

# t5\_circcomb

(TMXHS9sRSZAaceKieobrVEgapAhp7oT8vHs)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $r1\_circcomb : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota$  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  $k1\_funct\_4 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  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  $u1\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $k3\_finseq\_2 : \iota \Rightarrow \iota$  be given. Let  $v1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $k2\_xboole\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0.((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge (v1\_funct\_1 X1)) \Rightarrow ((r1\_partfun1 X0 X1) \Leftrightarrow (k1\_funct\_4 X0 X1 = k1\_funct\_4 X1 X0))) \quad (1)$$

Assume the following.

$$\forall X0.(l1\_msualg\_1 X0) \Rightarrow ((v1\_funct\_1 (u2\_msualg\_1 X0)) \wedge ((v1\_funct\_2 (u2\_msualg\_1 X0) (u4\_struct\_0 X0) (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 (u2\_msualg\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 X0) (u1\_struct\_0 X0)))))) \quad (2)$$

Assume the following.

$$\forall X0.(l1\_msualg\_1 X0) \Rightarrow ((v1\_funct\_1 (u1\_msualg\_1 X0)) \wedge ((v1\_funct\_2 (u1\_msualg\_1 X0) (u4\_struct\_0 X0) (k3\_finseq\_2 (u1\_struct\_0 X0))) \wedge (m1\_subset\_1 (u1\_msualg\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 X0) (k3\_finseq\_2 (u1\_struct\_0 X0)))))) \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \wedge ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1))) \Rightarrow (((\neg v2\_struct\_0 (k2\_circcomb X0 X1)) \wedge (v1\_msualg\_1 (k2\_circcomb X0 X1)) \wedge (l1\_msualg\_1 (k2\_circcomb X0 X1)))) \quad (4)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1)) \Rightarrow (\forall X2.((\neg v2\_struct\_0 \\
& X2) \wedge ((v1\_msualg\_1 X2) \wedge (l1\_msualg\_1 X2)))) \Rightarrow ((X2 = k2\_circcomb \\
& X0 X1) \Leftrightarrow ((u1\_struct\_0 X2 = k2\_xboole\_0 (u1\_struct\_0 X0) (u1\_struct\_0 \\
& X1)) \wedge ((u4\_struct\_0 X2 = k2\_xboole\_0 (u4\_struct\_0 X0) (u4\_struct\_0 \\
& X1)) \wedge ((u1\_msualg\_1 X2 = k1\_funct\_4 (u1\_msualg\_1 X0) (u1\_msualg\_1 \\
& X1)) \wedge (u2\_msualg\_1 X2 = k1\_funct\_4 (u2\_msualg\_1 X0) (u2\_msualg\_1 \\
& X1)))))))))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1\_msualg\_1 X0) \Rightarrow (\forall X1.(l1\_msualg\_1 X1) \Rightarrow (( \\
& r1\_circcomb X0 X1) \Leftrightarrow ((r1\_partfun1 (u1\_msualg\_1 X0) (u1\_msualg\_1 \\
& X1)) \wedge (r1\_partfun1 (u2\_msualg\_1 X0) (u2\_msualg\_1 X1))))))
\end{aligned} \tag{6}$$

Assume the following.

$$\forall X0. \forall X1. k2\_xboole\_0 X0 X1 = k2\_xboole\_0 X1 X0 \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\
& (k2\_zfmisc\_1 X0 X1))) \Rightarrow (v1\_relat\_1 X2)
\end{aligned} \tag{8}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1)) \Rightarrow ((r1\_circcomb X0 X1) \Rightarrow ( \\
& k2\_circcomb X0 X1 = k2\_circcomb X1 X0)))
\end{aligned}$$