

## t14\_circrm1

(TMUup44byxLDRyhDACpjZXYmJTrqPQDfHFk)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v2\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k1\_msaterm : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $k6\_finseq\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $g3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_circrm1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $u4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 \\ & X0)) \wedge (((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 (u1\_struct\_0 X0)) \wedge (( \\ & v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 (u1\_struct\_0 X0)))))) \wedge (m2\_pboole \\ & X2 (u4\_struct\_0 X0) (k3\_relat\_1 (u1\_msualg\_1 X0) (k6\_finseq\_2 \\ & (u1\_struct\_0 X0) X1)) (k3\_relat\_1 (u2\_msualg\_1 X0) X1)))) \Rightarrow (\forall X3. \\ & \forall X4. \forall X5. (g3\_msualg\_1 X0 X1 X2 = g3\_msualg\_1 X3 X4 X5) \Rightarrow \\ & ((X0 = X3) \wedge ((X1 = X4) \wedge (X2 = X5)))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0)\wedge((\neg v11\_struct\_0 X0)\wedge(l1\_msualg\_1 X0)))\wedge(((v1\_relat\_1 X1)\wedge \\
& ((v2\_relat\_1 X1)\wedge((v4\_relat\_1 X1 (u1\_struct\_0 X0))\wedge((v1\_funct\_1 \\
& X1)\wedge(v1\_partfun1 X1 (u1\_struct\_0 X0))))))\wedge(((\neg v1\_xboole\_0 X2)\wedge \\
& (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k1\_msaterm X0 X1))))\wedge((v4\_msualg\_1 \\
& X3 X0)\wedge(l3\_msualg\_1 X3 X0))))\Rightarrow((v3\_msualg\_1 (k6\_circtrm1 X0 \\
& X1 X2 X3) (k1\_circtrm1 X0 X1 X2))\wedge((v4\_msualg\_1 (k6\_circtrm1 X0 \\
& X1 X2 X3) (k1\_circtrm1 X0 X1 X2))\wedge(l3\_msualg\_1 (k6\_circtrm1 X0 X1 \\
& X2 X3) (k1\_circtrm1 X0 X1 X2))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0)\wedge((\neg v11\_struct\_0 X0)\wedge(l1\_msualg\_1 X0)))\wedge(((v1\_relat\_1 X1)\wedge \\
& ((v2\_relat\_1 X1)\wedge((v4\_relat\_1 X1 (u1\_struct\_0 X0))\wedge((v1\_funct\_1 \\
& X1)\wedge(v1\_partfun1 X1 (u1\_struct\_0 X0))))))\wedge(((\neg v1\_xboole\_0 X2)\wedge \\
& (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k1\_msaterm X0 X1))))\wedge((v4\_msualg\_1 \\
& X3 X0)\wedge(l3\_msualg\_1 X3 X0))))\Rightarrow(m2\_pboole (k5\_circtrm1 X0 X1 X2 \\
& X3) (u4\_struct\_0 (k1\_circtrm1 X0 X1 X2)) (k3\_relat\_1 (u1\_msualg\_1 \\
& (k1\_circtrm1 X0 X1 X2)) (k6\_finseq\_2 (u1\_struct\_0 (k1\_circtrm1 \\
& X0 X1 X2)) (k4\_circtrm1 X0 X1 X2 X3))) (k3\_relat\_1 (u2\_msualg\_1 ( \\
& k1\_circtrm1 X0 X1 X2)) (k4\_circtrm1 X0 X1 X2 X3)))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0)\wedge((\neg v11\_struct\_0 X0)\wedge(l1\_msualg\_1 X0)))\wedge(((v1\_relat\_1 X1)\wedge \\
& ((v2\_relat\_1 X1)\wedge((v4\_relat\_1 X1 (u1\_struct\_0 X0))\wedge((v1\_funct\_1 \\
& X1)\wedge(v1\_partfun1 X1 (u1\_struct\_0 X0))))))\wedge(((\neg v1\_xboole\_0 X2)\wedge \\
& (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k1\_msaterm X0 X1))))\wedge(l3\_msualg\_1 \\
& X3 X0))))\Rightarrow((v1\_relat\_1 (k4\_circtrm1 X0 X1 X2 X3))\wedge((v4\_relat\_1 \\
& (k4\_circtrm1 X0 X1 X2 X3) (u1\_struct\_0 (k1\_circtrm1 X0 X1 X2)))\wedge \\
