

## l40\_monoid\_0

(TMSaYDj5FGnb2ribqvYH8UUHQs1cJS6vTba)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l3\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v3\_group\_1 : \iota \Rightarrow o$  be given. Let  $v13\_monoid\_0 : \iota \Rightarrow o$  be given. Let  $v2\_group\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k6\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge (l3\_algstr\_0 X0)) \Rightarrow & ((\forall X1. \\ & (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 \\ & (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow \\ & (k6\_algstr\_0 X0 (k6\_algstr\_0 X0 X1 X2) X3 = k6\_algstr\_0 X0 X1 (k6\_algstr\_0 \\ & X0 X2 X3)))))) \wedge (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow ( \\ & \forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow ((\exists X3.(m1\_subset\_1 \\ & X3 (u1\_struct\_0 X0)) \wedge (k6\_algstr\_0 X0 X1 X3 = X2)) \wedge (\exists X3.( \\ & m1\_subset\_1 X3 (u1\_struct\_0 X0)) \wedge (k6\_algstr\_0 X0 X3 X1 = X2)))))) \Rightarrow \\ & ((v3\_group\_1 X0) \wedge (v2\_group\_1 X0)) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge (l3\_algstr\_0 X0)) \Rightarrow & ((v13\_monoid\_0 \\ & X0) \Leftrightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\ & (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\exists X3.(m1\_subset\_1 X3 \\ & (u1\_struct\_0 X0)) \wedge (\exists X4.(m1\_subset\_1 X4 (u1\_struct\_0 X0)) \wedge \\ & ((k6\_algstr\_0 X0 X1 X3 = X2) \wedge (k6\_algstr\_0 X0 X4 X1 = X2))))))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} \forall X0.(l3\_algstr\_0 X0) \Rightarrow & ((v3\_group\_1 X0) \Leftrightarrow (\forall X1.(m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (k6\_algstr\_0 \\ & X0 (k6\_algstr\_0 X0 X1 X2) X3 = k6\_algstr\_0 X0 X1 (k6\_algstr\_0 X0 X2 \\ & X3)))))) \end{aligned} \tag{3}$$

**Theorem 1**

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge (l3\_algstr\_0 X0)) \Rightarrow ((v3\_group\_1 X0) \wedge (v13\_monoid\_0 X0)) \Rightarrow (v2\_group\_1 X0)$$