

t68_sublemma

(TMVr2Vmfvnn4Jn9PC4DLCMhR5yW6F6agM2z)

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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 $m2_subset_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k9_qc_lang1 : \iota \Rightarrow \iota$ be given. Let $k3_cqc_lang : \iota \Rightarrow \iota$ be given. Let $m2_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_qc_lang1 : \iota \Rightarrow \iota$ be given. Let $k2_valuat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r2_relset_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_relset_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k24_qc_lang1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1_valuat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_qc_lang1 : \iota \Rightarrow \iota$ be given. Let $k11_cqc_lang : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_cqc_lang : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_cqc_lang : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_numbers : \iota$ be given. Let $k6_qc_lang1 : \iota \Rightarrow \iota$ be given. Let $k8_qc_lang1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v5_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v3_card_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m2_finseq_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k4_cqc_lang : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_cqc_lang : \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.(m1_qc_lang1 X0) \Rightarrow (\forall X1.(m2_subset_1 X1 (k9_qc_lang1 \\
 & X0) (k3_cqc_lang X0)) \Rightarrow (\forall X2.(m2_subset_1 X2 (k2_qc_lang1 \\
 & X0) (k3_qc_lang1 X0)) \Rightarrow (\forall X3.(\neg v1_xboole_0 X3) \Rightarrow (\forall X4. \\
 & (m1_valuat_1 X4 X0 X3) \Rightarrow ((\forall X5.(m2_funct_2 X5 (k3_qc_lang1 \\
 & X0) X3 (k2_valuat_1 X0 X3)) \Rightarrow (\forall X6.(m2_funct_2 X6 (k3_qc_lang1 \\
 & X0) X3 (k2_valuat_1 X0 X3)) \Rightarrow ((r2_relset_1 (k3_qc_lang1 X0) X3 (\\
 & k5_relset_1 (k3_qc_lang1 X0) X3 X5 (k24_qc_lang1 X0 X1)) (k5_relset_1 \\
 & (k3_qc_lang1 X0) X3 X6 (k24_qc_lang1 X0 X1))) \Rightarrow ((r1_valuat_1 X0 \\
 & X3 X1 X4 X5) \Leftrightarrow (r1_valuat_1 X0 X3 X1 X4 X6)))))) \Rightarrow (\forall X5.(m2_funct_2 \\
 & X5 (k3_qc_lang1 X0) X3 (k2_valuat_1 X0 X3)) \Rightarrow (\forall X6.(m2_funct_2 \\
 & X6 (k3_qc_lang1 X0) X3 (k2_valuat_1 X0 X3)) \Rightarrow ((r2_relset_1 (k3_qc_lang1 \\
 & X0) X3 (k5_relset_1 (k3_qc_lang1 X0) X3 X5 (k24_qc_lang1 X0 (k11_cqc_lang \\
 & X0 X2 X1)) (k5_relset_1 (k3_qc_lang1 X0) X3 X6 (k24_qc_lang1 X0 \\
 & (k11_cqc_lang X0 X2 X1)))) \Rightarrow ((r1_valuat_1 X0 X3 (k11_cqc_lang X0 \\
 & X2 X1) X4 X5) \Leftrightarrow (r1_valuat_1 X0 X3 (k11_cqc_lang X0 X2 X1) X4 X6)))))))))
 \end{aligned}$$

(1)

