

## t17\_facirc\_2

(TMZg6XCZ1mo1W6j7jVhCvreCwtmdGPwKvsx)

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Let  $k3\_msafree2 : \iota \Rightarrow \iota$  be given. Let  $k14\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_enumset1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k10\_finseq\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_facirc\_1 : \iota$  be given. Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_circcomb : \iota \Rightarrow o$  be given. Let  $v2\_circcomb : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $r1\_circcomb : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_finseq\_1 : \iota \Rightarrow o$  be given. Let  $k2\_msafree2 : \iota \Rightarrow \iota$  be given. Let  $k5\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k10\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k2\_xboole\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_msualg\_1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v1\_circcomb X0) \wedge ((v2\_circcomb \\ & X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v1\_circcomb \\ & X1) \wedge ((v2\_circcomb X1) \wedge (l1\_msualg\_1 X1)))) \Rightarrow (r1\_circcomb X0 X1)) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ & X1))) \Rightarrow ((k2\_msafree2 (k5\_circcomb X0 X1) = k10\_xtuple\_0 X1) \wedge (k3\_msafree2 \\ & (k5\_circcomb X0 X1) = k1\_tarski (k4\_tarski X1 X0))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. k1\_enumset1 X0 X1 X2 = k2\_xboole\_0 \\ & (k2\_tarski X0 X1) (k1\_tarski X2) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. k2\_tarski X0 X1 = k2\_xboole\_0 (k1\_tarski \\ & X0) (k1\_tarski X1) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (\forall X1. \\ & ((\neg v2\_struct\_0 X1) \wedge (l1\_msualg\_1 X1)) \Rightarrow ((r1\_circcomb X0 X1) \Rightarrow ( \\ & (k3\_msafree2 (k2\_circcomb X0 X1) = k2\_xboole\_0 (k3\_msafree2 X0) \\ & (k3\_msafree2 X1)) \wedge (r1\_tarski (k2\_msafree2 (k2\_circcomb X0 X1)) \\ & (k2\_xboole\_0 (k2\_msafree2 X0) (k2\_msafree2 X1)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ & X1))) \Rightarrow ((\neg v2\_struct\_0 (k5\_circcomb X0 X1)) \wedge ((\neg v11\_struct\_0 ( \\ & k5\_circcomb X0 X1)) \wedge (v1\_msualg\_1 (k5\_circcomb X0 X1)))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (v1\_relat\_1 (k10\_finseq\_1 X0 X1)) \wedge (v1\_funct\_1 \\ & (k10\_finseq\_1 X0 X1)) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_circcomb X0) \wedge \\ & (l1\_msualg\_1 X0))) \wedge ((\neg v2\_struct\_0 X1) \wedge ((v2\_circcomb X1) \wedge (l1\_msualg\_1 \\ & X1)))) \Rightarrow ((\neg v2\_struct\_0 (k2\_circcomb X0 X1)) \wedge ((v1\_msualg\_1 (k2\_circcomb \\ & X0 X1)) \wedge (v2\_circcomb (k2\_circcomb X0 X1)))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v1\_circcomb X0) \wedge \\ & (l1\_msualg\_1 X0))) \wedge ((\neg v2\_struct\_0 X1) \wedge ((v1\_circcomb X1) \wedge (l1\_msualg\_1 \\ & X1)))) \Rightarrow ((\neg v2\_struct\_0 (k2\_circcomb X0 X1)) \wedge ((v1\_msualg\_1 (k2\_circcomb \\ & X0 X1)) \wedge (v1\_circcomb (k2\_circcomb X0 X1)))) \end{aligned} \quad (9)$$

Assume the following.

$$\forall X0. \forall X1. v1\_finseq\_1 (k10\_finseq\_1 X0 X1) \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ & X1))) \Rightarrow ((\neg v11\_struct\_0 (k5\_circcomb X0 X1)) \wedge ((v1\_msualg\_1 (k5\_circcomb \\ & X0 X1)) \wedge ((v1\_circcomb (k5\_circcomb X0 X1)) \wedge (v2\_circcomb (k5\_circcomb \\ & X0 X1)))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ & X1))) \Rightarrow ((\neg v11\_struct\_0 (k5\_circcomb X0 X1)) \wedge ((v1\_msualg\_1 (k5\_circcomb \\ & X0 X1)) \wedge (l1\_msualg\_1 (k5\_circcomb X0 X1)))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge(l1\_msualg\_1 X0))\wedge \\ & ((\neg v2\_struct\_0 X1)\wedge(l1\_msualg\_1 X1)))\Rightarrow((\neg v2\_struct\_0 (k2\_circcomb \\ & X0 X1))\wedge((v1\_msualg\_1 (k2\_circcomb X0 X1))\wedge(l1\_msualg\_1 (k2\_circcomb \\ & X0 X1)))) \end{aligned} \tag{13}$$

Assume the following.

$$\forall X0.\forall X1.k4\_tarski X0 X1 = k2\_tarski (k2\_tarski X0 X1) (k1\_tarski X0) \tag{14}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.k14\_facirc\_1 X0 X1 X2 = k2\_circcomb \\ & (k2\_circcomb (k5\_circcomb k3\_facirc\_1 (k10\_finseq\_1 X0 X1)) ( \\ & k5\_circcomb k3\_facirc\_1 (k10\_finseq\_1 X1 X2))) (k5\_circcomb k3\_facirc\_1 \\ & (k10\_finseq\_1 X2 X0)) \end{aligned} \tag{15}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.k3\_msafree2 (k14\_facirc\_1 X0 \\ & X1 X2) = k1\_enumset1 (k4\_tarski (k10\_finseq\_1 X0 X1) k3\_facirc\_1) \\ & (k4\_tarski (k10\_finseq\_1 X1 X2) k3\_facirc\_1) (k4\_tarski (k10\_finseq\_1 \\ & X2 X0) k3\_facirc\_1) \end{aligned}$$