

t82\_facirc\_1 (TMTkzZCn-  
sTG7UZnUndqMxvKzpKw6nTAs2FE)

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Let  $v1\_xtuple\_0 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_card\_3 : \iota \Rightarrow \iota$  be given. Let  $u3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k15\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k18\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_margrel1 : \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_2 : \iota$  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  $k10\_margrel1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_circcomb : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v4\_msafree2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v6\_circcomb : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k11\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k17\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_binarith : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_circcomb : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v2\_circcomb : \iota \Rightarrow o$  be given. Let  $v3\_circcomb : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (X0 \in u1\_struct\_0 (k15\_facirc\_1 \\ & X0 X1 X2)) \wedge ((X1 \in u1\_struct\_0 (k15\_facirc\_1 X0 X1 X2)) \wedge (X2 \in u1\_struct\_0 \\ & (k15\_facirc\_1 X0 X1 X2))) \end{aligned} \tag{1}$$

Assume the following.

$$\forall X0. \forall X1. (X0 \in X1) \Rightarrow (m1\_subset\_1 X0 X1) \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2\_struct\_0 \\ & X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v1\_circcomb X0) \wedge (l1\_msualg\_1 X0)))) \wedge \\ & (((v4\_msafree2 X1 X0) \wedge ((v6\_circcomb X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \wedge \\ & ((m1\_subset\_1 X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1))) \wedge (m1\_subset\_1 \\ & X3 (u1\_struct\_0 X0)))) \Rightarrow (k11\_facirc\_1 X0 X1 X2 X3 = k1\_funct\_1 X2 \\ & X3) \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(\neg v1\_xtuple\_0 X0) \Rightarrow (\forall X1.(\neg v1\_xtuple\_0 X1) \Rightarrow \\
& (\forall X2.(\neg v1\_xtuple\_0 X2) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (k4\_card\_3 \\
& (u3\_msualg\_1 (k15\_facirc\_1 X0 X1 X2) (k18\_facirc\_1 X0 X1 X2)))) \Rightarrow \\
& (\forall X4.(m1\_subset\_1 X4 k6\_margrel1) \Rightarrow (\forall X5.(m1\_subset\_1 \\
& X5 k6\_margrel1) \Rightarrow (\forall X6.(m1\_subset\_1 X6 k6\_margrel1) \Rightarrow (( \\
& (X4 = k1\_funct\_1 X3 X0) \wedge ((X5 = k1\_funct\_1 X3 X1) \wedge (X6 = k1\_funct\_1 \\
& X3 X2))) \Rightarrow ((k11\_facirc\_1 (k15\_facirc\_1 X0 X1 X2) (k18\_facirc\_1 \\
& X0 X1 X2) (k5\_facirc\_1 (k15\_facirc\_1 X0 X1 X2) (k18\_facirc\_1 X0 X1 \\
& X2) X3 np\_2) (k17\_facirc\_1 X0 X1 X2) = k1\_binarith (k1\_binarith \\
& (k10\_margrel1 X4 X5) (k10\_margrel1 X5 X6)) (k10\_margrel1 X6 X4)) \wedge \\
& ((k1\_funct\_1 (k5\_facirc\_1 (k15\_facirc\_1 X0 X1 X2) (k18\_facirc\_1 \\
& X0 X1 X2) X3 np\_2) (k4\_tarski (k10\_finseq\_1 X0 X1) k3\_facirc\_1) = \\
& k10\_margrel1 X4 X5) \wedge ((k1\_funct\_1 (k5\_facirc\_1 (k15\_facirc\_1 \\
& X0 X1 X2) (k18\_facirc\_1 X0 X1 X2) X3 np\_2) (k4\_tarski (k10\_finseq\_1 \\
& X1 X2) k3\_facirc\_1) = k10\_margrel1 X5 X6) \wedge (k1\_funct\_1 (k5\_facirc\_1 \\
& (k15\_facirc\_1 X0 X1 X2) (k18\_facirc\_1 X0 X1 X2) X3 np\_2) (k4\_tarski \\
& (k10\_finseq\_1 X2 X0) k3\_facirc\_1) = k10\_margrel1 X6 X4))))))))) \\
& \tag{4}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(v3\_msualg\_1 (k18\_facirc\_1 \\
& X0 X1 X2) (k15\_facirc\_1 X0 X1 X2)) \wedge ((v4\_msafree2 (k18\_facirc\_1 \\
& X0 X1 X2) (k15\_facirc\_1 X0 X1 X2)) \wedge ((v4\_circcomb (k18\_facirc\_1 \\
& X0 X1 X2) (k15\_facirc\_1 X0 X1 X2)) \wedge ((v6\_circcomb (k18\_facirc\_1 \\
& X0 X1 X2) (k15\_facirc\_1 X0 X1 X2)) \wedge (l3\_msualg\_1 (k18\_facirc\_1 X0 \\
& X1 X2) (k15\_facirc\_1 X0 X1 X2)))))) \\
& \tag{5}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(\neg v2\_struct\_0 (k15\_facirc\_1 \\
& X0 X1 X2)) \wedge ((\neg v11\_struct\_0 (k15\_facirc\_1 X0 X1 X2)) \wedge ((v1\_msualg\_1 \\
& (k15\_facirc\_1 X0 X1 X2)) \wedge ((v1\_circcomb (k15\_facirc\_1 X0 X1 X2)) \wedge \\
& ((v2\_circcomb (k15\_facirc\_1 X0 X1 X2)) \wedge ((v3\_circcomb (k15\_facirc\_1 \\
& X0 X1 X2)) \wedge (l1\_msualg\_1 (k15\_facirc\_1 X0 X1 X2)))))) \\
& \tag{6}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v1\_circcomb X0) \wedge (l1\_msualg\_1 X0)))) \wedge \\
& (((v4\_msafree2 X1 X0) \wedge ((v6\_circcomb X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \wedge \\
& ((m1\_subset\_1 X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1))) \wedge (m1\_subset\_1 \\
& X3 (u1\_struct\_0 X0)))) \Rightarrow (m1\_subset\_1 (k11\_facirc\_1 X0 X1 X2 X3) \\
& k6\_margrel1) \\
& \tag{7}
\end{aligned}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.(\neg v1\_xtuple\_0 X0) \Rightarrow (\forall X1.(\neg v1\_xtuple\_0 X1) \Rightarrow \\ & (\forall X2.(\neg v1\_xtuple\_0 X2) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (k4\_card\_3 \\ & (u3\_msualg\_1 (k15\_facirc\_1 X0 X1 X2) (k18\_facirc\_1 X0 X1 X2)))) \Rightarrow \\ & (\forall X4.(m1\_subset\_1 X4 k6\_margrel1) \Rightarrow (\forall X5.(m1\_subset\_1 \\ & X5 k6\_margrel1) \Rightarrow (((X4 = k1\_funct\_1 X3 X0) \wedge (X5 = k1\_funct\_1 X3 X2)) \Rightarrow \\ & (k1\_funct\_1 (k5\_facirc\_1 (k15\_facirc\_1 X0 X1 X2) (k18\_facirc\_1 \\ & X0 X1 X2) X3 np\_2) (k4\_tarski (k10\_finseq\_1 X2 X0) k3\_facirc\_1) = \\ & k10\_margrel1 X5 X4)))))) \end{aligned}$$