

t43_scm_halt
(TMQ9XNZuMFN1KAadATq4dvmjxdRD8BBtSLz)

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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 $k1_scmfsa_2 : \iota$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ 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 $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $v1_finset_1 : \iota \Rightarrow o$ be given. Let $v1_afinsq_1 : \iota \Rightarrow o$ be given. Let $v2_scm_halt : \iota \Rightarrow o$ be given. Let $v1_ami_2 : \iota \Rightarrow o$ be given. Let $v1_scmfsa_m : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_scmfsa8b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1_xxreal_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_numbers : \iota$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_scmfsa6b : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_funct_4 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_memstr_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_nat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_card_1 : \iota \Rightarrow \iota$ 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 $v1_scm_halt :$

$\iota \Rightarrow o$ be given. Let $k4_ordinal1 : \iota$ be given. Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmfsa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((\neg v1_xboole_0 X1) \wedge ((v1_relat_1 \\
& X1) \wedge ((v4_relat_1 X1 k5_numbers) \wedge ((v5_relat_1 X1 (u1_compos_1 \\
& k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v1_finset_1 X1) \wedge (v1_afinsq_1 \\
& X1))))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 X2) \wedge \\
& ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 X2))))))) \Rightarrow \\
& (\forall X3.((v1_ami_2 X3) \wedge ((\neg v1_scmfsa_m X3) \wedge (m1_subset_1 \\
& X3 (u1_struct_0 k1_scmfsa_2)))))) \Rightarrow (\forall X4.((v1_relat_1 X4) \wedge \\
& ((v4_relat_1 X4 (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 X4) \wedge \\
& ((v5_funct_1 X4 (k2_memstr_0 np_3 k1_scmfsa_2)) \wedge (v1_partfun1 \\
& X4 (u1_struct_0 k1_scmfsa_2)))))) \Rightarrow (((r1_xxreal_0 (k1_funct_1 \\
& X4 X3) k6_numbers) \wedge ((r1_scm_halt X2 X4 X0) \wedge (r2_scm_halt X2 X4 X0))) \Rightarrow \\
& (r8_pboole (u1_struct_0 k1_scmfsa_2) (k1_scmfsa6b (k2_scmfsa8b \\
& X3 X1 X2) X4 X0) (k1_funct_4 (k1_scmfsa6b X2 X4 X0) (k7_memstr_0 np_3 \\
& k1_scmfsa_2 (k2_nat_1 (k2_nat_1 (k5_card_1 X1) (k5_card_1 X2)) \\
& np_3))))))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmfsa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmfsa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmfsa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmfsa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2))))))) \Rightarrow (\forall X3.((\neg v1_xboole_0 X3) \wedge ((v1_relat_1 X3) \wedge \\
& ((v4_relat_1 X3 k5_numbers) \wedge ((v5_relat_1 X3 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& ((v1_funct_1 X3) \wedge ((v1_finset_1 X3) \wedge (v1_afinsq_1 X3))))))) \Rightarrow \\
& (\forall X4.((v1_ami_2 X4) \wedge ((\neg v1_scmfsa_m X4) \wedge (m1_subset_1 \\
& X4 (u1_struct_0 k1_scmfsa_2)))))) \Rightarrow (((r1_xxreal_0 (k1_funct_1 \\
& X1 X4) k6_numbers) \wedge ((r1_scm_halt X3 X1 X0) \wedge (r2_scm_halt X3 X1 X0))) \Rightarrow \\
& ((r1_scm_halt (k2_scmfsa8b X4 X2 X3) X1 X0) \wedge (r2_scm_halt (k2_scmfsa8b \\