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m2_subset_1\ X1\ (k9_qc_lang1 \\
& \quad X0)\ (k3_cqc_lang\ X0)) \Rightarrow (\forall X2.(m2_subset_1\ X2\ (k9_qc_lang1 \\
& \quad X0)\ (k3_cqc_lang\ X0)) \Rightarrow (\forall X3.(\neg v1_xboole_0\ X3) \Rightarrow (\forall X4. \\
& \quad (m1_valuat_1\ X4\ X0\ X3) \Rightarrow (((\forall X5.(m2_funct_2\ X5\ (k3_qc_lang1 \\
& \quad X0)\ X3\ (k2_valuat_1\ X0\ X3)) \Rightarrow (\forall X6.(m2_funct_2\ X6\ (k3_qc_lang1 \\
& \quad X0)\ X3\ (k2_valuat_1\ X0\ X3)) \Rightarrow ((r2_relset_1\ (k3_qc_lang1\ X0)\ X3\ (\\
& \quad k5_relset_1\ (k3_qc_lang1\ X0)\ X3\ X5\ (k24_qc_lang1\ X0\ X1))\ (k5_relset_1 \\
& \quad (k3_qc_lang1\ X0)\ X3\ X6\ (k24_qc_lang1\ X0\ X1)))) \Rightarrow ((r1_valuat_1\ X0 \\
& \quad X3\ X1\ X4\ X5) \Leftrightarrow (r1_valuat_1\ X0\ X3\ X1\ X4\ X6)))) \wedge (\forall X5.(m2_funct_2 \\
& \quad X5\ (k3_qc_lang1\ X0)\ X3\ (k2_valuat_1\ X0\ X3)) \Rightarrow (\forall X6.(m2_funct_2 \\
& \quad X6\ (k3_qc_lang1\ X0)\ X3\ (k2_valuat_1\ X0\ X3)) \Rightarrow ((r2_relset_1\ (k3_qc_lang1 \\
& \quad X0)\ X3\ (k5_relset_1\ (k3_qc_lang1\ X0)\ X3\ X5\ (k24_qc_lang1\ X0\ X2)) \\
& \quad (k5_relset_1\ (k3_qc_lang1\ X0)\ X3\ X6\ (k24_qc_lang1\ X0\ X2)))) \Rightarrow ((r1_valuat_1 \\
& \quad X0\ X3\ X2\ X4\ X5) \Leftrightarrow (r1_valuat_1\ X0\ X3\ X2\ X4\ X6)))) \Rightarrow (\forall X5.(m2_funct_2 \\
& \quad X5\ (k3_qc_lang1\ X0)\ X3\ (k2_valuat_1\ X0\ X3)) \Rightarrow (\forall X6.(m2_funct_2 \\
& \quad X6\ (k3_qc_lang1\ X0)\ X3\ (k2_valuat_1\ X0\ X3)) \Rightarrow ((r2_relset_1\ (k3_qc_lang1 \\
& \quad X0)\ X3\ (k5_relset_1\ (k3_qc_lang1\ X0)\ X3\ X5\ (k24_qc_lang1\ X0\ (k7_cqc_lang \\
& \quad X0\ X1\ X2)))\ (k5_relset_1\ (k3_qc_lang1\ X0)\ X3\ X6\ (k24_qc_lang1\ X0 \\
& \quad (k7_cqc_lang\ X0\ X1\ X2)))) \Rightarrow ((r1_valuat_1\ X0\ X3\ (k7_cqc_lang\ X0\ X1 \\
& \quad X2)\ X4\ X5) \Leftrightarrow (r1_valuat_1\ X0\ X3\ (k7_cqc_lang\ X0\ X1\ X2)\ X4\ X6))))))))) \\
& \hspace{15em} (2)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m2_subset_1\ X1\ (k9_qc_lang1 \\
& \quad X0)\ (k3_cqc_lang\ X0)) \Rightarrow (\forall X2.(\neg v1_xboole_0\ X2) \Rightarrow (\forall X3. \\
& \quad (m1_valuat_1\ X3\ X0\ X2) \Rightarrow (((\forall X4.(m2_funct_2\ X4\ (k3_qc_lang1 \\
& \quad X0)\ X2\ (k2_valuat_1\ X0\ X2)) \Rightarrow (\forall X5.(m2_funct_2\ X5\ (k3_qc_lang1 \\
& \quad X0)\ X2\ (k2_valuat_1\ X0\ X2)) \Rightarrow ((r2_relset_1\ (k3_qc_lang1\ X0)\ X2\ (\\
& \quad k5_relset_1\ (k3_qc_lang1\ X0)\ X2\ X4\ (k24_qc_lang1\ X0\ X1))\ (k5_relset_1 \\
& \quad (k3_qc_lang1\ X0)\ X2\ X5\ (k24_qc_lang1\ X0\ X1)))) \Rightarrow ((r1_valuat_1\ X0 \\
& \quad X2\ X1\ X3\ X4) \Leftrightarrow (r1_valuat_1\ X0\ X2\ X1\ X3\ X5)))) \Rightarrow (\forall X4.(m2_funct_2 \\
& \quad X4\ (k3_qc_lang1\ X0)\ X2\ (k2_valuat_1\ X0\ X2)) \Rightarrow (\forall X5.(m2_funct_2 \\
& \quad X5\ (k3_qc_lang1\ X0)\ X2\ (k2_valuat_1\ X0\ X2)) \Rightarrow ((r2_relset_1\ (k3_qc_lang1 \\
