

t19_monoid_0

(TMG38QbVnbSusrwAsApeFiLXqcB8XnGHH6v)

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Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $l3_algstr_0 : \iota \Rightarrow o$ be given. Let $m1_monoid_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_group_1 : \iota \Rightarrow o$ be given. Let $v5_group_1 : \iota \Rightarrow o$ be given. Let $v3_group_1 : \iota \Rightarrow o$ be given. Let $v13_monoid_0 : \iota \Rightarrow o$ be given. Let $v17_monoid_0 : \iota \Rightarrow o$ be given. Let $v16_monoid_0 : \iota \Rightarrow o$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ 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 $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $g3_algstr_0 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u2_algstr_0 : \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $l4_algstr_0 : \iota \Rightarrow o$ be given. Let $l3_struct_0 : \iota \Rightarrow o$ be given. Let $v9_monoid_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v8_monoid_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v5_monoid_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2_binop_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_binop_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_setwiseo : \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1_funct_1 X1) \wedge ((v1_funct_2 X1 (k2_zfmisc_1 \\ & X0 X0) X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\ & X0 X0) X0)))) \Rightarrow (\forall X2. \forall X3. (g3_algstr_0 X0 X1 = g3_algstr_0 \\ & X2 X3) \Rightarrow ((X0 = X2) \wedge (X1 = X3)))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. (l3_algstr_0 X0) \Rightarrow ((v1_funct_1 (u2_algstr_0 X0)) \wedge \\ & ((v1_funct_2 (u2_algstr_0 X0) (k2_zfmisc_1 (u1_struct_0 X0) (\\ & u1_struct_0 X0)) (u1_struct_0 X0)) \wedge (m1_subset_1 (u2_algstr_0 \\ & X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (\\ & u1_struct_0 X0)) (u1_struct_0 X0)))))) \end{aligned} \tag{2}$$

Assume the following.

$$\forall X0. (l3_algstr_0 X0) \Rightarrow (\forall X1. (m1_monoid_0 X1 X0) \Rightarrow (l4_algstr_0 X1)) \tag{3}$$

Assume the following.

$$\forall X0. (l4_algstr_0 X0) \Rightarrow ((l3_struct_0 X0) \wedge (l3_algstr_0 X0)) \tag{4}$$

Assume the following.

$$\forall X0.(l3_algstr_0 X0) \Rightarrow (\forall X1.(l4_algstr_0 X1) \Rightarrow ((m1_monoid_0 X1 X0) \Leftrightarrow (g3_algstr_0 (u1_struct_0 X1) (u2_algstr_0 X1) = g3_algstr_0 (u1_struct_0 X0) (u2_algstr_0 X0)))) \quad (5)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l3_algstr_0 X0)) \Rightarrow ((v17_monoid_0 X0) \Leftrightarrow (v9_monoid_0 (u2_algstr_0 X0) (u1_struct_0 X0))) \quad (6)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l3_algstr_0 X0)) \Rightarrow ((v16_monoid_0 X0) \Leftrightarrow (v8_monoid_0 (u2_algstr_0 X0) (u1_struct_0 X0))) \quad (7)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l3_algstr_0 X0)) \Rightarrow ((v13_monoid_0 X0) \Leftrightarrow (v5_monoid_0 (u2_algstr_0 X0) (u1_struct_0 X0))) \quad (8)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l3_algstr_0 X0)) \Rightarrow ((v3_group_1 X0) \Leftrightarrow (v2_binop_1 (u2_algstr_0 X0) (u1_struct_0 X0))) \quad (9)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l3_algstr_0 X0)) \Rightarrow ((v5_group_1 X0) \Leftrightarrow (v1_binop_1 (u2_algstr_0 X0) (u1_struct_0 X0))) \quad (10)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l3_algstr_0 X0)) \Rightarrow ((v1_group_1 X0) \Leftrightarrow (v1_setwiseo (u2_algstr_0 X0) (u1_struct_0 X0))) \quad (11)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l3_algstr_0 X0)) \Rightarrow (\forall X1.(m1_monoid_0 X1 X0) \Rightarrow (\neg v2_struct_0 X1)) \quad (12)$$

Assume the following.

$$\forall X0.(l3_algstr_0 X0) \Rightarrow (((\neg v2_struct_0 X0) \wedge ((v3_group_1 X0) \wedge (v13_monoid_0 X0))) \Rightarrow ((\neg v2_struct_0 X0) \wedge ((v1_group_1 X0) \wedge (v16_monoid_0 X0)))) \quad (13)$$

Theorem 1

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l3_algstr_0 X0)) \Rightarrow (\forall X1.(m1_monoid_0 X1 X0) \Rightarrow (((v1_group_1 X0) \Rightarrow (v1_group_1 X1)) \wedge (((v5_group_1 X0) \Rightarrow (v5_group_1 X1)) \wedge (((v3_group_1 X0) \Rightarrow (v3_group_1 X1)) \wedge ((v13_monoid_0 X0) \Rightarrow (v13_monoid_0 X1)) \wedge (((v17_monoid_0 X0) \Rightarrow (v17_monoid_0 X1)) \wedge ((v16_monoid_0 X0) \Rightarrow (v16_monoid_0 X1))))))))$$