

## t7\_facirc\_2

(TMR3nVSdKy1Lv9tt5bbNnoKACF9cLfciiSf)

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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  $k3\_facirc\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_numbers : \iota$  be given. Let  $k5\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_margrel1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_margrel1 : \iota$  be given. Let  $k4\_finseq\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_margrel1 : \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $k4\_facirc\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_facirc\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_ordinal1 : \iota$  be given. Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_msafree2 : \iota \Rightarrow \iota$  be given. Let  $v3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_msafree2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_circcomb : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v6\_circcomb : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_numbers : \iota$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_nat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_1 : \iota$  be given. Let  $k17\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k19\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_circcomb : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k20\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$m1\_subset\_1 \ k1\_xboole\_0 \ k4\_ordinal1 \tag{1}$$

Assume the following.

$$k6\_numbers = k1\_xboole\_0 \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((v7\_ordinal1 \ X0) \wedge (((v1\_relat\_1 \\ & \ X1) \wedge ((v1\_funct\_1 \ X1) \wedge (v1\_finseq\_1 \ X1))) \wedge ((v1\_relat\_1 \ X2) \wedge \\ & (v1\_funct\_1 \ X2) \wedge (v1\_finseq\_1 \ X2)))) \Rightarrow (m2\_subset\_1 \ (k5\_facirc\_2 \\ & \ X0 \ X1 \ X2) \ (u1\_struct\_0 \ (k3\_facirc\_2 \ X0 \ X1 \ X2)) \ (k3\_msafree2 \ (k3\_facirc\_2 \\ & \ X0 \ X1 \ X2))) \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((v7\_ordinal1\ X0) \wedge (((v1\_relat\_1 \\ & X1) \wedge ((v1\_funct\_1\ X1) \wedge (v1\_finseq\_1\ X1))) \wedge ((v1\_relat\_1\ X2) \wedge \\ & (v1\_funct\_1\ X2) \wedge (v1\_finseq\_1\ X2)))) \Rightarrow ((v3\_msualg\_1\ (k4\_facirc\_2 \\ & X0\ X1\ X2)\ (k3\_facirc\_2\ X0\ X1\ X2)) \wedge ((v4\_msafree2\ (k4\_facirc\_2\ X0 \\ & X1\ X2)\ (k3\_facirc\_2\ X0\ X1\ X2)) \wedge ((v4\_circcomb\ (k4\_facirc\_2\ X0\ X1 \\ & X2)\ (k3\_facirc\_2\ X0\ X1\ X2)) \wedge ((v6\_circcomb\ (k4\_facirc\_2\ X0\ X1\ X2) \\ & (k3\_facirc\_2\ X0\ X1\ X2)) \wedge (l3\_msualg\_1\ (k4\_facirc\_2\ X0\ X1\ X2)\ (k3\_facirc\_2 \\ & X0\ X1\ X2)))))) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0. \forall X1. k4\_tarski\ X0\ X1 = k2\_tarski\ (k2\_tarski\ X0\ X1)\ (k1\_tarski\ X0) \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. (v7\_ordinal1\ X0) \Rightarrow (\forall X1. ((v1\_relat\_1\ X1) \wedge (( \\ & v1\_funct\_1\ X1) \wedge (v1\_finseq\_1\ X1))) \Rightarrow (\forall X2. ((v1\_relat\_1 \\ & X2) \wedge ((v1\_funct\_1\ X2) \wedge (v1\_finseq\_1\ X2))) \Rightarrow (\forall X3. (m2\_subset\_1 \\ & X3\ (u1\_struct\_0\ (k3\_facirc\_2\ X0\ X1\ X2))\ (k3\_msafree2\ (k3\_facirc\_2 \\ & X0\ X1\ X2))) \Rightarrow ((X3 = k5\_facirc\_2\ X0\ X1\ X2) \Leftrightarrow (\exists X4. ((v1\_relat\_1 \\ & X4) \wedge ((v4\_relat\_1\ X4\ k5\_numbers) \wedge ((v1\_funct\_1\ X4) \wedge (v1\_partfun1 \\ & X4\ k5\_numbers)))) \wedge ((X3 = k1\_funct\_1\ X4\ X0) \wedge ((k1\_funct\_1\ X4\ k6\_numbers = \\ & k4\_tarski\ k1\_xboole\_0\ (k1\_margrel1\ k6\_margrel1\ (k4\_finseq\_2 \\ & k6\_numbers\ k6\_margrel1)\ k7\_margrel1))) \wedge (\forall X5. (v7\_ordinal1 \\ & X5) \Rightarrow (\forall X6. (X6 = k1\_funct\_1\ X4\ X5) \Rightarrow (k1\_funct\_1\ X4\ (k1\_nat\_1 \\ & X5\ np\_1) = k17\_facirc\_1\ (k1\_funct\_1\ X1\ (k1\_nat\_1\ X5\ np\_1))\ (k1\_funct\_1 \\ & X2\ (k1\_nat\_1\ X5\ np\_1)\ X6)))))))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned}