& X4 X2 X3) X1 X0))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmfsa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmfsa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmfsa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmfsa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2)))))) \Rightarrow (\forall X3.((\neg v1_xboole_0 X3) \wedge ((v1_relat_1 X3) \wedge \\
& ((v4_relat_1 X3 k5_numbers) \wedge ((v5_relat_1 X3 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& ((v1_funct_1 X3) \wedge ((v1_finset_1 X3) \wedge (v1_afinsq_1 X3)))))) \Rightarrow \\
& (\forall X4.((v1_ami_2 X4) \wedge ((\neg v1_scmfsa_m X4) \wedge (m1_subset_1 \\
& X4 (u1_struct_0 k1_scmfsa_2)))) \Rightarrow (((r1_scm_halt X2 X1 X0) \wedge (r2_scm_halt \\
& X2 X1 X0)) \Rightarrow ((r1_xreal_0 (k1_funct_1 X1 X4) k6_numbers) \vee (r8_pboole \\
& (u1_struct_0 k1_scmfsa_2) (k1_scmfsa6b (k2_scmfsa8b X4 X2 X3) \\
& X1 X0) (k1_funct_4 (k1_scmfsa6b X2 X1 X0) (k7_memstr_0 np_3 k1_scmfsa_2 \\
& (k2_nat_1 (k2_nat_1 (k5_card_1 X2) (k5_card_1 X3)) np_3)))))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmfsa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmfsa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmfsa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmfsa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 \\
& X2)))))) \Rightarrow (\forall X3.((\neg v1_xboole_0 X3) \wedge ((v1_relat_1 X3) \wedge \\
& ((v4_relat_1 X3 k5_numbers) \wedge ((v5_relat_1 X3 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& ((v1_funct_1 X3) \wedge ((v1_finset_1 X3) \wedge (v1_afinsq_1 X3)))))) \Rightarrow \\
& (\forall X4.((v1_ami_2 X4) \wedge ((\neg v1_scmfsa_m X4) \wedge (m1_subset_1 \\
& X4 (u1_struct_0 k1_scmfsa_2)))) \Rightarrow (((r1_scm_halt X2 X1 X0) \wedge (r2_scm_halt \\
& X2 X1 X0)) \Rightarrow ((r1_xreal_0 (k1_funct_1 X1 X4) k6_numbers) \vee ((r1_scm_halt \\
& (k2_scmfsa8b X4 X2 X3) X1 X0) \wedge (r2_scm_halt (k2_scmfsa8b X4 X2 X3) \\
& X1 X0))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge ((v1_relat_1 X0) \wedge ((v4_relat_1 \\
& X0 k5_numbers) \wedge ((v5_relat_1 X0 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& (v1_funct_1 X0) \wedge ((v1_finset_1 X0) \wedge (v1_afinsq_1 X0)))))) \Rightarrow (\\
& (v2_scm_halt X0) \Leftrightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmfsa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmfsa_2)))))) \Rightarrow (\forall X2.((v1_relat_1 X2) \wedge ((v4_relat_1 \\
& X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& (v1_funct_1 X2) \wedge (v1_partfun1 X2 k5_numbers)))))) \Rightarrow (r2_scm_halt \\
& X0 X1 X2)))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge ((v1_relat_1 X0) \wedge ((v4_relat_1 \\
& X0 k5_numbers) \wedge ((v5_relat_1 X0 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& (v1_funct_1 X0) \wedge ((v1_finset_1 X0) \wedge (v1_afinsq_1 X0)))))) \Rightarrow (\\
& (v1_scm_halt X0) \Leftrightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmfsa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmfsa_2)))))) \Rightarrow (\forall X2.((v1_relat_1 X2) \wedge ((v4_relat_1 \\
& X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& (v1_funct_1 X2) \wedge (v1_partfun1 X2 k5_numbers)))))) \Rightarrow (r1_scm_halt \\
& X0 X1 X2)))
\end{aligned} \tag{6}$$

