

t23_lattice4

(TMK8DoQFNgoubJEQGDikQG9koNrtquXdN8X)

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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 $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_finsub_1 : \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k4_lattices : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_lattice4 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_setwiseo : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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 $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $v3_binop_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_binop_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2_binop_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_setwiseo : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k7_setwiseo : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v6_lattices : \iota \Rightarrow o$ be given. Let $l1_lattices : \iota \Rightarrow o$ be given. Let $k2_lattices : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v7_lattices : \iota \Rightarrow o$ be given. Let $u1_lattices : \iota \Rightarrow \iota$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l2_lattices : \iota \Rightarrow o$ be given. Let $k3_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_lattice2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_partfun1 : \iota \Rightarrow \iota$ be given. Let $v4_lattices : \iota \Rightarrow o$ be given. Let $v5_lattices : \iota \Rightarrow o$ be given. Let $v8_lattices : \iota \Rightarrow o$ be given. Let $v9_lattices : \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. (\neg v1_xboole_0 X1) \Rightarrow \\
 & (\forall X2. ((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (k2_zfmisc_1 X0 \\
 & X0) X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\
 & X0 X0) X0)))))) \Rightarrow (\forall X3. ((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 \\
 & X0) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \Rightarrow (((\\
 & v3_binop_1 X2 X0) \wedge ((v1_binop_1 X2 X0) \wedge ((v2_binop_1 X2 X0) \wedge (v1_setwiseo \\
 & X2 X0)))) \Rightarrow (\forall X4. (m1_subset_1 X4 (k5_finsub_1 X1)) \Rightarrow (\forall X5. \\
 & (m1_subset_1 X5 (k5_finsub_1 X1)) \Rightarrow (k7_setwiseo X1 X0 X2 (k5_setwiseo \\
 & X1 X4 X5) X3 = k5_binop_1 X0 X2 (k7_setwiseo X1 X0 X2 X4 X3) (k7_setwiseo \\
 & X1 X0 X2 X5 X3)))))))))
 \end{aligned}
 \tag{1}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge(v6_lattices X0)\wedge(l1_lattices X0)))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X2 (u1_struct_0 X0))))\Rightarrow(k4_lattices X0 X1 X2 = k2_lattices X0 X1 X2) \quad (2)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(v7_lattices X0)\wedge(l1_lattices X0))\Rightarrow((v1_funct_1 (u1_lattices X0))\wedge((v1_funct_2 (u1_lattices X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 X0))\wedge(v2_binop_1 (u1_lattices X0) (u1_struct_0 X0)))) \quad (3)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(v6_lattices X0)\wedge(l1_lattices X0))\Rightarrow((v1_funct_1 (u1_lattices X0))\wedge((v1_funct_2 (u1_lattices X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 X0))\wedge(v1_binop_1 (u1_lattices X0) (u1_struct_0 X0)))) \quad (4)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(v10_lattices X0)\wedge(l3_lattices X0))\Rightarrow((v1_funct_1 (u1_lattices X0))\wedge((v1_funct_2 (u1_lattices X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 X0))\wedge(v3_binop_1 (u1_lattices X0) (u1_struct_0 X0)))) \quad (5)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(l1_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u1_struct_0 X0)) \quad (6)$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(v10_lattices X0)\wedge((v14_lattices X0)\wedge(l3_lattices X0)))\Rightarrow((v1_funct_1 (u1_lattices X0))\wedge((v1_funct_2 (u1_lattices X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 X0))\wedge(v1_setwiseo (u1_lattices X0) (u1_struct_0 X0)))) \quad (7)$$

Assume the following.

$$\forall X0.(l1_lattices X0)\Rightarrow((v1_funct_1 (u1_lattices X0))\wedge((v1_funct_2 (u1_lattices X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 X0))\wedge(m1_subset_1 (u1_lattices X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 X0)))))) \quad (8)$$

