

t29_circcmb3 (TM-
FjhKngc1RmXwhpQAgEHVwdhW3NxbUeRqu)

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Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $v1_finset_1 : \iota \Rightarrow o$ be given. Let $m1_circcmb3 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m2_circcmb3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4_circcomb : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_circcomb : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_circcomb : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $l3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r1_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r2_circcomb : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4_msafree2 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $v1_circcomb : \iota \Rightarrow o$ be given. Let $v2_circcomb : \iota \Rightarrow o$ be given. Let $v5_circcomb : \iota \Rightarrow o$ be given. Let $r1_circcomb : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \Rightarrow (\forall X1. \\ & ((\neg v2_struct_0 X1) \wedge (l1_msualg_1 X1)) \Rightarrow (\forall X2.((v4_msualg_1 \\ & X2 X0) \wedge (l3_msualg_1 X2 X0)) \Rightarrow (\forall X3.((v4_msualg_1 X3 X1) \wedge \\ & (l3_msualg_1 X3 X1)) \Rightarrow (((v4_circcomb X2 X0) \wedge ((v4_circcomb X3 X1) \wedge \\ & (r1_partfun1 (u3_msualg_1 X0 X2) (u3_msualg_1 X1 X3)))) \Rightarrow (v4_circcomb \\ & (k3_circcomb X0 X1 X2 X3) (k2_circcomb X0 X1)))))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v1_xboole_0 X0) \wedge (v1_finset_1 X0)) \Rightarrow (\forall X1. \\ & (m1_circcmb3 X1 X0) \Rightarrow (\forall X2.(m1_circcmb3 X2 X0) \Rightarrow (\forall X3. \\ & (m2_circcmb3 X3 X0 X1) \Rightarrow (\forall X4.(m2_circcmb3 X4 X0 X2) \Rightarrow (r2_circcomb \\ & X1 X2 X3 X4)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v1_xboole_0 X0) \wedge (v1_finset_1 X0)) \wedge \\ & (m1_circcmb3 X1 X0)) \Rightarrow (\forall X2.(m2_circcmb3 X2 X0 X1) \Rightarrow ((v4_msafree2 \\ & X2 X1) \wedge (l3_msualg_1 X2 X1))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v1_xboole_0 X0) \wedge (v1_finset_1 X0)) \Rightarrow (\forall X1. \\ & (m1_circcmb3 X1 X0) \Rightarrow ((\neg v2_struct_0 X1) \wedge ((\neg v11_struct_0 X1) \wedge \\ & ((v1_circcomb X1) \wedge ((v2_circcomb X1) \wedge ((v5_circcomb X1) \wedge (l1_msualg_1 \\ & X1))))))) \end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \Rightarrow (\forall X1. \\ & ((\neg v2_struct_0 X1) \wedge (l1_msualg_1 X1)) \Rightarrow (\forall X2.(l3_msualg_1 \\ & X2 X0) \Rightarrow (\forall X3.(l3_msualg_1 X3 X1) \Rightarrow ((r2_circcomb X0 X1 X2 X3) \Leftrightarrow \\ & ((r1_circcomb X0 X1) \wedge ((r1_partfun1 (u3_msualg_1 X0 X2) (u3_msualg_1 \\ & X1 X3)) \wedge (r1_partfun1 (u4_msualg_1 X0 X2) (u4_msualg_1 X1 X3))))))) \end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v1_xboole_0 X0) \wedge (v1_finset_1 X0)) \wedge \\ & (m1_circcmb3 X1 X0)) \Rightarrow (\forall X2.(m2_circcmb3 X2 X0 X1) \Rightarrow ((v4_msualg_1 \\ & X2 X1) \wedge (v4_circcomb X2 X1))) \end{aligned} \tag{6}$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v1_xboole_0 X0) \wedge (v1_finset_1 X0)) \Rightarrow (\forall X1. \\ & (m1_circcmb3 X1 X0) \Rightarrow (\forall X2.(m1_circcmb3 X2 X0) \Rightarrow (\forall X3. \\ & (m2_circcmb3 X3 X0 X1) \Rightarrow (\forall X4.(m2_circcmb3 X4 X0 X2) \Rightarrow (v4_circcomb \\ & (k3_circcomb X1 X2 X3 X4) (k2_circcomb X1 X2)))))) \end{aligned}$$