

t106\_gfacirc1 (TMC-  
nhmGa4wxhUgCQtGEM49TuT4SrNBBspoW)

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Let  $k3\_msafree2 : \iota \Rightarrow \iota$  be given. Let  $k43\_gfacirc1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_xboole\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  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  $k4\_twoscomp : \iota$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k45\_gfacirc1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_finseq\_1 : \iota \Rightarrow o$  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  $v2\_struct\_0 : \iota \Rightarrow o$  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  $k2\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k41\_gfacirc1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k11\_finseq\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $k2\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k29\_twoscomp : \iota$  be given. Assume the following.

$$\begin{aligned} \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ X1))) \Rightarrow ((k2\_msafree2 (k5\_circcomb X0 X1) = k10\_xtuple\_0 X1) \wedge (k3\_msafree2 \\ (k5\_circcomb X0 X1) = k1\_tarski (k4\_tarski X1 X0))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v1\_circcomb X0) \wedge ((v2\_circcomb \\ X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1. ((\neg v2\_struct\_0 X1) \wedge ((v1\_circcomb \\ X1) \wedge ((v2\_circcomb X1) \wedge (l1\_msualg\_1 X1)))) \Rightarrow (k3\_msafree2 (k2\_circcomb \\ X0 X1) = k2\_xboole\_0 (k3\_msafree2 X0) (k3\_msafree2 X1))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. \forall X2. k3\_msafree2 (k41\_gfacirc1 X0 \\ X1 X2) = k1\_enumset1 (k4\_tarski (k10\_finseq\_1 X0 X1) k4\_twoscomp) \\ (k4\_tarski (k10\_finseq\_1 X1 X2) k4\_twoscomp) (k4\_tarski (k10\_finseq\_1 \\ X2 X0) k4\_twoscomp) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(v1\_relat\_1 (k11\_finseq\_1 X0 X1 X2))\wedge(v1\_funct\_1 (k11\_finseq\_1 X0 X1 X2)) \quad (4)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1 X1)\wedge((v1\_funct\_1 X1)\wedge(v1\_finseq\_1 X1)))\Rightarrow((\neg v2\_struct\_0 (k5\_circcomb X0 X1))\wedge((\neg v11\_struct\_0 (k5\_circcomb X0 X1))\wedge(v1\_msualg\_1 (k5\_circcomb X0 X1)))) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.(v1\_relat\_1 (k10\_finseq\_1 X0 X1))\wedge(v1\_funct\_1 (k10\_finseq\_1 X0 X1)) \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((v2\_circcomb X0)\wedge(l1\_msualg\_1 X0)))\wedge((\neg v2\_struct\_0 X1)\wedge((v2\_circcomb X1)\wedge(l1\_msualg\_1 X1))))\Rightarrow((\neg v2\_struct\_0 (k2\_circcomb X0 X1))\wedge((v1\_msualg\_1 (k2\_circcomb X0 X1))\wedge(v2\_circcomb (k2\_circcomb X0 X1)))) \quad (7)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.v1\_finseq\_1 (k11\_finseq\_1 X0 X1 X2) \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((v1\_circcomb X0)\wedge(l1\_msualg\_1 X0)))\wedge((\neg v2\_struct\_0 X1)\wedge((v1\_circcomb X1)\wedge(l1\_msualg\_1 X1))))\Rightarrow((\neg v2\_struct\_0 (k2\_circcomb X0 X1))\wedge((v1\_msualg\_1 (k2\_circcomb X0 X1))\wedge(v1\_circcomb (k2\_circcomb X0 X1)))) \quad (9)$$

Assume the following.

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

Assume the following.

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

Assume the following.

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

Assume the following.

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

Assume the following.

$$\forall X0.\forall X1.k4\_tarski X0 X1 = k2\_tarski (k2\_tarski X0 X1) (k1\_tarski X0) \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.k45\_gfacirc1 X0 X1 X2 = k4\_tarski \\ & (k11\_finseq\_1 (k4\_tarski (k10\_finseq\_1 X0 X1) k4\_twoscomp) (k4\_tarski \\ & (k10\_finseq\_1 X1 X2) k4\_twoscomp) (k4\_tarski (k10\_finseq\_1 X2 \\ & X0) k4\_twoscomp)) k29\_twoscomp \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.k43\_gfacirc1 X0 X1 X2 = k2\_circcomb \\ & (k41\_gfacirc1 X0 X1 X2) (k5\_circcomb k29\_twoscomp (k11\_finseq\_1 \\ & (k4\_tarski (k10\_finseq\_1 X0 X1) k4\_twoscomp) (k4\_tarski (k10\_finseq\_1 \\ & X1 X2) k4\_twoscomp) (k4\_tarski (k10\_finseq\_1 X2 X0) k4\_twoscomp))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.k41\_gfacirc1 X0 X1 X2 = k2\_circcomb \\ & (k2\_circcomb (k5\_circcomb k4\_twoscomp (k10\_finseq\_1 X0 X1)) ( \\ & k5\_circcomb k4\_twoscomp (k10\_finseq\_1 X1 X2))) (k5\_circcomb k4\_twoscomp \\ & (k10\_finseq\_1 X2 X0)) \end{aligned} \quad (17)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.k3\_msafree2 (k43\_gfacirc1 X0 \\ & X1 X2) = k2\_xboole\_0 (k1\_enumset1 (k4\_tarski (k10\_finseq\_1 X0 X1) \\ & k4\_twoscomp) (k4\_tarski (k10\_finseq\_1 X1 X2) k4\_twoscomp) (k4\_tarski \\ & (k10\_finseq\_1 X2 X0) k4\_twoscomp)) (k1\_tarski (k45\_gfacirc1 X0 \\ & X1 X2)) \end{aligned}$$