

# t24\_monoid\_1 (TM- cBfZCiNqH1ShWNfxfdeoUGCTuxhTfwNLx)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l3\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $m2\_monoid\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k9\_monoid\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k9\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_algstr\_0 : \iota \Rightarrow \iota$  be given. Let  $k8\_monoid\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. 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  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $r1\_relset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. ((\neg v2\_struct\_0 X1) \wedge (l3\_algstr\_0 X1)) \Rightarrow \\
& ((u1\_struct\_0 (k9\_monoid\_1 X1 X0) = k9\_funct\_2 X0 (u1\_struct\_0 \\
& X1)) \wedge (r1\_funct\_2 (k2\_zfmisc\_1 (u1\_struct\_0 (k9\_monoid\_1 X1 X0)) \\
& (u1\_struct\_0 (k9\_monoid\_1 X1 X0))) (u1\_struct\_0 (k9\_monoid\_1 \\
& X1 X0)) (k2\_zfmisc\_1 (k9\_funct\_2 X0 (u1\_struct\_0 X1)) (k9\_funct\_2 \\
& X0 (u1\_struct\_0 X1))) (k9\_funct\_2 X0 (u1\_struct\_0 X1)) (u2\_algstr\_0 \\
& (k9\_monoid\_1 X1 X0)) (k8\_monoid\_1 (u1\_struct\_0 X1) (u1\_struct\_0 \\
& X1) (u1\_struct\_0 X1) (u2\_algstr\_0 X1) X0)))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (\neg v1\_xboole\_0 X1) \Rightarrow (\forall X2. (\neg v1\_xboole\_0 \\
& X2) \Rightarrow (\forall X3. (\neg v1\_xboole\_0 X3) \Rightarrow (\forall X4. (\neg v1\_xboole\_0 \\
& X4) \Rightarrow (\forall X5. (\neg v1\_xboole\_0 X5) \Rightarrow (\forall X6. (\neg v1\_xboole\_0 \\
& X6) \Rightarrow (\forall X7. ((v1\_funct\_1 X7) \wedge ((v1\_funct\_2 X7 (k2\_zfmisc\_1 \\
& X1 X2) X3) \wedge (m1\_subset\_1 X7 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 \\
& X1 X2) X3)))) \Rightarrow (\forall X8. ((v1\_funct\_1 X8) \wedge ((v1\_funct\_2 X8 ( \\
& k2\_zfmisc\_1 X4 X5) X6) \wedge (m1\_subset\_1 X8 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\
& (k2\_zfmisc\_1 X4 X5) X6)))) \Rightarrow ((r1\_relset\_1 (k2\_zfmisc\_1 X1 X2) \\
& X3 X7 X8) \Rightarrow (r1\_relset\_1 (k2\_zfmisc\_1 (k9\_funct\_2 X0 X1) (k9\_funct\_2 \\
& X0 X2)) (k9\_funct\_2 X0 X3) (k8\_monoid\_1 X1 X2 X3 X7 X0) (k8\_monoid\_1 \\
& X4 X5 X6 X8 X0))))))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.(m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1)))\Rightarrow((r1\_relset\_1 X0 X1 X2 X3)\Leftrightarrow(r1\_tarski X2 X3)) \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5.((\neg v1\_xboole\_0 X1)\wedge(\neg v1\_xboole\_0 X3)\wedge((v1\_funct\_1 X4)\wedge((v1\_funct\_2 X4 X0 X1)\wedge(m1\_subset\_1 X4 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1))))))\wedge((v1\_funct\_1 X5)\wedge((v1\_funct\_2 X5 X2 X3)\wedge(m1\_subset\_1 X5 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X2 X3))))))\Rightarrow((r1\_funct\_2 X0 X1 X2 X3 X4 X5)\Leftrightarrow(X4 = X5)) \quad (4)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_struct\_0 X0))\Rightarrow(\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v2\_struct\_0 X0)\wedge(l3\_algstr\_0 X0))\Rightarrow(\neg v2\_struct\_0 (k9\_monoid\_1 X0 X1)) \quad (6)$$

Assume the following.

$$\forall X0.(l3\_algstr\_0 X0)\Rightarrow((v1\_funct\_1 (u2\_algstr\_0 X0))\wedge((v1\_funct\_2 (u2\_algstr\_0 X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) (u1\_struct\_0 X0))\wedge(m1\_subset\_1 (u2\_algstr\_0 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) (u1\_struct\_0 X0)))))) \quad (7)$$

Assume the following.

$$\forall X0.(l3\_algstr\_0 X0)\Rightarrow(\forall X1.(m2\_monoid\_0 X1 X0)\Rightarrow(l3\_algstr\_0 X1)) \quad (8)$$

Assume the following.

$$\forall X0.(l3\_algstr\_0 X0)\Rightarrow(l1\_struct\_0 X0) \quad (9)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v2\_struct\_0 X0)\wedge(l3\_algstr\_0 X0))\Rightarrow(l3\_algstr\_0 (k9\_monoid\_1 X0 X1)) \quad (10)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.((\neg v1\_xboole\_0 \\
& X0)\wedge((\neg v1\_xboole\_0 X1)\wedge((\neg v1\_xboole\_0 X2)\wedge((v1\_funct\_1 X3)\wedge \\
& ((v1\_funct\_2 X3 (k2\_zfmisc\_1 X0 X1) X2)\wedge(m1\_subset\_1 X3 (k1\_zfmisc\_1 \\
& (k2\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1) X2))))))\Rightarrow((v1\_funct\_1 (k8\_monoid\_1 \\
& X0 X1 X2 X3 X4)\wedge((v1\_funct\_2 (k8\_monoid\_1 X0 X1 X2 X3 X4) (k2\_zfmisc\_1 \\
& (k9\_funct\_2 X4 X0) (k9\_funct\_2 X4 X1)) (k9\_funct\_2 X4 X2))\wedge(m1\_subset\_1 \\
& (k8\_monoid\_1 X0 X1 X2 X3 X4) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 \\
& (k9\_funct\_2 X4 X0) (k9\_funct\_2 X4 X1)) (k9\_funct\_2 X4 X2)))))) \\
& \hspace{15em} (11)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l3\_algstr\_0 X0)\Rightarrow(\forall X1.(l3\_algstr\_0 X1)\Rightarrow(( \\
& m2\_monoid\_0 X1 X0)\Leftrightarrow(r1\_tarSKI (u2\_algstr\_0 X1) (u2\_algstr\_0 X0)))) \\
& \hspace{15em} (12)
\end{aligned}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.\forall X1.((\neg v2\_struct\_0 X1)\wedge(l3\_algstr\_0 X1))\Rightarrow \\
& (\forall X2.((\neg v2\_struct\_0 X2)\wedge(m2\_monoid\_0 X2 X1))\Rightarrow(m2\_monoid\_0 \\
& (k9\_monoid\_1 X2 X0) (k9\_monoid\_1 X1 X0)))
\end{aligned}$$