

t10_scmisort
(TMYH1Rn49rViMkMHbpcafgbj2ubyhPqwdFa)

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Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v4_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_numbers : \iota$ be given. Let $v5_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_compos_1 : \iota \Rightarrow \iota$ be given. Let $k1_scmf_sa_2 : \iota$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_ami_2 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $v1_finset_1 : \iota \Rightarrow o$ be given. Let $v1_afinsq_1 : \iota \Rightarrow o$ be given. Let $v5_funct_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_memstr_0 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $np_3 : \iota$ be given. Let $r1_scm_halt : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2_scm_halt : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_memstr_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_extpro_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_funct_4 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_scmf_sa_9 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_scmf_sa_m : \iota \Rightarrow \iota$ be given. Let $k2_nat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $np_1 : \iota$ be given. Let $k8_extpro_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $np_4 : \iota$ be given. Let $k3_extpro_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k11_scmf_sa_2 : \iota \Rightarrow \iota$ be given. Let $k5_card_1 : \iota \Rightarrow \iota$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_scmf_sa_2 : \iota \Rightarrow \iota$ be given. Let $k6_numbers : \iota$ be given. Let $r5_scmf_sa7b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r6_scmf_sa7b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k8_memstr_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0. ((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmf_sa_2)) \wedge \\ & ((v1_funct_1 X0) \wedge (v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmf_sa_2)))))) \Rightarrow \\ & (k1_funct_1 (k1_scmf_sa_m X0) (k4_scmf_sa_2 k6_numbers) = np_1) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_ami_2 X1) \wedge (m1_subset_1 \\
& X1 (u1_struct_0 k1_scmf_sa_2))) \Rightarrow (\forall X2.((v1_relat_1 X2) \wedge \\
& ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 k1_scmf_sa_2)) \wedge \\
& ((\neg v1_xboole_0 X2) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2))))))) \Rightarrow (\forall X3.((v1_relat_1 X3) \wedge ((v4_relat_1 X3 (u1_struct_0 \\
& k1_scmf_sa_2)) \wedge ((v1_funct_1 X3) \wedge ((v5_funct_1 X3 (k2_memstr_0 \\
& np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 X3 (u1_struct_0 k1_scmf_sa_2)))))) \Rightarrow \\
& (((r5_scmf_sa_7b X2 X3 X0) \wedge ((r6_scmf_sa_7b X2 X3 X0) \wedge (k5_memstr_0 \\
& np_3 k1_scmf_sa_2 (k5_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 \\
& X0 (k2_scmf_sa_9 X1 X2)) (k8_memstr_0 np_3 k1_scmf_sa_2 X3) (k2_nat_1 \\
& np_1 (k8_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 X0 X2) (k8_memstr_0 \\
& np_3 k1_scmf_sa_2 X3)))) = k2_nat_1 (k5_memstr_0 np_3 k1_scmf_sa_2 \\
& (k5_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 X0 X2) (k8_memstr_0 \\
& np_3 k1_scmf_sa_2 X3) (k8_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 \\
& X0 X2) (k8_memstr_0 np_3 k1_scmf_sa_2 X3)))) np_4))) \Rightarrow (k3_extpro_1 \\
& np_3 k1_scmf_sa_2 (k1_funct_4 X0 (k2_scmf_sa_9 X1 X2)) (k5_extpro_1 \\
& np_3 k1_scmf_sa_2 (k1_funct_4 X0 (k2_scmf_sa_9 X1 X2)) (k8_memstr_0 \\
& np_3 k1_scmf_sa_2 X3) (k2_nat_1 np_1 (k8_extpro_1 np_3 k1_scmf_sa_2 \\
& (k1_funct_4 X0 X2) (k8_memstr_0 np_3 k1_scmf_sa_2 X3)))) = k11_scmf_sa_2 \\
