

t18\_circcomb  
(TMdmUhnCK2N4PY6UZfjFmo63Dmyjcxds7Si)

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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  $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r2\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $r1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_circcomb : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k3\_finseq\_2 : \iota \Rightarrow \iota$  be given. Let  $k13\_finseq\_1 : \iota \Rightarrow \iota$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $u1\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $k6\_finseq\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $l2\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l5\_struct\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\forall X0. \forall X1. (((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \wedge ((v1\_relat\_1 X1) \wedge (v1\_funct\_1 X1))) \Rightarrow (r1\_partfun1 X0 X0) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. ((l1\_msualg\_1 X0) \wedge (l1\_msualg\_1 X1)) \Rightarrow (r1\_circcomb X0 X0) \quad (2)$$

Assume the following.

$$\forall X0. k3\_finseq\_2 X0 = k13\_finseq\_1 X0 \quad (3)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1\_xboole\_0 X1)\wedge \\ & (((v1\_funct\_1 X2)\wedge((v1\_funct\_2 X2 X0 X1)\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X1))))))\wedge((v1\_relat\_1 X3)\wedge((v4\_relat\_1 X3 X1)\wedge \\ & ((v1\_funct\_1 X3)\wedge(v1\_partfun1 X3 X1))))))\Rightarrow((v1\_relat\_1 (k3\_relat\_1 \\ & X2 X3))\wedge((v4\_relat\_1 (k3\_relat\_1 X2 X3) X0)\wedge((v1\_funct\_1 (k3\_relat\_1 \\ & X2 X3))\wedge(v1\_partfun1 (k3\_relat\_1 X2 X3) X0)))) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0.\neg v1\_xboole\_0 (k13\_finseq\_1 X0) \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge(l1\_msualg\_1 X0))\wedge \\ & (l3\_msualg\_1 X1 X0))\Rightarrow(m2\_pboole (u4\_msualg\_1 X0 X1) (u4\_struct\_0 \\ & X0) (k3\_relat\_1 (u1\_msualg\_1 X0) (k6\_finseq\_2 (u1\_struct\_0 X0) \\ & (u3\_msualg\_1 X0 X1))) (k3\_relat\_1 (u2\_msualg\_1 X0) (u3\_msualg\_1 \\ & X0 X1))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((l1\_struct\_0 X0)\wedge(l2\_msualg\_1 X1 X0))\Rightarrow \\ & ((v1\_relat\_1 (u3\_msualg\_1 X0 X1))\wedge((v4\_relat\_1 (u3\_msualg\_1 \\ & X0 X1) (u1\_struct\_0 X0))\wedge((v1\_funct\_1 (u3\_msualg\_1 X0 X1))\wedge(v1\_partfun1 \\ & (u3\_msualg\_1 X0 X1) (u1\_struct\_0 X0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_msualg\_1 X0)\Rightarrow((v1\_funct\_1 (u2\_msualg\_1 X0))\wedge \\ & ((v1\_funct\_2 (u2\_msualg\_1 X0) (u4\_struct\_0 X0) (u1\_struct\_0 X0))\wedge \\ & (m1\_subset\_1 (u2\_msualg\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\ & X0) (u1\_struct\_0 X0)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_msualg\_1 X0)\Rightarrow((v1\_funct\_1 (u1\_msualg\_1 X0))\wedge \\ & ((v1\_funct\_2 (u1\_msualg\_1 X0) (u4\_struct\_0 X0) (k3\_finseq\_2 ( \\ & u1\_struct\_0 X0)))\wedge(m1\_subset\_1 (u1\_msualg\_1 X0) (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (u4\_struct\_0 X0) (k3\_finseq\_2 (u1\_struct\_0 X0)))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1\_relat\_1 X1)\wedge((v4\_relat\_1 \\ & X1 X0)\wedge((v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\wedge((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))))\Rightarrow \\ & (\forall X3.(m2\_pboole X3 X0 X1 X2)\Rightarrow((v1\_relat\_1 X3)\wedge((v4\_relat\_1 \\ & X3 X0)\wedge((v1\_funct\_1 X3)\wedge(v1\_partfun1 X3 X0)))) \end{aligned} \quad (11)$$

Assume the following.

$$\forall X0.(l5\_struct\_0 X0) \Rightarrow (l1\_struct\_0 X0) \quad (12)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. (l3\_msualg\_1 X1 X0) \Rightarrow (l2\_msualg\_1 X1 X0)) \quad (13)$$

Assume the following.

$$\forall X0.(l1\_msualg\_1 X0) \Rightarrow (l5\_struct\_0 X0) \quad (14)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge (v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0))) \Rightarrow ((v1\_relat\_1 (k6\_finseq\_2 X0 X1)) \wedge ((v4\_relat\_1 (k6\_finseq\_2 X0 X1) (k3\_finseq\_2 X0)) \wedge ((v1\_funct\_1 (k6\_finseq\_2 X0 X1)) \wedge (v1\_partfun1 (k6\_finseq\_2 X0 X1) (k3\_finseq\_2 X0)))))) \end{aligned} \quad (15)$$

Assume the following.

$$\forall X0. \forall X1. v1\_relat\_1 (k3\_relat\_1 X0 X1) \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1)) \Rightarrow (\forall X2. (l3\_msualg\_1 X2 X0) \Rightarrow (\forall X3. (l3\_msualg\_1 X3 X1) \Rightarrow ((r2\_circcomb X0 X1 X2 X3) \Leftrightarrow ((r1\_circcomb X0 X1) \wedge ((r1\_partfun1 (u3\_msualg\_1 X0 X2) (u3\_msualg\_1 X1 X3)) \wedge (r1\_partfun1 (u4\_msualg\_1 X0 X2) (u4\_msualg\_1 X1 X3)))))))))) \end{aligned} \quad (17)$$

**Theorem 1**

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 X0))) \Rightarrow (\forall X1. (l3\_msualg\_1 X1 X0) \Rightarrow (r2\_circcomb X0 X0 X1 X1))$$