

# t17\_circcomb (TMXFxYqN- SHZ1sCxaBQGGuot9GakjL8JLKfWP)

October 27, 2020

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  $r1\_circcomb : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_msafree2 : \iota \Rightarrow \iota$  be given. Let  $k4\_msafree2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. \\ & ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1)) \Rightarrow ((r1\_circcomb X0 X1) \Rightarrow ( \\ & k2\_circcomb X0 X1 = k2\_circcomb X1 X0))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. \\ & ((\neg v2\_struct\_0 X1) \wedge ((\neg v11\_struct\_0 X1) \wedge ((v2\_msafree2 X1) \wedge ( \\ & l1\_msualg\_1 X1)))) \Rightarrow (\forall X2.((\neg v2\_struct\_0 X2) \wedge ((\neg v11\_struct\_0 \\ & X2) \wedge ((v2\_msafree2 X2) \wedge (l1\_msualg\_1 X2)))) \Rightarrow ((X2 = k2\_circcomb \\ & X0 X1) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X1)) \Rightarrow ((X3 \in k3\_msafree2 \\ & X1) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 X2)) \Rightarrow ((X3 = X4) \Rightarrow \\ & ((X4 \in k3\_msafree2 X2) \wedge (k4\_msafree2 X2 X4 = k4\_msafree2 X1 X3)))))))))) \end{aligned} \quad (2)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_msafree2 \\ & X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((\neg \\ & v11\_struct\_0 X1) \wedge ((v2\_msafree2 X1) \wedge (l1\_msualg\_1 X1)))) \Rightarrow (\forall X2. \\ & ((\neg v2\_struct\_0 X2) \wedge (l1\_msualg\_1 X2)) \Rightarrow (((r1\_circcomb X0 X2) \wedge \\ & (X1 = k2\_circcomb X0 X2)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 \\ & X0)) \Rightarrow ((X3 \in k3\_msafree2 X0) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 \\ & X1)) \Rightarrow ((X3 = X4) \Rightarrow ((X4 \in k3\_msafree2 X1) \wedge (k4\_msafree2 X1 X4 = k4\_msafree2 \\ & X0 X3)))))))))) \end{aligned}$$