

t5_monoid_1

(TMUxScjnFhE5LVwxELcpRDb3HfjFoGacnSG)

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Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ 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 $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $r3_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k6_monoid_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_monoid_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_setwiseo : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k9_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k10_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Assume the following.

$$\forall X0. \forall X1. \neg(v1_xboole_0 X0) \wedge ((X0 \neq X1) \wedge (v1_xboole_0 X1)) \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. (\neg v1_xboole_0 X1) \Rightarrow \\ & (\forall X2. ((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X0 X1) \wedge (m1_subset_1 \\ & X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))))) \Rightarrow (\forall X3. ((v1_funct_1 \\ & X3) \wedge ((v1_funct_2 X3 (k2_zfmisc_1 X1 X1) X1) \wedge (m1_subset_1 X3 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1)))))) \Rightarrow ((v1_setwiseo X3 X1) \Rightarrow \\ & (r2_funct_2 X0 X1 (k9_funcop_1 X1 X0 X3 X2 (k4_binop_1 X1 X3) X2)))))) \quad (2) \end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. (\neg v1_xboole_0 X1) \Rightarrow \\ & (\forall X2. ((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X0 X1) \wedge (m1_subset_1 \\ & X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))))) \Rightarrow (\forall X3. ((v1_funct_1 \\ & X3) \wedge ((v1_funct_2 X3 (k2_zfmisc_1 X1 X1) X1) \wedge (m1_subset_1 X3 (k1_zfmisc_1 \\ & (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1)))))) \Rightarrow ((v1_setwiseo X3 X1) \Rightarrow \\ & (r2_funct_2 X0 X1 (k10_funcop_1 X1 X0 X3 (k4_binop_1 X1 X3) X2) X2)))))) \quad (3) \end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((v1_funct_1 X2) \wedge \\ & ((v1_funct_2 X2 X0 X1) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\ & X0 X1)))))) \wedge ((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X0 X1) \wedge (m1_subset_1 \\ & X3 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))))) \Rightarrow ((r2_funct_2 X0 X1 X2 \\ & X3) \Leftrightarrow (X2 = X3)) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. ((\neg v1_xboole_0 \\ & X0) \wedge (((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (k2_zfmisc_1 X0 X0) X0) \wedge \\ & (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) \\ & X0)))))) \wedge ((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 X0) \wedge (m1_subset_1 \\ & X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge (m1_subset_1 X4 X0))) \Rightarrow \\ & (k9_funcop_1 X0 X1 X2 X3 X4 = k4_funcop_1 X2 X3 X4) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & \forall X6. ((\neg v1_xboole_0 X1) \wedge ((\neg v1_xboole_0 X2) \wedge ((\neg v1_xboole_0 \\ & X3) \wedge (((v1_funct_1 X4) \wedge ((v1_funct_2 X4 (k2_zfmisc_1 X1 X2) X3) \wedge \\ & (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X2) \\ & X3)))))) \wedge ((v1_funct_1 X5) \wedge ((v1_funct_2 X5 X0 X1) \wedge (m1_subset_1 \\ & X5 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))))) \wedge (m1_subset_1 X6 X2)))))) \Rightarrow \\ & (k7_monoid_1 X0 X1 X2 X3 X4 X5 X6 = k4_funcop_1 X4 X5 X6) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & \forall X6. ((\neg v1_xboole_0 X1) \wedge ((\neg v1_xboole_0 X2) \wedge ((\neg v1_xboole_0 \\ & X3) \wedge (((v1_funct_1 X4) \wedge ((v1_funct_2 X4 (k2_zfmisc_1 X1 X2) X3) \wedge \\ & (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X2) \\ & X3)))))) \wedge ((m1_subset_1 X5 X1) \wedge ((v1_funct_1 X6) \wedge ((v1_funct_2 \\ & X6 X0 X2) \wedge (m1_subset_1 X6 (k1_zfmisc_1 (k2_zfmisc_1 X0 X2)))))))))) \Rightarrow \\ & (k6_monoid_1 X0 X1 X2 X3 X4 X5 X6 = k5_funcop_1 X4 X5 X6) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. ((\neg v1_xboole_0 \\ & X0) \wedge (((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (k2_zfmisc_1 X0 X0) X0) \wedge \\ & (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) \\ & X0)))))) \wedge ((m1_subset_1 X3 X0) \wedge ((v1_funct_1 X4) \wedge ((v1_funct_2 \\ & X4 X1 X0) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))))) \Rightarrow \\ & (k10_funcop_1 X0 X1 X2 X3 X4 = k5_funcop_1 X2 X3 X4) \end{aligned} \quad (8)$$

