t13_monoid_0 (TM-PLLKxnwT9UXAkvazcUrNPzuprut8KRECd)

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Let $v2\_struct\_0 : \iota \Rightarrow o$ be given. Let $l3\_algstr\_0 : \iota \Rightarrow o$ be given. Let $v16\_monoid\_0 : \iota \Rightarrow o$ 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. Let $l1\_struct\_0 : \iota \Rightarrow o$ be given. Let $v1\_xboole\_0 : \iota \Rightarrow o$ be given. Let $v1\_funct\_1 : \iota \Rightarrow o$ be given. Let $u2\_algstr\_0 : \iota \Rightarrow \iota$ be given. Let $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_zfmisc\_1 : \iota \Rightarrow \iota$ be given. Let $v8\_monoid\_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5\_binop\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge (l1\_struct\_0\ X0)) \Rightarrow (\neg v1\_xboole\_0\ (u1\_struct\_0\ X0)) \tag{1}$$

Assume the following.

$$\forall X0.(l3\_algstr\_0\ X0) \Rightarrow ((v1\_funct\_1\ (u2\_algstr\_0\ X0)) \wedge ((v1\_funct\_2\ (u2\_algstr\_0\ X0)\ (k2\_zfmisc\_1\ (u1\_struct\_0\ X0)\ (u1\_struct\_0\ X0))\ (u1\_struct\_0\ X0)) \wedge (m1\_subset\_1\ (u2\_algstr\_0\ X0)\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1\ (k2\_zfmisc\_1\ (u1\_struct\_0\ X0)\ (u1\_struct\_0\ X0))\ (u1\_struct\_0\ X0)))))) \tag{2}$$

Assume the following.

$$\forall X0.(l3\_algstr\_0\ X0) \Rightarrow (l1\_struct\_0\ X0) \tag{3}$$

Assume the following.

$$\forall X0.(\neg v1\_xboole\_0\ X0) \Rightarrow (\forall X1.((v1\_funct\_1\ X1) \wedge ((v1\_funct\_2\ X1\ (k2\_zfmisc\_1\ X0\ X0)\ X0) \wedge (m1\_subset\_1\ X1\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1\ (k2\_zfmisc\_1\ X0\ X0)\ X0))))) \Rightarrow ((v8\_monoid\_0\ X1\ X0) \Leftrightarrow (\forall X2.(m1\_subset\_1\ X2\ X0) \Rightarrow (\forall X3.(m1\_subset\_1\ X3\ X0) \Rightarrow (\forall X4.(m1\_subset\_1\ X4\ X0) \Rightarrow (((k5\_binop\_1\ X0\ X1\ X2\ X3 = k5\_binop\_1\ X0\ X1\ X2\ X4) \vee (k5\_binop\_1\ X0\ X1\ X3\ X2 = k5\_binop\_1\ X0\ X1\ X4\ X2)) \Rightarrow (X3 = X4))))))) \tag{4}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge(l3\_algstr\_0\ X0))\Rightarrow((v16\_monoid\_0\ X0)\Leftrightarrow(v8\_monoid\_0\ (u2\_algstr\_0\ X0)\ (u1\_struct\_0\ X0))) \tag{5}$$

Assume the following.

$$\forall X0.(l3\_algstr\_0\ X0)\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(k6\_algstr\_0\ X0\ X1\ X2 = k5\_binop\_1\ (u1\_struct\_0\ X0)\ (u2\_algstr\_0\ X0)\ X1\ X2))) \tag{6}$$

Theorem 1

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge(l3\_algstr\_0\ X0))\Rightarrow((v16\_monoid\_0\ X0)\Leftrightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\Rightarrow(((k6\_algstr\_0\ X0\ X1\ X2 = k6\_algstr\_0\ X0\ X1\ X3)\vee(k6\_algstr\_0\ X0\ X2\ X1 = k6\_algstr\_0\ X0\ X3\ X1))\Rightarrow(X2 = X3))))))$$