& \quad X0)\ X2\ (k5_relset_1\ (k3_qc_lang1\ X0)\ X2\ X4\ (k24_qc_lang1\ X0\ (k6_cqc_lang \\
& \quad X0\ X1)))\ (k5_relset_1\ (k3_qc_lang1\ X0)\ X2\ X5\ (k24_qc_lang1\ X0\ (k6_cqc_lang \\
& \quad X0\ X1)))) \Rightarrow ((r1_valuat_1\ X0\ X2\ (k6_cqc_lang\ X0\ X1)\ X3\ X4) \Leftrightarrow (r1_valuat_1 \\
& \quad X0\ X2\ (k6_cqc_lang\ X0\ X1)\ X3\ X5))))))))) \\
& \hspace{15em} (3)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m1_subset_1\ X1\ k5_numbers) \Rightarrow \\
& \quad (\forall X2.(\neg v1_xboole_0\ X2) \Rightarrow (\forall X3.(m1_valuat_1\ X3\ X0 \\
& \quad X2) \Rightarrow (\forall X4.(m2_subset_1\ X4\ (k6_qc_lang1\ X0)\ (k8_qc_lang1 \\
& \quad X0\ X1)) \Rightarrow (\forall X5.((v5_relat_1\ X5\ (k3_qc_lang1\ X0)) \wedge ((v3_card_1 \\
& \quad X5\ X1) \wedge (m2_finseq_1\ X5\ (k2_qc_lang1\ X0)))) \Rightarrow (\forall X6.(m2_funct_2 \\
& \quad X6\ (k3_qc_lang1\ X0)\ X2\ (k2_valuat_1\ X0\ X2)) \Rightarrow (\forall X7.(m2_funct_2 \\
& \quad X7\ (k3_qc_lang1\ X0)\ X2\ (k2_valuat_1\ X0\ X2)) \Rightarrow ((r2_relset_1\ (k3_qc_lang1 \\
& \quad X0)\ X2\ (k5_relset_1\ (k3_qc_lang1\ X0)\ X2\ X6\ (k24_qc_lang1\ X0\ (k4_cqc_lang \\
& \quad X1\ X0\ X4\ X5)))\ (k5_relset_1\ (k3_qc_lang1\ X0)\ X2\ X7\ (k24_qc_lang1 \\
& \quad X0\ (k4_cqc_lang\ X1\ X0\ X4\ X5)))) \Rightarrow ((r1_valuat_1\ X0\ X2\ (k4_cqc_lang \\
& \quad X1\ X0\ X4\ X5)\ X3\ X6) \Leftrightarrow (r1_valuat_1\ X0\ X2\ (k4_cqc_lang\ X1\ X0\ X4\ X5)\ X3\ X7))))))))) \\
& \hspace{15em} (4)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(\neg v1_xboole_0\ X1) \Rightarrow (\\
& \quad \forall X2.(m2_funct_2\ X2\ (k3_qc_lang1\ X0)\ X1\ (k2_valuat_1\ X0\ X1)) \Rightarrow \\
& \quad (\forall X3.(m1_valuat_1\ X3\ X0\ X1) \Rightarrow (r1_valuat_1\ X0\ X1\ (k5_cqc_lang \\
& \quad X0)\ X3\ X2)))) \\
& \hspace{15em} (5)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0 : \iota \Rightarrow o. \forall X1. (\forall X2.(m2_subset_1\ X2\ (\\
& \quad k9_qc_lang1\ X1)\ (k3_cqc_lang\ X1)) \Rightarrow (\forall X3.(m2_subset_1\ X3 \\
& \quad (k9_qc_lang1\ X1)\ (k3_cqc_lang\ X1)) \Rightarrow (\forall X4.(m2_subset_1 \\
& \quad X4\ (k2_qc_lang1\ X1)\ (k3_qc_lang1\ X1)) \Rightarrow (\forall X5.(m1_subset_1 \\
& \quad X5\ k5_numbers) \Rightarrow (\forall X6.((v5_relat_1\ X6\ (k3_qc_lang1\ X1)) \wedge \\
& \quad ((v3_card_1\ X6\ X5) \wedge (m2_finseq_1\ X6\ (k2_qc_lang1\ X1)))) \Rightarrow (\forall X7. \\
& \quad (m2_subset_1\ X7\ (k6_qc_lang1\ X1)\ (k8_qc_lang1\ X1\ X5)) \Rightarrow ((X0\ (k5_cqc_lang \\
& \quad X1)) \wedge ((X0\ (k4_cqc_lang\ X5\ X1\ X7\ X6)) \wedge (((X0\ X2) \Rightarrow (X0\ (k6_cqc_lang \\
& \quad X1\ X2))) \wedge (((X0\ X2) \wedge (X0\ X3)) \Rightarrow (X0\ (k7_cqc_lang\ X1\ X2\ X3))) \wedge ((X0 \\
& \quad X2) \Rightarrow (X0\ (k11_cqc_lang\ X1\ X4\ X2))))))))) \Rightarrow (\forall X2.(m2_subset_1 \\
& \quad X2\ (k9_qc_lang1\ X1)\ (k3_cqc_lang\ X1)) \Rightarrow (X0\ X2)) \\
& \hspace{15em} (6)
\end{aligned}$$

