

# t56\_circترم1 (TMZag- mgPP2zhopPf8SvddQKidT1ZSmYD97D)

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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  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  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  $r5\_circترم1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  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  $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_circuit2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k6\_circuit2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_funct\_1 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r8\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_funct\_1 : \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  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. Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_msafree2 \\
& \quad X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((\neg \\
& \quad v11\_struct\_0 X1) \wedge ((v2\_msafree2 X1) \wedge (l1\_msualg\_1 X1)))) \Rightarrow (\forall X2. \\
& \quad ((v1\_relat\_1 X2) \wedge (v1\_funct\_1 X2)) \Rightarrow (\forall X3.((v1\_relat\_1 \\
& \quad X3) \wedge (v1\_funct\_1 X3)) \Rightarrow (\forall X4.((v4\_msualg\_1 X4 X0) \wedge ((v4\_msafree2 \\
& \quad X4 X0) \wedge (l3\_msualg\_1 X4 X0))) \Rightarrow (\forall X5.((v4\_msualg\_1 X5 X1) \wedge \\
& \quad ((v4\_msafree2 X5 X1) \wedge (l3\_msualg\_1 X5 X1))) \Rightarrow ((r5\_circترم1 X0 X1 \\
& \quad X2 X3 X4 X5) \Rightarrow (\forall X6.(m1\_subset\_1 X6 (k4\_card\_3 (u3\_msualg\_1 \\
& \quad X0 X4))) \Rightarrow (\forall X7.(m1\_subset\_1 X7 (k4\_card\_3 (u3\_msualg\_1 \\
& \quad X1 X5)))) \Rightarrow ((X6 = k3\_relat\_1 X2 X7) \Rightarrow (k6\_circuit2 X0 X4 X6 = k3\_relat\_1 \\
& \quad X2 (k6\_circuit2 X1 X5 X7))))))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_msafree2 \\
& \quad X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((\neg \\
& \quad v11\_struct\_0 X1) \wedge ((v2\_msafree2 X1) \wedge (l1\_msualg\_1 X1)))) \Rightarrow (\forall X2. \\
& \quad ((v1\_relat\_1 X2) \wedge (v1\_funct\_1 X2)) \Rightarrow (\forall X3.((v1\_relat\_1 \\
& \quad X3) \wedge (v1\_funct\_1 X3)) \Rightarrow (\forall X4.((v4\_msualg\_1 X4 X0) \wedge ((v4\_msafree2 \\
& \quad X4 X0) \wedge (l3\_msualg\_1 X4 X0)))) \Rightarrow (\forall X5.((v4\_msualg\_1 X5 X1) \wedge \\
& \quad ((v4\_msafree2 X5 X1) \wedge (l3\_msualg\_1 X5 X1)))) \Rightarrow ((r5\_circstrm1 X0 X1 \\
& \quad X2 X3 X4 X5) \Rightarrow (\forall X6.(m1\_subset\_1 X6 (k4\_card\_3 (u3\_msualg\_1 \\
& \quad X0 X4))) \Rightarrow (\forall X7.(m1\_subset\_1 X7 (k4\_card\_3 (u3\_msualg\_1 \\
& \quad X1 X5)))) \Rightarrow ((X6 = k3\_relat\_1 X2 X7) \Leftrightarrow (X7 = k3\_relat\_1 (k2\_funct\_1 X2 \\
& \quad X6)))))))))
\end{aligned} \tag{2}$$

Assume the following.

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

Assume the following.

$$\forall X0. ((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow (v4\_funct\_1 (k4\_card\_3 X0)) \tag{4}$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. ((l1\_struct\_0 X0) \wedge ((v4\_msualg\_1 X1 X0) \wedge \\
& \quad (l2\_msualg\_1 X1 X0))) \Rightarrow ((v1\_relat\_1 (u3\_msualg\_1 X0 X1)) \wedge ((v2\_relat\_1 \\
& \quad (u3\_msualg\_1 X0 X1)) \wedge ((v4\_relat\_1 (u3\_msualg\_1 X0 X1) (u1\_struct\_0 \\
& \quad X0)) \wedge ((v1\_funct\_1 (u3\_msualg\_1 X0 X1)) \wedge (v1\_partfun1 (u3\_msualg\_1 \\
& \quad X0 X1) (u1\_struct\_0 X0))))))
\end{aligned} \tag{6}$$

Assume the following.

