

t2_monoid_0
(TMcruSvFYer7rLamB2USxExqqe38EQwMjSN)

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Let $v1_xboole_0 : \iota \Rightarrow o$ 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 $v8_monoid_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v6_monoid_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v7_monoid_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. ((v1_funct_1 X1) \wedge (\\ & (v1_funct_2 X1 (k2_zfmisc_1 X0 X0) X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) X0)))))) \Rightarrow ((v8_monoid_0 X1 X0) \Leftrightarrow \\ & (\forall X2. (m1_subset_1 X2 X0) \Rightarrow (\forall X3. (m1_subset_1 X3 X0) \Rightarrow \\ & (\forall X4. (m1_subset_1 X4 X0) \Rightarrow ((k5_binop_1 X0 X1 X2 X3 = k5_binop_1 \\ & X0 X1 X2 X4) \vee (k5_binop_1 X0 X1 X3 X2 = k5_binop_1 X0 X1 X4 X2))) \Rightarrow (X3 = \\ & X4)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. ((v1_funct_1 X1) \wedge (\\ & (v1_funct_2 X1 (k2_zfmisc_1 X0 X0) X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) X0)))))) \Rightarrow ((v7_monoid_0 X1 X0) \Leftrightarrow \\ & (\forall X2. (m1_subset_1 X2 X0) \Rightarrow (\forall X3. (m1_subset_1 X3 X0) \Rightarrow \\ & (\forall X4. (m1_subset_1 X4 X0) \Rightarrow ((k5_binop_1 X0 X1 X3 X2 = k5_binop_1 \\ & X0 X1 X4 X2) \Rightarrow (X3 = X4)))))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. ((v1_funct_1 X1) \wedge (\\ & (v1_funct_2 X1 (k2_zfmisc_1 X0 X0) X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) X0)))))) \Rightarrow ((v6_monoid_0 X1 X0) \Leftrightarrow \\ & (\forall X2. (m1_subset_1 X2 X0) \Rightarrow (\forall X3. (m1_subset_1 X3 X0) \Rightarrow \\ & (\forall X4. (m1_subset_1 X4 X0) \Rightarrow ((k5_binop_1 X0 X1 X2 X3 = k5_binop_1 \\ & X0 X1 X2 X4) \Rightarrow (X3 = X4)))))) \end{aligned} \tag{3}$$

Theorem 1

$$\begin{aligned} \forall X0.(\neg v1_xboole_0 X0) \Rightarrow (\forall X1.((v1_funct_1 X1) \wedge \\ (v1_funct_2 X1 (k2_zfmisc_1 X0 X0) X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 \\ (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) X0)))))) \Rightarrow ((v8_monoid_0 X1 X0) \Leftrightarrow \\ ((v6_monoid_0 X1 X0) \wedge (v7_monoid_0 X1 X0))) \end{aligned}$$