

t50_monoid_1 (TMEzPmmd- WSm1WASmZincYFtR2aFoFA93m4f)

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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 $v2_binop_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k21_monoid_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_relset_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_relat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. (\neg v1_xboole_0 X3) \Rightarrow \\
& (\forall X4. ((v1_funct_1 X4) \wedge ((v1_funct_2 X4 (k2_zfmisc_1 X3 \\
& X3) X3) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\
& X3 X3) X3)))) \Rightarrow ((v2_binop_1 X4 X3) \Rightarrow (k7_relset_1 (k2_zfmisc_1 \\
& X3 X3) X3 X4 (k2_zfmisc_1 (k7_relset_1 (k2_zfmisc_1 X3 X3) X3 X4 (\\
& k2_zfmisc_1 X0 X1)) X2) = k7_relset_1 (k2_zfmisc_1 X3 X3) X3 X4 (k2_zfmisc_1 \\
& X0 (k7_relset_1 (k2_zfmisc_1 X3 X3) X3 X4 (k2_zfmisc_1 X1 X2)))))) \\
& \tag{1}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. (\neg v1_xboole_0 X1) \Rightarrow \\
& (\forall X2. (\neg v1_xboole_0 X2) \Rightarrow (\forall X3. ((v1_funct_1 X3) \wedge \\
& ((v1_funct_2 X3 (k2_zfmisc_1 X0 X1) X2) \wedge (m1_subset_1 X3 (k1_zfmisc_1 \\
& (k2_zfmisc_1 (k2_zfmisc_1 X0 X1) X2)))) \Rightarrow (\forall X4. (m1_subset_1 \\
& X4 (k1_zfmisc_1 X0)) \Rightarrow (\forall X5. (m1_subset_1 X5 (k1_zfmisc_1 \\
& X1)) \Rightarrow (k2_binop_1 (k1_zfmisc_1 X0) (k1_zfmisc_1 X1) (k1_zfmisc_1 \\
& X2) (k21_monoid_1 X0 X1 X2 X3) X4 X5 = k7_relset_1 (k2_zfmisc_1 X0 \\
& X1) X2 X3 (k2_zfmisc_1 X4 X5)))))) \\
& \tag{2}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. (m1_subset_1 X2 (\\
& k1_zfmisc_1 (k2_zfmisc_1 X0 X1))) \Rightarrow (k7_relset_1 X0 X1 X2 X3 = k7_relat_1 \\
& X2 X3) \\
& \tag{3}
\end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((v1_funct_1 X1)\wedge \\ & ((v1_funct_2 X1 (k2_zfmisc_1 X0 X0) X0)\wedge(m1_subset_1 X1 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) X0))))\wedge((m1_subset_1 X2 X0)\wedge \\ & (m1_subset_1 X3 X0)))\Rightarrow(k3_binop_1 X0 X1 X2 X3 = k1_binop_1 X1 X2 X3) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & ((\neg v1_xboole_0 X0)\wedge((\neg v1_xboole_0 X1)\wedge(((v1_funct_1 X3)\wedge(\\ & v1_funct_2 X3 (k2_zfmisc_1 X0 X1) X2)\wedge(m1_subset_1 X3 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X0 X1) X2))))\wedge((m1_subset_1 X4 X0)\wedge \\ & (m1_subset_1 X5 X1))))\Rightarrow(k2_binop_1 X0 X1 X2 X3 X4 X5 = k1_binop_1 \\ & X3 X4 X5) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0.\neg v1_xboole_0 (k1_zfmisc_1 X0) \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(m1_subset_1 X2 (\\ & k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))\Rightarrow(m1_subset_1 (k7_relset_1 \\ & X0 X1 X2 X3) (k1_zfmisc_1 X1)) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v1_xboole_0 X0)\wedge \\ & ((\neg v1_xboole_0 X1)\wedge((\neg v1_xboole_0 X2)\wedge((v1_funct_1 X3)\wedge((v1_funct_2 \\ & X3 (k2_zfmisc_1 X0 X1) X2)\wedge(m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 \\ & (k2_zfmisc_1 X0 X1) X2))))\wedge((v1_funct_1 (k21_monoid_1 X0 \\ & X1 X2 X3))\wedge((v1_funct_2 (k21_monoid_1 X0 X1 X2 X3) (k2_zfmisc_1 \\ & (k1_zfmisc_1 X0) (k1_zfmisc_1 X1)) (k1_zfmisc_1 X2))\wedge(m1_subset_1 \\ & (k21_monoid_1 X0 X1 X2 X3) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\ & (k1_zfmisc_1 X0) (k1_zfmisc_1 X1)) (k1_zfmisc_1 X2)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((v1_funct_1 X1)\wedge((v1_funct_2 X1 (k2_zfmisc_1 \\ & X0 X0) X0)\wedge(m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\ & X0 X0) X0))))\Rightarrow((v2_binop_1 X1 X0)\Leftrightarrow(\forall X2.(m1_subset_1 X2 \\ & X0)\Rightarrow(\forall X3.(m1_subset_1 X3 X0)\Rightarrow(\forall X4.(m1_subset_1 \\ & X4 X0)\Rightarrow(k3_binop_1 X0 X1 X2 (k3_binop_1 X0 X1 X3 X4) = k3_binop_1 X0 \\ & X1 (k3_binop_1 X0 X1 X2 X3) X4)))) \end{aligned} \quad (9)$$

Theorem 1

$$\begin{aligned} & \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. ((v1_funct_1 X1) \wedge \\ & (v1_funct_2 X1 (k2_zfmisc_1 X0 X0) X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) X0)))) \Rightarrow ((v2_binop_1 X1 X0) \Rightarrow \\ & (v2_binop_1 (k21_monoid_1 X0 X0 X0 X1) (k1_zfmisc_1 X0)))) \end{aligned}$$