& \forall X0.(v7\_ordinal1\ X0) \Rightarrow (\forall X1.((v1\_relat\_1\ X1) \wedge (( \\
& \quad v1\_funct\_1\ X1) \wedge (v1\_finseq\_1\ X1))) \Rightarrow (\forall X2.((v1\_relat\_1 \\
& \quad X2) \wedge ((v1\_funct\_1\ X2) \wedge (v1\_finseq\_1\ X2))) \Rightarrow (\forall X3.((v3\_msualg\_1 \\
& \quad X3\ (k3\_facirc\_2\ X0\ X1\ X2)) \wedge ((v4\_msafree2\ X3\ (k3\_facirc\_2\ X0\ X1\ X2)) \wedge \\
& \quad ((v4\_circcomb\ X3\ (k3\_facirc\_2\ X0\ X1\ X2)) \wedge ((v6\_circcomb\ X3\ (k3\_facirc\_2 \\
& \quad X0\ X1\ X2)) \wedge (l3\_msualg\_1\ X3\ (k3\_facirc\_2\ X0\ X1\ X2)))))) \Rightarrow ((X3 = k4\_facirc\_2 \\
& \quad X0\ X1\ X2) \Leftrightarrow (\exists X4.((v1\_relat\_1\ X4) \wedge ((v4\_relat\_1\ X4\ k5\_numbers) \wedge \\
& \quad ((v1\_funct\_1\ X4) \wedge (v1\_partfun1\ X4\ k5\_numbers)))) \wedge (\exists X5. \\
& \quad ((v1\_relat\_1\ X5) \wedge ((v4\_relat\_1\ X5\ k5\_numbers) \wedge ((v1\_funct\_1\ X5) \wedge \\
& \quad (v1\_partfun1\ X5\ k5\_numbers)))) \wedge (\exists X6.((v1\_relat\_1\ X6) \wedge \\
& \quad ((v4\_relat\_1\ X6\ k5\_numbers) \wedge ((v1\_funct\_1\ X6) \wedge (v1\_partfun1\ X6 \\
& \quad k5\_numbers)))) \wedge ((k3\_facirc\_2\ X0\ X1\ X2 = k1\_funct\_1\ X4\ X0) \wedge ((X3 = \\
& \quad k1\_funct\_1\ X5\ X0) \wedge ((k1\_funct\_1\ X4\ k6\_numbers = k5\_circcomb\ (k1\_margrel1 \\
& \quad k6\_margrel1\ (k4\_finseq\_2\ k6\_numbers\ k6\_margrel1)\ k7\_margrel1) \\
& \quad k1\_xboole\_0) \wedge ((k1\_funct\_1\ X5\ k6\_numbers = k7\_circcomb\ k1\_xboole\_0 \\
& \quad k6\_margrel1\ (k1\_margrel1\ k6\_margrel1\ (k4\_finseq\_2\ k6\_numbers \\
& \quad k6\_margrel1)\ k7\_margrel1)\ k1\_xboole\_0) \wedge ((k1\_funct\_1\ X6\ k6\_numbers = \\
& \quad k4\_tarSKI\ k1\_xboole\_0\ (k1\_margrel1\ k6\_margrel1\ (k4\_finseq\_2 \\
& \quad k6\_numbers\ k6\_margrel1)\ k7\_margrel1)) \wedge (\forall X7.(v7\_ordinal1 \\
& \quad X7) \Rightarrow (\forall X8.((-v2\_struct\_0\ X8) \wedge (l1\_msualg\_1\ X8)) \Rightarrow (\forall X9. \\
& \quad ((v4\_msualg\_1\ X9\ X8) \wedge (l3\_msualg\_1\ X9\ X8)) \Rightarrow (\forall X10.((X8 = \\
& \quad k1\_funct\_1\ X4\ X7) \wedge ((X9 = k1\_funct\_1\ X5\ X7) \wedge (X10 = k1\_funct\_1\ X6\ X7))) \Rightarrow \\
& \quad ((k1\_funct\_1\ X4\ (k1\_nat\_1\ X7\ np\_1) = k2\_circcomb\ X8\ (k19\_facirc\_1 \\
& \quad (k1\_funct\_1\ X1\ (k1\_nat\_1\ X7\ np\_1))\ (k1\_funct\_1\ X2\ (k1\_nat\_1\ X7 \\
& \quad np\_1))\ X10)) \wedge ((k1\_funct\_1\ X5\ (k1\_nat\_1\ X7\ np\_1) = k3\_circcomb \\
& \quad X8\ (k19\_facirc\_1\ (k1\_funct\_1\ X1\ (k1\_nat\_1\ X7\ np\_1))\ (k1\_funct\_1 \\
& \quad X2\ (k1\_nat\_1\ X7\ np\_1))\ X10)\ X9\ (k20\_facirc\_1\ (k1\_funct\_1\ X1\ (k1\_nat\_1 \\
& \quad X7\ np\_1))\ (k1\_funct\_1\ X2\ (k1\_nat\_1\ X7\ np\_1))\ X10)) \wedge (k1\_funct\_1 \\
& \quad X6\ (k1\_nat\_1\ X7\ np\_1) = k17\_facirc\_1\ (k1\_funct\_1\ X1\ (k1\_nat\_1\ X7 \\
& \quad np\_1))\ (k1\_funct\_1\ X2\ (k1\_nat\_1\ X7\ np\_1))\ X10))))))))))))) \\
& \hspace{15em} (7)
\end{aligned}$$

