

# t24\_circrm1 (TMcHFkdHDzCkChXXJkBdze- BRMCgZ63rhSw)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  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  $r1\_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k10\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v2\_funct\_1 : \iota \Rightarrow o$  be given. Let  $k9\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k2\_funct\_1 : \iota \Rightarrow \iota$  be given. Let  $r3\_pua2mss1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_msualg\_1 : \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} \forall X0.((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow ((v2\_funct\_1 X0) \Rightarrow \\ ((k10\_xtuple\_0 X0 = k9\_xtuple\_0 (k2\_funct\_1 X0)) \wedge (k9\_xtuple\_0 \\ X0 = k10\_xtuple\_0 (k2\_funct\_1 X0)))) \end{aligned} \quad (1)$$

Assume the following.

$$\forall X0.((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow ((v1\_relat\_1 (k2\_funct\_1 X0)) \wedge (v1\_funct\_1 (k2\_funct\_1 X0))) \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. \\ ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1)) \Rightarrow (\forall X2.((v1\_relat\_1 \\ X2) \wedge (v1\_funct\_1 X2)) \Rightarrow (\forall X3.((v1\_relat\_1 X3) \wedge (v1\_funct\_1 \\ X3)) \Rightarrow ((r1\_circrm1 X0 X1 X2 X3) \Leftrightarrow ((v2\_funct\_1 X2) \wedge ((v2\_funct\_1 \\ X3) \wedge (r3\_pua2mss1 X0 X1 X2 X3) \wedge (r3\_pua2mss1 X1 X0 (k2\_funct\_1 X2) \\ (k2\_funct\_1 X3)))))))))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1\_msualg\_1 X0) \Rightarrow (\forall X1.(l1\_msualg\_1 X1) \Rightarrow (\forall X2. \\
& ((v1\_relat\_1 X2) \wedge (v1\_funct\_1 X2)) \Rightarrow (\forall X3. ((v1\_relat\_1 \\
& X3) \wedge (v1\_funct\_1 X3)) \Rightarrow ((r3\_pua2mss1 X0 X1 X2 X3) \Leftrightarrow ((k9\_xtuple\_0 \\
& X2 = u1\_struct\_0 X0) \wedge ((k9\_xtuple\_0 X3 = u4\_struct\_0 X0) \wedge ((r1\_tarski \\
& (k10\_xtuple\_0 X2) (u1\_struct\_0 X1)) \wedge ((r1\_tarski (k10\_xtuple\_0 \\
& X3) (u4\_struct\_0 X1)) \wedge ((k3\_relat\_1 (u2\_msualg\_1 X0) X2 = k3\_relat\_1 \\
& X3 (u2\_msualg\_1 X1)) \wedge (\forall X4. \forall X5. ((v1\_relat\_1 X5) \wedge \\
& (v1\_funct\_1 X5)) \Rightarrow (((X4 \in u4\_struct\_0 X0) \wedge (X5 = k1\_funct\_1 (u1\_msualg\_1 \\
& X0) X4)) \Rightarrow (k3\_relat\_1 X5 X2 = k1\_funct\_1 (u1\_msualg\_1 X1) (k1\_funct\_1 \\
& X3 X4))))))))))))) \\
& \tag{4}
\end{aligned}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1)) \Rightarrow (\forall X2. ((v1\_relat\_1 \\
& X2) \wedge (v1\_funct\_1 X2)) \Rightarrow (\forall X3. ((v1\_relat\_1 X3) \wedge (v1\_funct\_1 \\
& X3)) \Rightarrow ((r1\_circtrm1 X0 X1 X2 X3) \Rightarrow ((k10\_xtuple\_0 X2 = u1\_struct\_0 \\
& X1) \wedge (k10\_xtuple\_0 X3 = u4\_struct\_0 X1))))))
\end{aligned}$$