

# t19\_lattice2 (TMcK- mJBce333nUEkSD37imureinMWhRYE9k)

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Let  $v2\_struct.0 : \iota \Rightarrow o$  be given. Let  $v10\_lattices : \iota \Rightarrow o$  be given. Let  $l3\_lattices : \iota \Rightarrow o$  be given. Let  $v1\_setwiseo : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_lattices : \iota \Rightarrow \iota$  be given. Let  $u1\_struct.0 : \iota \Rightarrow \iota$  be given. Let  $k6\_lattices : \iota \Rightarrow \iota$  be given. Let  $k4\_binop.1 : \iota \Rightarrow \iota \Rightarrow \iota$  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  $v1\_binop.1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r3\_binop.1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k3\_binop.1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_binop.1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_binop.1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v6\_lattices : \iota \Rightarrow o$  be given. Let  $l1\_lattices : \iota \Rightarrow o$  be given. Let  $v3\_binop.1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_struct.0 : \iota \Rightarrow o$  be given. Let  $v1\_xboole.0 : \iota \Rightarrow o$  be given. Let  $l2\_lattices : \iota \Rightarrow o$  be given. Let  $v4\_lattices : \iota \Rightarrow o$  be given. Let  $v5\_lattices : \iota \Rightarrow o$  be given. Let  $v7\_lattices : \iota \Rightarrow o$  be given. Let  $v8\_lattices : \iota \Rightarrow o$  be given. Let  $v9\_lattices : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1\_funct.1 X1) \wedge ((v1\_funct.2 X1 (k2\_zfmisc.1 \\ & X0 X0) X0) \wedge (m1\_subset.1 X1 (k1\_zfmisc.1 (k2\_zfmisc.1 (k2\_zfmisc.1 \\ & X0 X0) X0)))) \Rightarrow (\forall X2. (m1\_subset.1 X2 X0) \Rightarrow ((v1\_binop.1 X1 \\ & X0) \Rightarrow ((r3\_binop.1 X0 X2 X1) \Leftrightarrow (\forall X3. (m1\_subset.1 X3 X0) \Rightarrow (k3\_binop.1 \\ & X0 X1 X2 X3 = X3)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct.0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\ & X0))) \Rightarrow (\forall X1. (m1\_subset.1 X1 (u1\_struct.0 X0)) \Rightarrow ((\forall X2. \\ & (m1\_subset.1 X2 (u1\_struct.0 X0)) \Rightarrow (k5\_binop.1 (u1\_struct.0 X0) \\ & (u1\_lattices X0) X1 X2 = X2)) \Rightarrow (X1 = k6\_lattices X0))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((v1\_funct.1 X1) \wedge \\ & ((v1\_funct.2 X1 (k2\_zfmisc.1 X0 X0) X0) \wedge (m1\_subset.1 X1 (k1\_zfmisc.1 \\ & (k2\_zfmisc.1 (k2\_zfmisc.1 X0 X0) X0)))) \wedge ((m1\_subset.1 X2 X0) \wedge \\ & (m1\_subset.1 X3 X0))) \Rightarrow (k5\_binop.1 X0 X1 X2 X3 = k1\_binop.1 X1 X2 X3)) \end{aligned} \tag{3}$$

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.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0)\wedge((v6\_lattices X0)\wedge(l1\_lattices \\ & X0)))\Rightarrow((v1\_funct\_1 (u1\_lattices X0))\wedge((v1\_funct\_2 (u1\_lattices \\ & X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) (u1\_struct\_0 \\ & X0))\wedge(v1\_binop\_1 (u1\_lattices X0) (u1\_struct\_0 X0)))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0)\wedge((v10\_lattices X0)\wedge(l3\_lattices \\ & X0)))\Rightarrow((v1\_funct\_1 (u1\_lattices X0))\wedge((v1\_funct\_2 (u1\_lattices \\ & X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) (u1\_struct\_0 \\ & X0))\wedge(v3\_binop\_1 (u1\_lattices X0) (u1\_struct\_0 X0)))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_struct\_0 X0))\Rightarrow(\neg v1\_xboole\_0 \\ & (u1\_struct\_0 X0)) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_lattices X0)\Rightarrow((v1\_funct\_1 (u1\_lattices X0))\wedge \\ & ((v1\_funct\_2 (u1\_lattices X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0))\wedge(m1\_subset\_1 (u1\_lattices \\ & X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\forall X0.(l3\_lattices X0)\Rightarrow((l1\_lattices X0)\wedge(l2\_lattices X0)) \quad (9)$$

Assume the following.

$$\forall X0.(l2\_lattices X0)\Rightarrow(l1\_struct\_0 X0) \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((v1\_funct\_1 X1)\wedge((v1\_funct\_2 X1 (k2\_zfmisc\_1 \\ & X0 X0) X0)\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 \\ & X0 X0) X0))))\Rightarrow(m1\_subset\_1 (k4\_binop\_1 X0 X1) X0) \end{aligned} \quad (11)$$

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.

$$\begin{aligned}
& \forall X0. (l3\_lattices X0) \Rightarrow (((\neg v2\_struct\_0 X0) \wedge (v10\_lattices \\
& X0)) \Rightarrow ((\neg v2\_struct\_0 X0) \wedge ((v4\_lattices X0) \wedge ((v5\_lattices X0) \wedge \\
& ((v6\_lattices X0) \wedge ((v7\_lattices X0) \wedge ((v8\_lattices X0) \wedge (v9\_lattices \\
& X0))))))))
\end{aligned} \tag{14}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\
& X0))) \Rightarrow ((v1\_setwiseo (u1\_lattices X0) (u1\_struct\_0 X0)) \Rightarrow (k6\_lattices \\
& X0 = k4\_binop\_1 (u1\_struct\_0 X0) (u1\_lattices X0)))
\end{aligned}$$