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

Assume the following.

$$\forall X0. (l5\_struct\_0 X0) \Rightarrow (l1\_struct\_0 X0) \tag{8}$$

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.

$$\begin{aligned} \forall X0. \forall X1. \forall X2. (&((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 \\ &X0) \wedge ((v2\_msafree2 X0) \wedge (l1\_msualg\_1 X0)))) \wedge (((v4\_msualg\_1 X1 \\ &X0) \wedge ((v4\_msafree2 X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \wedge (m1\_subset\_1 \\ &X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1)))) \Rightarrow (m1\_subset\_1 (k6\_circuit2 \\ &X0 X1 X2) (k4\_card\_3 (u3\_msualg\_1 X0 X1))) \end{aligned} \quad (11)$$

Assume the following.

$$\forall X0. \forall X1. v1\_relat\_1 (k3\_relat\_1 X0 X1) \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0. (&(\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_msafree2 \\ &X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1. ((v4\_msualg\_1 X1 X0) \wedge (( \\ &v4\_msafree2 X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \Rightarrow (\forall X2. (m1\_subset\_1 \\ &X2 (k4\_card\_3 (u3\_msualg\_1 X0 X1))) \Rightarrow ((v1\_circuit2 X2 X0 X1) \Leftrightarrow (r8\_pboole \\ &(u1\_struct\_0 X0) X2 (k6\_circuit2 X0 X1 X2)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\forall X0. (v4\_funct\_1 X0) \Rightarrow (\forall X1. (m1\_subset\_1 X1 X0) \Rightarrow (v1\_relat\_1 X1) \wedge (v1\_funct\_1 X1)) \quad (14)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. (&(v1\_relat\_1 X1) \wedge ((v2\_relat\_1 X1) \wedge ((v4\_relat\_1 \\ &X1 X0) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0)))) \Rightarrow (\forall X2. \\ &(m1\_subset\_1 X2 (k4\_card\_3 X1)) \Rightarrow (v1\_partfun1 X2 X0)) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. (&(v1\_relat\_1 X1) \wedge ((v2\_relat\_1 X1) \wedge ((v4\_relat\_1 \\ &X1 X0) \wedge (v1\_funct\_1 X1)))) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (k4\_card\_3 \\ &X1)) \Rightarrow (v4\_relat\_1 X2 X0)) \end{aligned} \quad (16)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_msafree2 \\ & X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((\neg \\ & v11\_struct\_0 X1) \wedge ((v2\_msafree2 X1) \wedge (l1\_msualg\_1 X1)))) \Rightarrow (\forall X2. \\ & ((v1\_relat\_1 X2) \wedge (v1\_funct\_1 X2)) \Rightarrow (\forall X3.((v1\_relat\_1 \\ & X3) \wedge (v1\_funct\_1 X3)) \Rightarrow (\forall X4.((v4\_msualg\_1 X4 X0) \wedge ((v4\_msafree2 \\ & X4 X0) \wedge (l3\_msualg\_1 X4 X0)))) \Rightarrow (\forall X5.((v4\_msualg\_1 X5 X1) \wedge \\ & ((v4\_msafree2 X5 X1) \wedge (l3\_msualg\_1 X5 X1)))) \Rightarrow ((r5\_circtrm1 X0 X1 \\ & X2 X3 X4 X5) \Rightarrow (\forall X6.(m1\_subset\_1 X6 (k4\_card\_3 (u3\_msualg\_1 \\ & X0 X4))) \Rightarrow (\forall X7.(m1\_subset\_1 X7 (k4\_card\_3 (u3\_msualg\_1 \\ & X1 X5)))) \Rightarrow ((X6 = k3\_relat\_1 X2 X7) \Rightarrow ((v1\_circuit2 X6 X0 X4) \Leftrightarrow (v1\_circuit2 \\ & X7 X1 X5)))))))))) \end{aligned}$$