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.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.((m1_subset_1\ X1\ (k5_finsub_1 \\ X0))\wedge(m1_subset_1\ X2\ (k5_finsub_1\ X0)))\Rightarrow(m1_subset_1\ (k5_setwiseo \\ X0\ X1\ X2)\ (k5_finsub_1\ X0)) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1_struct_0\ X0)\Rightarrow((v1_funct_1\ (k3_struct_0\ X0))\wedge \\ ((v1_funct_2\ (k3_struct_0\ X0)\ (u1_struct_0\ X0)\ (u1_struct_0\ X0))\wedge \\ (m1_subset_1\ (k3_struct_0\ X0)\ (k1_zfmisc_1\ (k2_zfmisc_1\ (u1_struct_0 \\ X0)\ (u1_struct_0\ X0)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((\neg v2_struct_0\ X0)\wedge((v10_lattices\ X0)\wedge \\ (l3_lattices\ X0)))\wedge(m1_subset_1\ X1\ (k5_finsub_1\ (u1_struct_0 \\ X0))))\Rightarrow(m1_subset_1\ (k2_lattice4\ X0\ X1)\ (u1_struct_0\ X0)) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0\ X0)\wedge((v10_lattices\ X0)\wedge(l3_lattices \\ X0)))\Rightarrow(\forall X1.(m1_subset_1\ X1\ (k5_finsub_1\ (u1_struct_0 \\ X0)))\Rightarrow(k2_lattice4\ X0\ X1 = k3_lattice2\ (u1_struct_0\ X0)\ X0\ X1\ (k3_struct_0 \\ X0))) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0.(l1_struct_0\ X0)\Rightarrow(k3_struct_0\ X0 = k6_partfun1\ (u1_struct_0\ X0)) \quad (15)$$

Assume the following.

$$\begin{aligned} \forall X0.(\neg v1_xboole_0\ X0)\Rightarrow(\forall X1.((\neg v2_struct_0\ X1)\wedge \\ ((v10_lattices\ X1)\wedge(l3_lattices\ X1)))\Rightarrow(\forall X2.(m1_subset_1 \\ X2\ (k5_finsub_1\ X0))\Rightarrow(\forall X3.((v1_funct_1\ X3)\wedge((v1_funct_2 \\ X3\ X0\ (u1_struct_0\ X1))\wedge(m1_subset_1\ X3\ (k1_zfmisc_1\ (k2_zfmisc_1 \\ X0\ (u1_struct_0\ X1))))))\Rightarrow(k3_lattice2\ X0\ X1\ X2\ X3 = k7_setwiseo \\ X0\ (u1_struct_0\ X1)\ (u1_lattices\ X1)\ X2\ X3)))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge (l1_lattices X0)) \Rightarrow (\forall X1. \\ & (m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 \\ & (u1_struct_0 X0)) \Rightarrow (k2_lattices X0 X1 X2 = k5_binop_1 (u1_struct_0 \\ & X0) (u1_lattices X0) X1 X2))) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l3_lattices X0) \Rightarrow (((\neg v2_struct_0 X0) \wedge (v10_lattices \\ & X0)) \Rightarrow ((\neg v2_struct_0 X0) \wedge ((v4_lattices X0) \wedge ((v5_lattices X0) \wedge \\ & ((v6_lattices X0) \wedge ((v7_lattices X0) \wedge ((v8_lattices X0) \wedge (v9_lattices \\ & X0)))))))) \end{aligned} \quad (18)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((v10_lattices X0) \wedge ((v14_lattices \\ & X0) \wedge (l3_lattices X0)))) \Rightarrow (\forall X1.(m1_subset_1 X1 (k5_finsub_1 \\ & (u1_struct_0 X0))) \Rightarrow (\forall X2.(m1_subset_1 X2 (k5_finsub_1 \\ & (u1_struct_0 X0))) \Rightarrow (k4_lattices X0 (k2_lattice4 X0 X1) (k2_lattice4 \\ & X0 X2) = k2_lattice4 X0 (k5_setwiseo (u1_struct_0 X0) X1 X2)))) \end{aligned}$$