

# t6\_circcmb3 (TMbaRnPMxg- Bet2BCbTEsJUi4B1pyL2ZNQxQ)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_msafree2 : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_msafree2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  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  $v1\_circcmb3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_msafree2 : \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_circcmb3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r8\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k5\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_circcmb3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_facirc\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_numbers : \iota$  be given. Let  $k4\_ordinal1 : \iota$  be given. Let  $v4\_funct\_1 : \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l2\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v2\_relat\_1 : \iota \Rightarrow o$  be given. Let  $l5\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_msafree2 \\ & \quad X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1.((v4\_msualg\_1 X1 X0) \wedge (( \\ & \quad v4\_msafree2 X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \Rightarrow (\forall X2.(m1\_subset\_1 \\ & \quad X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1))) \Rightarrow ((v1\_circcmb3 X2 X0 X1) \Rightarrow (r8\_pboole \\ & \quad (u1\_struct\_0 X0) (k1\_circcmb3 X0 X1 X2) (k5\_facirc\_1 X0 X1 X2) (k2\_circcmb3 \\ & \quad \quad X0 X1 X2)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_msafree2 \\ & \quad X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1.((v4\_msualg\_1 X1 X0) \wedge (( \\ & \quad v4\_msafree2 X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \Rightarrow (\forall X2.(m1\_subset\_1 \\ & \quad X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1))) \Rightarrow (\forall X3.(X3 \in k2\_msafree2 \\ & \quad \quad X0) \Rightarrow (r1\_facirc\_1 X0 X1 X2 X3)))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge(((v1\_relat\_1 \\ & X1)\wedge((v4\_relat\_1 X1 X0)\wedge((v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\wedge \\ & ((v1\_relat\_1 X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 \\ & X2 X0))))))\Rightarrow((r8\_pboole X0 X1 X2)\Leftrightarrow(X1 = X2)) \end{aligned} \quad (3)$$

Assume the following.

$$k5\_numbers = k4\_ordinal1 \quad (4)$$

Assume the following.

$$\forall X0.((v1\_relat\_1 X0)\wedge(v1\_funct\_1 X0))\Rightarrow(v4\_funct\_1 (k4\_card\_3 X0)) \quad (5)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_struct\_0 X0))\Rightarrow(\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((l1\_struct\_0 X0)\wedge((v4\_msualg\_1 X1 X0)\wedge \\ & (l2\_msualg\_1 X1 X0)))\Rightarrow((v1\_relat\_1 (u3\_msualg\_1 X0 X1))\wedge((v2\_relat\_1 \\ & (u3\_msualg\_1 X0 X1))\wedge((v4\_relat\_1 (u3\_msualg\_1 X0 X1) (u1\_struct\_0 \\ & X0))\wedge((v1\_funct\_1 (u3\_msualg\_1 X0 X1))\wedge(v1\_partfun1 (u3\_msualg\_1 \\ & X0 X1) (u1\_struct\_0 X0)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0.(l5\_struct\_0 X0)\Rightarrow(l1\_struct\_0 X0) \quad (8)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_msualg\_1 X0))\Rightarrow(\forall X1. (l3\_msualg\_1 X1 X0)\Rightarrow(l2\_msualg\_1 X1 X0)) \quad (9)$$

Assume the following.

$$\forall X0.(l1\_msualg\_1 X0)\Rightarrow(l5\_struct\_0 X0) \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\ & X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_msafree2 X0)\wedge(l1\_msualg\_1 X0))))\wedge \\ & (((v4\_msualg\_1 X1 X0)\wedge((v4\_msafree2 X1 X0)\wedge(l3\_msualg\_1 X1 X0)))\wedge \\ & ((m1\_subset\_1 X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1)))\wedge(v7\_ordinal1 \\ & X3)))\Rightarrow(m1\_subset\_1 (k5\_facirc\_1 X0 X1 X2 X3) (k4\_card\_3 (u3\_msualg\_1 \\ & X0 X1))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 \\ X0)\wedge((v2\_msafree2 X0)\wedge(l1\_msualg\_1 X0))))\wedge(((v4\_msualg\_1 X1 \\ X0)\wedge((v4\_msafree2 X1 X0)\wedge(l3\_msualg\_1 X1 X0)))\wedge(m1\_subset\_1 \\ X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1))))))\Rightarrow(m1\_subset\_1 (k2\_circcmb3 \\ X0 X1 X2) k5\_numbers) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 \\ X0)\wedge((v2\_msafree2 X0)\wedge(l1\_msualg\_1 X0))))\wedge(((v4\_msualg\_1 X1 \\ X0)\wedge((v4\_msafree2 X1 X0)\wedge(l3\_msualg\_1 X1 X0)))\wedge(m1\_subset\_1 \\ X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1))))))\Rightarrow(m1\_subset\_1 (k1\_circcmb3 \\ X0 X1 X2) (k4\_card\_3 (u3\_msualg\_1 X0 X1))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_msafree2 \\ X0)\wedge(l1\_msualg\_1 X0))))\Rightarrow(\forall X1.((v4\_msualg\_1 X1 X0)\wedge(( \\ v4\_msafree2 X1 X0)\wedge(l3\_msualg\_1 X1 X0)))\Rightarrow(\forall X2.(m1\_subset\_1 \\ X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1)))\Rightarrow(\forall X3.(r1\_facirc\_1 \\ X0 X1 X2 X3)\Leftrightarrow(\forall X4.(v7\_ordinal1 X4)\Rightarrow(k1\_funct\_1 (k5\_facirc\_1 \\ X0 X1 X2 X4) X3 = k1\_funct\_1 X2 X3)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0.(m1\_subset\_1 X0 k4\_ordinal1)\Rightarrow(v7\_ordinal1 X0) \quad (15)$$

Assume the following.

$$\forall X0.(v4\_funct\_1 X0)\Rightarrow(\forall X1.(m1\_subset\_1 X1 X0)\Rightarrow( \\ (v1\_relat\_1 X1)\wedge(v1\_funct\_1 X1))) \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1\_relat\_1 X1)\wedge((v2\_relat\_1 X1)\wedge((v4\_relat\_1 \\ X1 X0)\wedge((v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))))\Rightarrow(\forall X2. \\ (m1\_subset\_1 X2 (k4\_card\_3 X1))\Rightarrow(v1\_partfun1 X2 X0)) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1\_relat\_1 X1)\wedge((v2\_relat\_1 X1)\wedge((v4\_relat\_1 \\ X1 X0)\wedge(v1\_funct\_1 X1))))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (k4\_card\_3 \\ X1))\Rightarrow(v4\_relat\_1 X2 X0)) \end{aligned} \quad (18)$$

### Theorem 1

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_msafree2 \\ X0)\wedge(l1\_msualg\_1 X0))))\Rightarrow(\forall X1.((v4\_msualg\_1 X1 X0)\wedge(( \\ v4\_msafree2 X1 X0)\wedge(l3\_msualg\_1 X1 X0)))\Rightarrow(\forall X2.(m1\_subset\_1 \\ X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1)))\Rightarrow((v1\_circcmb3 X2 X0 X1)\Rightarrow(\forall X3. \\ (X3 \in k2\_msafree2 X0)\Rightarrow(k1\_funct\_1 (k1\_circcmb3 X0 X1 X2) X3 = k1\_funct\_1 \\ X2 X3)))))) \end{aligned}$$