

## t24\_lattice4

(TMXdkSiaSyPY9yuhM3inaJW9gsoCnaaTRHr)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v10\_lattices : \iota \Rightarrow o$  be given. Let  $v14\_lattices : \iota \Rightarrow o$  be given. Let  $l3\_lattices : \iota \Rightarrow o$  be given. Let  $v20\_lattices : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v21\_lattices : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k6\_lattices : \iota \Rightarrow \iota$  be given. Let  $k5\_finsub\_1 : \iota \Rightarrow \iota$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_lattice4 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k5\_setwiseo : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_setwiseo : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_lattices : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_xboole\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_setwiseo : \iota \Rightarrow \iota$  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  $k3\_lattice2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_lattices : \iota \Rightarrow o$  be given. Let  $l2\_lattices : \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $k3\_struct\_0 : \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0. \forall X1. \forall X2. \neg (X0 \in X1) \wedge ((m1\_subset\_1 X1 (k1\_zfmisc\_1 X2)) \wedge (v1\_xboole\_0 X2)) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. ((X0 \in X1) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 X2))) \Rightarrow (m1\_subset\_1 X0 X2) \quad (2)$$

Assume the following.

$$\forall X0. \forall X1. (m1\_subset\_1 X0 (k1\_zfmisc\_1 X1)) \Leftrightarrow (r1\_tarski X0 X1) \quad (3)$$

Assume the following.

$$\forall X0. \forall X1. (r1\_tarski (k1\_tarski X0) X1) \Leftrightarrow (X0 \in X1) \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge ((v14\_lattices \\ X0) \wedge (l3\_lattices X0)))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k5\_finsub\_1 \\ (u1\_struct\_0 X0))) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ X0)) \Rightarrow (k2\_lattice4 X0 (k5\_setwiseo (u1\_struct\_0 X0) X1 (k2\_setwiseo \\ (u1\_struct\_0 X0) X2)) = k4\_lattices X0 (k2\_lattice4 X0 X1) X2))) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(r1\_tarski (k2\_xboole\_0 X0 X1) X2) \Rightarrow (r1\_tarski X0 X2) \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0 : \iota \Rightarrow o.\forall X1.((X0 (k1\_setwiseo X1)) \wedge (\forall X2. \\ (m1\_subset\_1 X2 (k5\_finsub\_1 X1)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 \\ X1) \Rightarrow ((X0 X2) \Rightarrow (X0 (k2\_xboole\_0 X2 (k1\_tarski X3)))))) \Rightarrow (\forall X2. \\ (m1\_subset\_1 X2 (k5\_finsub\_1 X1)) \Rightarrow (X0 X2)) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((m1\_subset\_1 X1 (k5\_finsub\_1 X0)) \wedge (m1\_subset\_1 X2 (k5\_finsub\_1 X0))) \Rightarrow (k5\_setwiseo X0 X1 X2 = k2\_xboole\_0 X1 X2) \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.((\neg v1\_xboole\_0 X0) \wedge (m1\_subset\_1 X1 X0)) \Rightarrow (k2\_setwiseo X0 X1 = k1\_tarski X1) \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge ((v14\_lattices \\ X0) \wedge (l3\_lattices X0)))) \Rightarrow (\forall X1.((v1\_funct\_1 X1) \wedge ((v1\_funct\_2 \\ X1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 \\ (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)))))) \Rightarrow (k3\_lattice2 \\ (u1\_struct\_0 X0) X0 (k1\_setwiseo (u1\_struct\_0 X0) X1 = k6\_lattices \\ X0)) \end{aligned} \quad (10)$$

Assume the following.

$$\forall X0.(l3\_lattices X0) \Rightarrow ((l1\_lattices X0) \wedge (l2\_lattices X0)) \quad (11)$$

Assume the following.

$$\forall X0.(l1\_lattices X0) \Rightarrow (l1\_struct\_0 X0) \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0. (& l1\_struct\_0 X0) \Rightarrow ((v1\_funct\_1 (k3\_struct\_0 X0)) \wedge \\ & ((v1\_funct\_2 (k3\_struct\_0 X0) (u1\_struct\_0 X0) (u1\_struct\_0 X0)) \wedge \\ & (m1\_subset\_1 (k3\_struct\_0 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 \\ & X0) (u1\_struct\_0 X0)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. (& (\neg v1\_xboole\_0 X0) \wedge (m1\_subset\_1 X1 X0)) \Rightarrow \\ & (m1\_subset\_1 (k2\_setwiseo X0 X1) (k5\_finsub\_1 X0)) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0. (v1\_xboole\_0 (k1\_setwiseo X0)) \wedge (m1\_subset\_1 (k1\_setwiseo X0) (k5\_finsub\_1 X0)) \quad (15)$$

Assume the following.

$$\begin{aligned} \forall X0. (& (\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\ & X0))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (k5\_finsub\_1 (u1\_struct\_0 \\ & X0))) \Rightarrow (k2\_lattice4 X0 X1 = k3\_lattice2 (u1\_struct\_0 X0) X0 X1 (k3\_struct\_0 \\ & X0))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0. (& (\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\ & X0))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 \\ & X0))) \Rightarrow ((v20\_lattices X1 X0) \Leftrightarrow (\forall X2. (m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \Rightarrow (\forall X3. (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (((X2 \in X1) \wedge \\ & (X3 \in X1)) \Rightarrow (k4\_lattices X0 X2 X3 \in X1)))))) \end{aligned} \quad (17)$$

Assume the following.

$$\forall X0. \forall X1. k2\_xboole\_0 X0 X1 = k2\_xboole\_0 X1 X0 \quad (18)$$

**Theorem 1**

$$\begin{aligned} \forall X0. (& (\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge ((v14\_lattices \\ & X0) \wedge (l3\_lattices X0)))) \Rightarrow (\forall X1. ((v20\_lattices X1 X0) \wedge ( \\ & (v21\_lattices X1 X0) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 \\ & X0)))) \Rightarrow ((k6\_lattices X0 \in X1) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (k5\_finsub\_1 \\ & (u1\_struct\_0 X0)) \Rightarrow ((r1\_tarski X2 X1) \Rightarrow (k2\_lattice4 X0 X2 \in X1)))))) \end{aligned}$$