

t57_circrm1

(TMR5NdnPhDJpVsStRh7YP8YpiFTtchFp6KE)

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Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $v2_msafree2 : \iota \Rightarrow o$ be given. Let $l1_msualg_1 : \iota \Rightarrow o$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v4_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4_msafree2 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r5_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k4_card_3 : \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_relat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $r1_facirc_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_funct_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r3_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r4_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_funct_1 : \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_msafree2 \\
 & \quad X0) \wedge (l1_msualg_1 X0)))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg \\
 & \quad v11_struct_0 X1) \wedge ((v2_msafree2 X1) \wedge (l1_msualg_1 X1)))) \Rightarrow (\forall X2. \\
 & \quad ((v1_relat_1 X2) \wedge (v1_funct_1 X2)) \Rightarrow (\forall X3.((v1_relat_1 \\
 & \quad X3) \wedge (v1_funct_1 X3)) \Rightarrow (\forall X4.((v4_msualg_1 X4 X0) \wedge ((v4_msafree2 \\
 & \quad X4 X0) \wedge (l3_msualg_1 X4 X0))) \Rightarrow (\forall X5.((v4_msualg_1 X5 X1) \wedge \\
 & \quad ((v4_msafree2 X5 X1) \wedge (l3_msualg_1 X5 X1))) \Rightarrow ((r5_circrm1 X0 X1 \\
 & \quad X2 X3 X4 X5) \Rightarrow (r3_circrm1 X0 X1 X2))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_msafree2 \\
& \quad X0) \wedge (l1_msualg_1 X0)))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg \\
& \quad v11_struct_0 X1) \wedge ((v2_msafree2 X1) \wedge (l1_msualg_1 X1)))) \Rightarrow (\forall X2. \\
& \quad ((v1_relat_1 X2) \wedge (v1_funct_1 X2)) \Rightarrow (\forall X3.((v1_relat_1 \\
& \quad X3) \wedge (v1_funct_1 X3)) \Rightarrow (\forall X4.((v4_msualg_1 X4 X0) \wedge ((v4_msafree2 \\
& \quad X4 X0) \wedge (l3_msualg_1 X4 X0)))) \Rightarrow (\forall X5.((v4_msualg_1 X5 X1) \wedge \\
& \quad ((v4_msafree2 X5 X1) \wedge (l3_msualg_1 X5 X1)))) \Rightarrow (((r4_circuitrm1 X0 \\
& \quad X1 X2 X3 X4 X5) \wedge (r3_circuitrm1 X0 X1 X2)) \Rightarrow (\forall X6.(m1_subset_1 \\
& \quad X6 (k4_card_3 (u3_msualg_1 X1 X5))) \Rightarrow (\forall X7.(m1_subset_1 \\
& \quad X7 (k4_card_3 (u3_msualg_1 X0 X4))) \Rightarrow ((X7 = k3_relat_1 X2 X6) \Rightarrow (\forall X8. \\
& \quad (m1_subset_1 X8 (u1_struct_0 X0)) \Rightarrow ((r1_facirc_1 X0 X4 X7 X8) \Leftrightarrow (\\
& \quad \quad r1_facirc_1 X1 X5 X6 (k1_funct_1 X2 X8))))))))))))) \tag{2}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \Rightarrow (\forall X1. \\
& \quad ((\neg v2_struct_0 X1) \wedge (l1_msualg_1 X1)) \Rightarrow (\forall X2.((v1_relat_1 \\
& \quad X2) \wedge (v1_funct_1 X2)) \Rightarrow (\forall X3.((v1_relat_1 X3) \wedge (v1_funct_1 \\
& \quad X3)) \Rightarrow (\forall X4.((v4_msualg_1 X4 X0) \wedge (l3_msualg_1 X4 X0)) \Rightarrow (\\
& \quad \forall X5.((v4_msualg_1 X5 X1) \wedge (l3_msualg_1 X5 X1)) \Rightarrow ((r5_circuitrm1 \\
& \quad X0 X1 X2 X3 X4 X5) \Leftrightarrow ((r4_circuitrm1 X0 X1 X2 X3 X4 X5) \wedge (r4_circuitrm1 X1 \\
& \quad X0 (k2_funct_1 X2) (k2_funct_1 X3) X5 X4)))))) \tag{3}
\end{aligned}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_msafree2 \\
& \quad X0) \wedge (l1_msualg_1 X0)))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg \\
& \quad v11_struct_0 X1) \wedge ((v2_msafree2 X1) \wedge (l1_msualg_1 X1)))) \Rightarrow (\forall X2. \\
& \quad ((v1_relat_1 X2) \wedge (v1_funct_1 X2)) \Rightarrow (\forall X3.((v1_relat_1 \\
& \quad X3) \wedge (v1_funct_1 X3)) \Rightarrow (\forall X4.((v4_msualg_1 X4 X1) \wedge ((v4_msafree2 \\
& \quad X4 X1) \wedge (l3_msualg_1 X4 X1)))) \Rightarrow (\forall X5.((v4_msualg_1 X5 X0) \wedge \\
& \quad ((v4_msafree2 X5 X0) \wedge (l3_msualg_1 X5 X0))) \Rightarrow ((r5_circuitrm1 X1 X0 \\
& \quad X2 X3 X4 X5) \Rightarrow (\forall X6.(m1_subset_1 X6 (k4_card_3 (u3_msualg_1 \\
& \quad X1 X4))) \Rightarrow (\forall X7.(m1_subset_1 X7 (k4_card_3 (u3_msualg_1 \\
& \quad X0 X5))) \Rightarrow ((X6 = k3_relat_1 X2 X7) \Rightarrow (\forall X8.(m1_subset_1 X8 (\\
& \quad u1_struct_0 X1)) \Rightarrow ((r1_facirc_1 X1 X4 X6 X8) \Leftrightarrow (r1_facirc_1 X0 X5 \\
& \quad X7 (k1_funct_1 X2 X8)))))))))))))
\end{aligned}$$