\ X0)\ X1)))))))\Rightarrow(m2_funct_2\ (k1_sublemma\ X0\ X1\ X2\ X3)\ (k3_qc_lang1\ X0)\ X1\ (k2_valuat_1\ X0\ X1)) \quad (16)$$

Assume the following.

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(\forall X1.(m2_subset_1\ X1\ (k16_subst1\ X0)\ (k38_subst1\ X0))\Rightarrow(\forall X2.(\neg v1_xboole_0\ X2)\Rightarrow(\forall X3.(m2_funct_2\ X3\ (k3_qc_lang1\ X0)\ X2\ (k2_valuat_1\ X0\ X2))\Rightarrow(\forall X4.(m1_valuat_1\ X4\ X0\ X2)\Rightarrow((r1_sublemma\ X0\ X1\ X2\ X3\ X4)\Leftrightarrow(r1_valuat_1\ X0\ X2\ (k2_sublemma\ X0\ X1)\ X4\ X3)))))) \quad (17)$$

Assume the following.

$$\forall X0.(v1_xboole_0\ X0)\Rightarrow(\forall X1.(m1_subset_1\ X1\ (k1_zfmisc_1\ X0))\Rightarrow(v1_xboole_0\ X1)) \quad (18)$$

Theorem 1

$$\forall X0.(m1_qc_lang1\ X0)\Rightarrow(\forall X1.(\neg v1_xboole_0\ X1)\Rightarrow(\forall X2.(m1_valuat_1\ X2\ X0\ X1)\Rightarrow(\forall X3.(m2_funct_2\ X3\ (k3_qc_lang1\ X0)\ X1\ (k2_valuat_1\ X0\ X1))\Rightarrow(\forall X4.(m2_subset_1\ X4\ (k16_subst1\ X0)\ (k38_subst1\ X0))\Rightarrow((\neg r1_sublemma\ X0\ X4\ X1\ (k1_sublemma\ X0\ X1\ X3\ (k3_sublemma\ X0\ X4\ X1\ X3))\ X2)\Leftrightarrow(r1_sublemma\ X0\ (k5_sublemma\ X0\ X4)\ X1\ (k1_sublemma\ X0\ X1\ X3\ (k3_sublemma\ X0\ X4\ X1\ X3))\ X2))))))$$