Theorem 1

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(\neg v1_xboole_0\ X1) \Rightarrow (\\
& \quad \forall X2.(m1_valuat_1\ X2\ X0\ X1) \Rightarrow (\forall X3.(m2_subset_1\ X3 \\
& \quad (k9_qc_lang1\ X0)\ (k3_cqc_lang\ X0)) \Rightarrow (\forall X4.(m2_funct_2\ X4 \\
& \quad (k3_qc_lang1\ X0)\ X1\ (k2_valuat_1\ X0\ X1)) \Rightarrow (\forall X5.(m2_funct_2 \\
& \quad X5\ (k3_qc_lang1\ X0)\ X1\ (k2_valuat_1\ X0\ X1)) \Rightarrow ((r2_relset_1\ (k3_qc_lang1 \\
& \quad X0)\ X1\ (k5_relset_1\ (k3_qc_lang1\ X0)\ X1\ X4\ (k24_qc_lang1\ X0\ X3)) \\
& \quad (k5_relset_1\ (k3_qc_lang1\ X0)\ X1\ X5\ (k24_qc_lang1\ X0\ X3))) \Rightarrow ((r1_valuat_1 \\
& \quad X0\ X1\ X3\ X2\ X4) \Leftrightarrow (r1_valuat_1\ X0\ X1\ X3\ X2\ X5))))))))) \\
& \hspace{15em} (6)
\end{aligned}$$