Assume the following.

$$v1_xboole_0 \quad k1_xboole_0 \quad (9)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.((\neg v1_xboole_0 \\
& X0)\wedge(((v1_funct_1 X2)\wedge((v1_funct_2 X2 (k2_zfmisc_1 X0 X0) X0)\wedge \\
& (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) \\
& X0))))\wedge(((v1_funct_1 X3)\wedge((v1_funct_2 X3 X1 X0)\wedge(m1_subset_1 \\
& X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0))))\wedge(m1_subset_1 X4 X0))))\Rightarrow \\
& ((v1_funct_1 (k9_funcop_1 X0 X1 X2 X3 X4)\wedge((v1_funct_2 (k9_funcop_1 \\
& X0 X1 X2 X3 X4) X1 X0)\wedge(m1_subset_1 (k9_funcop_1 X0 X1 X2 X3 X4) (k1_zfmisc_1 \\
& (k2_zfmisc_1 X1 X0))))))
\end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.((\neg v1_xboole_0 \\
& X0)\wedge(((v1_funct_1 X2)\wedge((v1_funct_2 X2 (k2_zfmisc_1 X0 X0) X0)\wedge \\
& (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) \\
& X0))))\wedge((m1_subset_1 X3 X0)\wedge((v1_funct_1 X4)\wedge((v1_funct_2 \\
& X4 X1 X0)\wedge(m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0))))))\Rightarrow \\
& ((v1_funct_1 (k10_funcop_1 X0 X1 X2 X3 X4)\wedge((v1_funct_2 (k10_funcop_1 \\
& X0 X1 X2 X3 X4) X1 X0)\wedge(m1_subset_1 (k10_funcop_1 X0 X1 X2 X3 X4) (k1_zfmisc_1 \\
& (k2_zfmisc_1 X1 X0))))))
\end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.((v1_funct_1 X1)\wedge((v1_funct_2 X1 (k2_zfmisc_1 \\
& X0 X0) X0)\wedge(m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\
& X0 X0) X0))))\Rightarrow((\exists X2.(m1_subset_1 X2 X0)\wedge(r3_binop_1 X0 \\
& X2 X1))\Rightarrow(\forall X2.(m1_subset_1 X2 X0)\Rightarrow((X2 = k4_binop_1 X0 X1)\Leftrightarrow \\
& (r3_binop_1 X0 X2 X1))))
\end{aligned} \tag{12}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(\neg v1_xboole_0 X0)\Rightarrow(\forall X1.((v1_funct_1 X1)\wedge(\\
& (v1_funct_2 X1 (k2_zfmisc_1 X0 X0) X0)\wedge(m1_subset_1 X1 (k1_zfmisc_1 \\
& (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) X0))))\Rightarrow((v1_setwiseo X1 X0)\Leftrightarrow \\
& (\exists X2.(m1_subset_1 X2 X0)\wedge(r3_binop_1 X0 X2 X1))))
\end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(v1_xboole_0 X0)\Rightarrow(\forall X2.(m1_subset_1 \\
& X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1))\Rightarrow(v1_xboole_0 X2))
\end{aligned} \tag{14}$$

Theorem 1

$$\begin{aligned} & \forall X0. \forall X1. (\neg v1_xboole_0 X1) \Rightarrow (\forall X2. (m1_subset_1 \\ & X2 X1) \Rightarrow (\forall X3. ((v1_funct_1 X3) \wedge ((v1_funct_2 X3 (k2_zfmisc_1 \\ & X1 X1) X1) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\ & X1 X1) X1)))))) \Rightarrow (\forall X4. ((v1_funct_1 X4) \wedge ((v1_funct_2 X4 X0 \\ & X1) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))))) \Rightarrow ((r3_binop_1 \\ & X1 X2 X3) \Rightarrow ((r2_funct_2 X0 X1 (k6_monoid_1 X0 X1 X1 X1 X3 X2 X4) X4) \wedge \\ & (r2_funct_2 X0 X1 (k7_monoid_1 X0 X1 X1 X1 X3 X4 X2) X4)))))) \end{aligned}$$