& ((v1\_funct\_1 (k4\_circtrm1 X0 X1 X2 X3))\wedge(v1\_partfun1 (k4\_circtrm1 \\
& X0 X1 X2 X3) (u1\_struct\_0 (k1\_circtrm1 X0 X1 X2))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 \\
& X0)\wedge(l1\_msualg\_1 X0)))\wedge(((v1\_relat\_1 X1)\wedge((v2\_relat\_1 X1)\wedge \\
& ((v4\_relat\_1 X1 (u1\_struct\_0 X0))\wedge((v1\_funct\_1 X1)\wedge(v1\_partfun1 \\
& X1 (u1\_struct\_0 X0))))))\wedge(((\neg v1\_xboole\_0 X2)\wedge(m1\_subset\_1 X2 \\
& (k1\_zfmisc\_1 (k1\_msaterm X0 X1))))))\Rightarrow((\neg v2\_struct\_0 (k1\_circtrm1 \\
& X0 X1 X2))\wedge((v1\_msualg\_1 (k1\_circtrm1 X0 X1 X2))\wedge(l1\_msualg\_1 \\
& (k1\_circtrm1 X0 X1 X2))))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 \\
& X0))) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v2\_relat\_1 X1) \wedge ((v4\_relat\_1 \\
& X1 (u1\_struct\_0 X0)) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 (u1\_struct\_0 \\
& X0)))))) \Rightarrow (\forall X2.((\neg v1\_xboole\_0 X2) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\
& (k1\_msaterm X0 X1)))) \Rightarrow (\forall X3.((v4\_msualg\_1 X3 X0) \wedge (l3\_msualg\_1 \\
& X3 X0)) \Rightarrow (k6\_circtrm1 X0 X1 X2 X3 = g3\_msualg\_1 (k1\_circtrm1 X0 X1 \\
& X2) (k4\_circtrm1 X0 X1 X2 X3) (k5\_circtrm1 X0 X1 X2 X3))))))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 \\
& X0))) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v2\_relat\_1 X1) \wedge ((v4\_relat\_1 \\
& X1 (u1\_struct\_0 X0)) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 (u1\_struct\_0 \\
& X0)))))) \Rightarrow (\forall X2.((\neg v1\_xboole\_0 X2) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\
& (k1\_msaterm X0 X1)))) \Rightarrow (\forall X3.(l3\_msualg\_1 X3 X0) \Rightarrow (\forall X4. \\
& ((v1\_relat\_1 X4) \wedge ((v4\_relat\_1 X4 (u1\_struct\_0 (k1\_circtrm1 X0 \\
& X1 X2))) \wedge ((v1\_funct\_1 X4) \wedge (v1\_partfun1 X4 (u1\_struct\_0 (k1\_circtrm1 \\
& X0 X1 X2)))))) \Rightarrow ((X4 = k4\_circtrm1 X0 X1 X2 X3) \Leftrightarrow (\forall X5.(m1\_subset\_1 \\
& X5 (u1\_struct\_0 (k1\_circtrm1 X0 X1 X2))) \Rightarrow (k1\_funct\_1 X4 X5 = k2\_circtrm1 \\
& X0 X1 X2 X5 X3))))))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \wedge \\
& (l3\_msualg\_1 X1 X0)) \Rightarrow ((v3\_msualg\_1 X1 X0) \Rightarrow (X1 = g3\_msualg\_1 X0 \\
& (u3\_msualg\_1 X0 X1) (u4\_msualg\_1 X0 X1)))
\end{aligned} \tag{8}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 \\
& X0))) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v2\_relat\_1 X1) \wedge ((v4\_relat\_1 \\
& X1 (u1\_struct\_0 X0)) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 (u1\_struct\_0 \\
& X0)))))) \Rightarrow (\forall X2.((v4\_msualg\_1 X2 X0) \wedge (l3\_msualg\_1 X2 X0)) \Rightarrow \\
& (\forall X3.((\neg v1\_xboole\_0 X3) \wedge (m1\_subset\_1 X3 (k1\_zfmisc\_1 \\
& (k1\_msaterm X0 X1)))) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 \\
& (k1\_circtrm1 X0 X1 X3))) \Rightarrow (k1\_funct\_1 (u3\_msualg\_1 (k1\_circtrm1 \\
& X0 X1 X3) (k6\_circtrm1 X0 X1 X3 X2)) X4 = k2\_circtrm1 X0 X1 X3 X4 X2))))))
\end{aligned}$$