Assume the following.

$$\forall X0.\forall X1.k2\_tarSKI\ X0\ X1 = k2\_tarSKI\ X1\ X0 \tag{8}$$

Assume the following.

$$\forall X0.(m1\_subset\_1\ X0\ k4\_ordinal1) \Rightarrow (v7\_ordinal1\ X0) \tag{9}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finseq\_1 X0))) \Rightarrow \\ & (\forall X1.((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ & X1)))) \Rightarrow ((k3\_facirc\_2 k6\_numbers X0 X1 = k5\_circcomb (k1\_margrel1 \\ & k6\_margrel1 (k4\_finseq\_2 k6\_numbers k6\_margrel1) k7\_margrel1) \\ & k1\_xboole\_0) \wedge ((k4\_facirc\_2 k6\_numbers X0 X1 = k7\_circcomb k1\_xboole\_0 \\ & k6\_margrel1 (k1\_margrel1 k6\_margrel1 (k4\_finseq\_2 k6\_numbers \\ & k6\_margrel1) k7\_margrel1) k1\_xboole\_0) \wedge (k5\_facirc\_2 k6\_numbers \\ & X0 X1 = k4\_tarski k1\_xboole\_0 (k1\_margrel1 k6\_margrel1 (k4\_finseq\_2 \\ & k6\_numbers k6\_margrel1) k7\_margrel1)))))) \end{aligned}$$