

# t13\_arytm\_1 (TM- NwV1k1c4crxSUR6WCKvkQeFHuKyKyvvc3)

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Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_arytm\_2 : \iota$  be given. Let  $r1\_arytm\_2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k7\_arytm\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_arytm\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k11\_arytm\_3 : \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0.(m1\_subset\_1 X0 k2\_arytm\_2) \Rightarrow (\forall X1.(m1\_subset\_1 \\ & X1 k2\_arytm\_2) \Rightarrow (\forall X2.(m1\_subset\_1 X2 k2\_arytm\_2) \Rightarrow (k7\_arytm\_2 \\ & X0 (k7\_arytm\_2 X1 X2) = k7\_arytm\_2 (k7\_arytm\_2 X0 X1) X2))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0.(m1\_subset\_1 X0 k2\_arytm\_2) \Rightarrow (\forall X1.(m1\_subset\_1 \\ & X1 k2\_arytm\_2) \Rightarrow (\forall X2.(m1\_subset\_1 X2 k2\_arytm\_2) \Rightarrow ((X0 = \\ & k7\_arytm\_2 X1 X2) \Rightarrow (r1\_arytm\_2 X2 X0)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((m1\_subset\_1 X0 k2\_arytm\_2) \wedge (m1\_subset\_1 \\ & X1 k2\_arytm\_2)) \Rightarrow (m1\_subset\_1 (k7\_arytm\_2 X0 X1) k2\_arytm\_2) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((m1\_subset\_1 X0 k2\_arytm\_2) \wedge (m1\_subset\_1 \\ & X1 k2\_arytm\_2)) \Rightarrow (m1\_subset\_1 (k1\_arytm\_1 X0 X1) k2\_arytm\_2) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.(m1\_subset\_1 X0 k2\_arytm\_2) \Rightarrow (\forall X1.(m1\_subset\_1 \\ & X1 k2\_arytm\_2) \Rightarrow (\forall X2.(m1\_subset\_1 X2 k2\_arytm\_2) \Rightarrow (((r1\_arytm\_2 \\ & X1 X0) \Rightarrow ((X2 = k1\_arytm\_1 X0 X1) \Leftrightarrow (k7\_arytm\_2 X2 X1 = X0))) \wedge ((\neg r1\_arytm\_2 \\ & X1 X0) \Rightarrow ((X2 = k1\_arytm\_1 X0 X1) \Leftrightarrow (X2 = k11\_arytm\_3)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((m1\_subset\_1 X0 k2\_arytm\_2) \wedge (m1\_subset\_1 \\ & X1 k2\_arytm\_2)) \Rightarrow (k7\_arytm\_2 X0 X1 = k7\_arytm\_2 X1 X0) \end{aligned} \quad (6)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.(m1\_subset\_1\ X0\ k2\_arytm\_2) \Rightarrow (\forall X1.(m1\_subset\_1 \\ & X1\ k2\_arytm\_2) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ k2\_arytm\_2) \Rightarrow ((r1\_arytm\_2 \\ & X0\ X1) \Rightarrow (k7\_arytm\_2\ X2\ (k1\_arytm\_1\ X1\ X0) = k1\_arytm\_1\ (k7\_arytm\_2 \\ & X2\ X1)\ X0)))) \end{aligned}$$