

## t90\_facirc\_1

(TMMg33UgB8L8WgXTi3t7qcBtsAAz1qqHXz3)

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Let  $k12\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_msafree2 : \iota \Rightarrow \iota$  be given. Let  $k19\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k17\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  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  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_finseq\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_2 : \iota$  be given. Let  $k6\_margrel1 : \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v3\_circcomb : \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_facirc\_1 : \iota$  be given. Let  $k15\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0. \forall X1. \forall X2. \neg (X0 \in X1) \wedge ((m1\_subset\_1 X1 (k1\_zfmisc\_1 X2)) \wedge (v1\_xboole\_0 X2)) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. (m1\_subset\_1 X0 X1) \Rightarrow ((v1\_xboole\_0 X1) \vee (X0 \in X1)) \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v1\_circcomb X0) \wedge ((v2\_circcomb X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1. ((\neg v2\_struct\_0 X1) \wedge ((v1\_circcomb X1) \wedge ((v2\_circcomb X1) \wedge (l1\_msualg\_1 X1)))) \Rightarrow (\forall X2. (X2 \in k3\_msafree2 X0) \Rightarrow ((X2 \in k3\_msafree2 (k2\_circcomb X0 X1)) \wedge (X2 \in k3\_msafree2 (k2\_circcomb X1 X0)))))) \quad (3) \end{aligned}$$

Assume the following.

$$\forall X0. \forall X1. ((\neg v1\_xboole\_0 X0) \wedge ((\neg v1\_xboole\_0 X1) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 X0)))) \Rightarrow (\forall X2. (m2\_subset\_1 X2 X0 X1) \Leftrightarrow (m1\_subset\_1 X2 X1)) \quad (4)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 X0))) \Rightarrow (\neg v1\_xboole\_0 (k3\_msafree2 X0)) \quad (5)$$

Assume the following.

$$\forall X0. \exists X1. m1\_subset\_1 X1 X0 \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. ((v1\_funct\_1 X3) \wedge \\ & ((v1\_funct\_2 X3 (k4\_finseq\_2 np\_2 k6\_margrel1) k6\_margrel1) \wedge \\ & (m1\_subset\_1 X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k4\_finseq\_2 np\_2 \\ & k6\_margrel1) k6\_margrel1)))))) \Rightarrow ((\neg v2\_struct\_0 (k8\_facirc\_1 \\ X0 X1 X2 X3)) \wedge ((\neg v11\_struct\_0 (k8\_facirc\_1 X0 X1 X2 X3)) \wedge ((v1\_msualg\_1 \\ (k8\_facirc\_1 X0 X1 X2 X3)) \wedge ((v1\_circcomb (k8\_facirc\_1 X0 X1 X2 X3)) \wedge \\ ((v2\_circcomb (k8\_facirc\_1 X0 X1 X2 X3)) \wedge ((v3\_circcomb (k8\_facirc\_1 \\ X0 X1 X2 X3)) \wedge (l1\_msualg\_1 (k8\_facirc\_1 X0 X1 X2 X3)))))))))) \quad (7) \end{aligned}$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_msualg\_1 X0)) \Rightarrow (m1\_subset\_1 (k3\_msafree2 X0) (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \quad (8)$$

Assume the following.

$$(v1\_funct\_1 k1\_facirc\_1) \wedge ((v1\_funct\_2 k1\_facirc\_1 (k4\_finseq\_2 np\_2 k6\_margrel1) k6\_margrel1) \wedge (m1\_subset\_1 k1\_facirc\_1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k4\_finseq\_2 np\_2 k6\_margrel1) k6\_margrel1)))) \quad (9)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. m2\_subset\_1 (k17\_facirc\_1 X0 X1 X2) (u1\_struct\_0 (k15\_facirc\_1 X0 X1 X2)) (k3\_msafree2 (k15\_facirc\_1 X0 X1 X2)) \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (\neg v2\_struct\_0 (k15\_facirc\_1 \\ X0 X1 X2)) \wedge ((\neg v11\_struct\_0 (k15\_facirc\_1 X0 X1 X2)) \wedge ((v1\_msualg\_1 \\ (k15\_facirc\_1 X0 X1 X2)) \wedge ((v1\_circcomb (k15\_facirc\_1 X0 X1 X2)) \wedge \\ ((v2\_circcomb (k15\_facirc\_1 X0 X1 X2)) \wedge ((v3\_circcomb (k15\_facirc\_1 \\ X0 X1 X2)) \wedge (l1\_msualg\_1 (k15\_facirc\_1 X0 X1 X2)))))))) \quad (11) \end{aligned}$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. m2\_subset\_1 (k12\_facirc\_1 X0 X1 X2) (u1\_struct\_0 (k8\_facirc\_1 X0 X1 X2 k1\_facirc\_1)) (k3\_msafree2 (k8\_facirc\_1 X0 X1 X2 k1\_facirc\_1)) \quad (12)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.k19\_facirc\_1 X0 X1 X2 = k2\_circcomb (k8\_facirc\_1 X0 X1 X2 k1\_facirc\_1) (k15\_facirc\_1 X0 X1 X2) \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.k12\_facirc\_1 X0 X1 X2 = k9\_facirc\_1 X0 X1 X2 k1\_facirc\_1 \quad (14)$$

**Theorem 1**

$$\forall X0.\forall X1.\forall X2.(k12\_facirc\_1 X0 X1 X2 \in k3\_msafree2 (k19\_facirc\_1 X0 X1 X2)) \wedge (k17\_facirc\_1 X0 X1 X2 \in k3\_msafree2 (k19\_facirc\_1 X0 X1 X2))$$