& (k2_nat_1 (k5_card_1 X2) np_4))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmf_sa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmf_sa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmf_sa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2))))))) \Rightarrow ((r2_scm_halt X2 X1 X0) \Leftrightarrow (r6_scmf_sa_7b X2 (k1_scmf_sa_m \\
& X1) X0)))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmf_sa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmf_sa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmf_sa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2)))))) \Rightarrow ((r1_scm_halt X2 X1 X0) \Leftrightarrow (r5_scmf_sa7b X2 (k1_scmf_sa_m \\
& X1) X0)))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmf_sa_2)) \wedge \\
& ((v1_funct_1 X0) \wedge ((v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge \\
& (v1_partfun1 X0 (u1_struct_0 k1_scmf_sa_2)))))) \Rightarrow ((k1_funct_1 \\
& X0 (k4_scmf_sa_2 k6_numbers) = np_1) \Rightarrow (k8_memstr_0 np_3 k1_scmf_sa_2 \\
& X0 = k1_scmf_sa_m X0))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmf_sa_2)) \wedge \\
& ((v1_funct_1 X0) \wedge ((v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmf_sa_2)))))) \Rightarrow \\
& (k1_scmf_sa_m (k1_scmf_sa_m X0) = k1_scmf_sa_m X0)
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmf_sa_2)) \wedge \\
& ((v1_funct_1 X0) \wedge ((v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge \\
& (v1_partfun1 X0 (u1_struct_0 k1_scmf_sa_2)))))) \Rightarrow ((v1_relat_1 \\
& (k1_scmf_sa_m X0)) \wedge ((v4_relat_1 (k1_scmf_sa_m X0) (u1_struct_0 \\
& k1_scmf_sa_2)) \wedge ((v1_funct_1 (k1_scmf_sa_m X0)) \wedge ((v5_funct_1 \\
& (k1_scmf_sa_m X0) (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 \\
& (k1_scmf_sa_m X0) (u1_struct_0 k1_scmf_sa_2))))))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 (u1_struct_0 k1_scmf_sa_2)) \wedge \\
& ((v1_funct_1 X0) \wedge ((v5_funct_1 X0 (k2_memstr_0 np_3 k1_scmf_sa_2)))))) \Rightarrow \\
& ((v1_relat_1 (k1_scmf_sa_m X0)) \wedge ((v4_relat_1 (k1_scmf_sa_m X0) \\
& (u1_struct_0 k1_scmf_sa_2)) \wedge ((v1_funct_1 (k1_scmf_sa_m X0)) \wedge \\
& (v5_funct_1 (k1_scmf_sa_m X0) (k2_memstr_0 np_3 k1_scmf_sa_2))))))
\end{aligned} \tag{8}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_ami_2 X1) \wedge (m1_subset_1 \\
& X1 (u1_struct_0 k1_scmf_sa_2))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge \\
& ((v1_relat_1 X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 \\
& (u1_compos_1 k1_scmf_sa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 \\
& X2) \wedge (v1_afinsq_1 X2)))))))))) \Rightarrow (\forall X3.((v1_relat_1 X3) \wedge ((\\
& v4_relat_1 X3 (u1_struct_0 k1_scmf_sa_2)) \wedge ((v1_funct_1 X3) \wedge (\\
& (v5_funct_1 X3 (k2_memstr_0 np_3 k1_scmf_sa_2)) \wedge (v1_partfun1 \\
& X3 (u1_struct_0 k1_scmf_sa_2)))))) \Rightarrow (((r1_scm_halt X2 X3 X0) \wedge (\\
& (r2_scm_halt X2 X3 X0) \wedge (k5_memstr_0 np_3 k1_scmf_sa_2 (k5_extpro_1 \\
& np_3 k1_scmf_sa_2 (k1_funct_4 X0 (k2_scmf_sa_9 X1 X2)) (k1_scmf_sa_m \\
& X3) (k2_nat_1 np_1 (k8_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 \\
& X0 X2) (k1_scmf_sa_m X3)))))) = k2_nat_1 (k5_memstr_0 np_3 k1_scmf_sa_2 \\
& (k5_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 X0 X2) (k1_scmf_sa_m \\
& X3) (k8_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 X0 X2) (k1_scmf_sa_m \\
& X3)))) np_4))) \Rightarrow (k3_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 X0 \\
& (k2_scmf_sa_9 X1 X2)) (k5_extpro_1 np_3 k1_scmf_sa_2 (k1_funct_4 \\
& X0 (k2_scmf_sa_9 X1 X2)) (k1_scmf_sa_m X3) (k2_nat_1 np_1 (k8_extpro_1 \\
& np_3 k1_scmf_sa_2 (k1_funct_4 X0 X2) (k1_scmf_sa_m X3)))))) = k11_scmf_sa_2 \\
& (k2_nat_1 (k5_card_1 X2) np_4))))))
\end{aligned}$$