Assume the following.

$$k5_numbers = k4_ordinal1 \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((v1_ami_2 X0) \wedge (m1_subset_1 \\
& X0 (u1_struct_0 k1_scmfsa_2))) \wedge ((\neg v1_xboole_0 X1) \wedge ((v1_relat_1 \\
& X1) \wedge ((v4_relat_1 X1 k5_numbers) \wedge ((v5_relat_1 X1 (u1_compos_1 \\
& k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v1_finset_1 X1) \wedge (v1_afinsq_1 \\
& X1)))))) \wedge ((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 X2) \wedge ((v4_relat_1 \\
& X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& (v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge (v1_afinsq_1 X2))))))))) \Rightarrow \\
& ((\neg v1_xboole_0 (k2_scmfsa8b X0 X1 X2)) \wedge ((v1_relat_1 (k2_scmfsa8b \\
& X0 X1 X2)) \wedge ((v4_relat_1 (k2_scmfsa8b X0 X1 X2) k5_numbers) \wedge ((v5_relat_1 \\
& (k2_scmfsa8b X0 X1 X2) (u1_compos_1 k1_scmfsa_2)) \wedge ((v1_funct_1 \\
& (k2_scmfsa8b X0 X1 X2)) \wedge ((v1_finset_1 (k2_scmfsa8b X0 X1 X2)) \wedge \\
& (v1_afinsq_1 (k2_scmfsa8b X0 X1 X2)))))))))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v1_xboole_0 X0) \wedge ((v1_relat_1 X0) \wedge ((v4_relat_1 \\
& X0 k5_numbers) \wedge ((v5_relat_1 X0 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& (v1_funct_1 X0) \wedge ((v1_finset_1 X0) \wedge ((v1_afinsq_1 X0) \wedge (v2_scm_halt \\
& X0)))))) \Rightarrow ((\neg v1_xboole_0 X0) \wedge ((v1_relat_1 X0) \wedge ((v4_relat_1 \\
& X0 k5_numbers) \wedge ((v5_relat_1 X0 (u1_compos_1 k1_scmfsa_2)) \wedge \\
& (v1_funct_1 X0) \wedge ((v1_finset_1 X0) \wedge ((v1_afinsq_1 X0) \wedge (v1_scm_halt \\
& X0)))))))))
\end{aligned} \tag{9}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((v1_relat_1 X0) \wedge ((v4_relat_1 X0 k5_numbers) \wedge ((v5_relat_1 \\
& X0 (u1_compos_1 k1_scmfsa_2)) \wedge ((v1_funct_1 X0) \wedge (v1_partfun1 \\
& X0 k5_numbers)))) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge ((v4_relat_1 \\
& X1 (u1_struct_0 k1_scmfsa_2)) \wedge ((v1_funct_1 X1) \wedge ((v5_funct_1 \\
& X1 (k2_memstr_0 np_3 k1_scmfsa_2)) \wedge (v1_partfun1 X1 (u1_struct_0 \\
& k1_scmfsa_2)))))) \Rightarrow (\forall X2.((\neg v1_xboole_0 X2) \wedge ((v1_relat_1 \\
& X2) \wedge ((v4_relat_1 X2 k5_numbers) \wedge ((v5_relat_1 X2 (u1_compos_1 \\
& k1_scmfsa_2)) \wedge ((v1_funct_1 X2) \wedge ((v1_finset_1 X2) \wedge ((v1_afinsq_1 \\
& X2) \wedge (v2_scm_halt X2)))))) \Rightarrow (\forall X3.((\neg v1_xboole_0 X3) \wedge \\
& ((v1_relat_1 X3) \wedge ((v4_relat_1 X3 k5_numbers) \wedge ((v5_relat_1 X3 \\
& (u1_compos_1 k1_scmfsa_2)) \wedge ((v1_funct_1 X3) \wedge ((v1_finset_1 \\
& X3) \wedge ((v1_afinsq_1 X3) \wedge (v2_scm_halt X3)))))) \Rightarrow (\forall X4. \\
& ((v1_ami_2 X4) \wedge ((\neg v1_scmfsa_m X4) \wedge (m1_subset_1 X4 (u1_struct_0 \\
& k1_scmfsa_2)))) \Rightarrow ((v2_scm_halt (k2_scmfsa8b X4 X2 X3)) \wedge ((\neg r1_xxreal_0 \\
& (k1_funct_1 X1 X4) k6_numbers) \Rightarrow (r8_pboole (u1_struct_0 k1_scmfsa_2) \\
& (k1_scmfsa6b (k2_scmfsa8b X4 X2 X3) X1 X0) (k1_funct_4 (k1_scmfsa6b \\
& X2 X1 X0) (k7_memstr_0 np_3 k1_scmfsa_2 (k2_nat_1 (k2_nat_1 (k5_card_1 \\
& X2) (k5_card_1 X3)) np_3)))) \wedge ((r1_xxreal_0 (k1_funct_1 X1 X4) \\
& k6_numbers) \Rightarrow (r8_pboole (u1_struct_0 k1_scmfsa_2) (k1_scmfsa6b \\
& (k2_scmfsa8b X4 X2 X3) X1 X0) (k1_funct_4 (k1_scmfsa6b X3 X1 X0) (\\
& k7_memstr_0 np_3 k1_scmfsa_2 (k2_nat_1 (k2_nat_1 (k5_card_1 \\
& X2) (k5_card_1 X3)) np_3)))))))))
\end{aligned}$$