

t12_substut2 (TMYVkQD- inzQbF4oSKph5WukWg5BXp5sTtwm)

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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 $k9_qc_lang1 : \iota \Rightarrow \iota$ be given. Let $k3_cqc_lang : \iota \Rightarrow \iota$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_substut1 : \iota \Rightarrow \iota$ be given. Let $k16_substut1 : \iota \Rightarrow \iota$ be given. Let $k38_substut1 : \iota \Rightarrow \iota$ be given. Let $k2_sublemma : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k19_substut1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $k5_numbers : \iota$ 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 $k3_qc_lang1 : \iota \Rightarrow \iota$ 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 $k2_qc_lang1 : \iota \Rightarrow \iota$ 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. Let $k11_cqc_lang : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.(m1_qc_lang1 X0) \Rightarrow (\forall X1.(m2_subset_1 X1 (k9_qc_lang1 \\
 & \quad X0) (k3_cqc_lang X0)) \Rightarrow (\forall X2.(m2_subset_1 X2 (k9_qc_lang1 \\
 & \quad X0) (k3_cqc_lang X0)) \Rightarrow ((\forall X3.(m1_subset_1 X3 (k1_substut1 \\
 & \quad X0)) \Rightarrow (\exists X4.(m2_subset_1 X4 (k16_substut1 X0) (k38_substut1 \\
 & \quad X0)) \wedge ((k2_sublemma X0 X4 = X1) \wedge (k19_substut1 X0 X4 = X3)))) \wedge (\forall X3. \\
 & \quad (m1_subset_1 X3 (k1_substut1 X0)) \Rightarrow (\exists X4.(m2_subset_1 X4 \\
 & \quad (k16_substut1 X0) (k38_substut1 X0)) \wedge ((k2_sublemma X0 X4 = X2) \wedge \\
 & \quad (k19_substut1 X0 X4 = X3)))) \Rightarrow (\forall X3.(m1_subset_1 X3 (k1_substut1 \\
 & \quad X0)) \Rightarrow (\exists X4.(m2_subset_1 X4 (k16_substut1 X0) (k38_substut1 \\
 & \quad X0)) \wedge ((k2_sublemma X0 X4 = k7_cqc_lang X0 X1 X2) \wedge (k19_substut1 \\
 & \quad X0 X4 = X3))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0.(m1_qc_lang1 X0) \Rightarrow (\forall X1.(m2_subset_1 X1 (k9_qc_lang1 \\
 & \quad X0) (k3_cqc_lang X0)) \Rightarrow ((\forall X2.(m1_subset_1 X2 (k1_substut1 \\
 & \quad X0)) \Rightarrow (\exists X3.(m2_subset_1 X3 (k16_substut1 X0) (k38_substut1 \\
 & \quad X0)) \wedge ((k2_sublemma X0 X3 = X1) \wedge (k19_substut1 X0 X3 = X2)))) \Rightarrow (\forall X2. \\
 & \quad (m1_subset_1 X2 (k1_substut1 X0)) \Rightarrow (\exists X3.(m2_subset_1 X3 \\
 & \quad (k16_substut1 X0) (k38_substut1 X0)) \wedge ((k2_sublemma X0 X3 = k6_cqc_lang \\
 & \quad X0 X1) \wedge (k19_substut1 X0 X3 = X2))))))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m1_subset_1\ X1\ k5_numbers) \Rightarrow \\
& (\forall X2.(m2_subset_1\ X2\ (k6_qc_lang1\ X0)\ (k8_qc_lang1\ X0\ X1)) \Rightarrow \\
& (\forall X3.((v5_relat_1\ X3\ (k3_qc_lang1\ X0)) \wedge ((v3_card_1\ X3 \\
& X1) \wedge (m2_finseq_1\ X3\ (k2_qc_lang1\ X0)))) \Rightarrow (\forall X4.(m1_subset_1 \\
& X4\ (k1_subst1\ X0)) \Rightarrow (\exists X5.(m2_subset_1\ X5\ (k16_subst1 \\
& X0)\ (k38_subst1\ X0)) \wedge ((k2_sublemma\ X0\ X5 = k4_cqc_lang\ X1\ X0\ X2 \\
& X3) \wedge (k19_subst1\ X0\ X5 = X4))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m1_subset_1\ X1\ (k1_subst1 \\
& X0)) \Rightarrow (\exists X2.(m2_subset_1\ X2\ (k16_subst1\ X0)\ (k38_subst1 \\
& X0)) \wedge ((k2_sublemma\ X0\ X2 = k5_cqc_lang\ X0) \wedge (k19_subst1\ X0\ X2 = \\
& X1))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m2_subset_1\ X1\ (k9_qc_lang1 \\
& X0)\ (k3_cqc_lang\ X0)) \Rightarrow (\forall X2.(m2_subset_1\ X2\ (k2_qc_lang1 \\
& X0)\ (k3_qc_lang1\ X0)) \Rightarrow ((\forall X3.(m1_subset_1\ X3\ (k1_subst1 \\
& X0)) \Rightarrow (\exists X4.(m2_subset_1\ X4\ (k16_subst1\ X0)\ (k38_subst1 \\
& X0)) \wedge ((k2_sublemma\ X0\ X4 = X1) \wedge (k19_subst1\ X0\ X4 = X3)))) \Rightarrow (\forall X3. \\
& (m1_subset_1\ X3\ (k1_subst1\ X0)) \Rightarrow (\exists X4.(m2_subset_1\ X4 \\
& (k16_subst1\ X0)\ (k38_subst1\ X0)) \wedge ((k2_sublemma\ X0\ X4 = k11_cqc_lang \\
& X0\ X2\ X1) \wedge (k19_subst1\ X0\ X4 = X3))))))
\end{aligned} \tag{5}$$

Assume the following.

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

Theorem 1

$$\begin{aligned}
& \forall X0.(m1_qc_lang1\ X0) \Rightarrow (\forall X1.(m2_subset_1\ X1\ (k9_qc_lang1 \\
& X0)\ (k3_cqc_lang\ X0)) \Rightarrow (\forall X2.(m1_subset_1\ X2\ (k1_subst1 \\
& X0)) \Rightarrow (\exists X3.(m2_subset_1\ X3\ (k16_subst1\ X0)\ (k38_subst1 \\
& X0)) \wedge ((k2_sublemma\ X0\ X3 = X1) \wedge (k19_subst1\ X0\ X3 = X2))))
\end{aligned}$$