

t54_lattice2
(TMU3ujKJSKqhJfQYug9SkLioeJGsRm1TYim)

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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 $k5_finsub_1 : \iota \Rightarrow \iota$ be given. Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v10_lattices : \iota \Rightarrow o$ be given. Let $v13_lattices : \iota \Rightarrow o$ be given. Let $l3_lattices : \iota \Rightarrow o$ 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 $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r3_lattices : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_lattice2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ 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 $k1_setwiseo : \iota \Rightarrow \iota$ be given. Let $k4_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u2_lattices : \iota \Rightarrow \iota$ be given. Let $k5_lattices : \iota \Rightarrow \iota$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v4_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v5_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v5_lattices : \iota \Rightarrow o$ be given. Let $l2_lattices : \iota \Rightarrow o$ be given. Let $v4_lattices : \iota \Rightarrow o$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l1_lattices : \iota \Rightarrow o$ be given. Let $v6_lattices : \iota \Rightarrow o$ 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.

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

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((v10_lattices X0) \wedge (l3_lattices X0))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\ & (\neg v1_xboole_0 X2) \Rightarrow (\forall X3. (m1_subset_1 X3 (k5_finsub_1 X2)) \Rightarrow \\ & (\forall X4. ((v1_funct_1 X4) \wedge ((v1_funct_2 X4 X2 (u1_struct_0 X0)) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 X2 (u1_struct_0 X0)))))) \Rightarrow ((\forall X5. (m1_subset_1 X5 X2) \Rightarrow ((X5 \in X3) \Rightarrow (r3_lattices X0 (k3_funct_2 X2 (u1_struct_0 X0) X4 X5) X1))) \Rightarrow ((X3 = k1_xboole_0) \vee (r3_lattices X0 (k2_lattice2 X2 X0 X3 X4) X1)))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned}
& \forall X0.(\neg v1_xboole_0 X0) \Rightarrow (\forall X1.(\neg v1_xboole_0 X1) \Rightarrow \\
& (\forall X2.((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (k2_zfmisc_1 X0 \\
& X0) X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\
& X0 X0) X0)))))) \Rightarrow (((v1_binop_1 X2 X0) \wedge ((v2_binop_1 X2 X0) \wedge (v1_setwiseo \\
& X2 X0))) \Rightarrow (\forall X3.((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 X0) \wedge \\
& (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \Rightarrow (k7_setwiseo \\
& X1 X0 X2 (k1_setwiseo X1) X3 = k4_binop_1 X0 X2))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((v10_lattices X0) \wedge (l3_lattices \\
& X0))) \Rightarrow ((v1_setwiseo (u2_lattices X0) (u1_struct_0 X0)) \Rightarrow (k5_lattices \\
& X0 = k4_binop_1 (u1_struct_0 X0) (u2_lattices X0)))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((v10_lattices X0) \wedge ((v13_lattices \\
& X0) \wedge (l3_lattices X0)))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (r3_lattices X0 (k5_lattices X0) X1))
\end{aligned} \tag{5}$$

Assume the following.

$$\exists X0.v1_xboole_0 X0 \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\exists X2.(m1_subset_1 X2 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X0 X1))) \wedge ((v1_xboole_0 X2) \wedge ((v1_relat_1 X2) \wedge ((\\
& v4_relat_1 X2 X0) \wedge (v5_relat_1 X2 X1))))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((v10_lattices X0) \wedge ((v13_lattices \\
& X0) \wedge (l3_lattices X0)))) \Rightarrow ((v1_funct_1 (u2_lattices X0)) \wedge ((v1_funct_2 \\
& (u2_lattices X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) \\
& (u1_struct_0 X0)) \wedge (v1_setwiseo (u2_lattices X0) (u1_struct_0 \\
& X0))))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((v5_lattices X0) \wedge (l2_lattices \\
& X0))) \Rightarrow ((v1_funct_1 (u2_lattices X0)) \wedge ((v1_funct_2 (u2_lattices \\
& X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 \\
& X0)) \wedge (v2_binop_1 (u2_lattices X0) (u1_struct_0 X0))))
\end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((v4_lattices X0) \wedge (l2_lattices \\
& X0))) \Rightarrow ((v1_funct_1 (u2_lattices X0)) \wedge ((v1_funct_2 (u2_lattices \\
& X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 \\
& X0)) \wedge (v1_binop_1 (u2_lattices X0) (u1_struct_0 X0))))
\end{aligned} \tag{10}$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0)\wedge(l1_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u1_struct_0 X0)) \quad (11)$$

Assume the following.

$$v1_xboole_0 k1_xboole_0 \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.(l2_lattices X0)\Rightarrow((v1_funct_1 (u2_lattices X0))\wedge \\ ((v1_funct_2 (u2_lattices X0) (k2_zfmisc_1 (u1_struct_0 X0) (\\ u1_struct_0 X0)) (u1_struct_0 X0))\wedge(m1_subset_1 (u2_lattices \\ X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (\\ u1_struct_0 X0)) (u1_struct_0 X0)))))) \quad (13) \end{aligned}$$

Assume the following.

$$\forall X0.(l3_lattices X0)\Rightarrow((l1_lattices X0)\wedge(l2_lattices X0)) \quad (14)$$

Assume the following.

$$\forall X0.(l2_lattices X0)\Rightarrow(l1_struct_0 X0) \quad (15)$$

Assume the following.

$$\forall X0.(v1_xboole_0 (k1_setwiseo X0))\wedge(m1_subset_1 (k1_setwiseo X0) (k5_finsub_1 X0)) \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0.(\neg v1_xboole_0 X0)\Rightarrow(\forall X1.((\neg v2_struct_0 X1)\wedge \\ ((v10_lattices X1)\wedge(l3_lattices X1)))\Rightarrow(\forall X2.(m1_subset_1 \\ X2 (k5_finsub_1 X0))\Rightarrow(\forall X3.((v1_funct_1 X3)\wedge((v1_funct_2 \\ X3 X0 (u1_struct_0 X1))\wedge(m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 \\ X0 (u1_struct_0 X1))))))\Rightarrow(k2_lattice2 X0 X1 X2 X3 = k7_setwiseo \\ X0 (u1_struct_0 X1) (u2_lattices X1) X2 X3)))) \quad (17) \end{aligned}$$

Assume the following.

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

Theorem 1

$$\begin{aligned} \forall X0.(\neg v1_xboole_0 X0)\Rightarrow(\forall X1.(m1_subset_1 X1 (k5_finsub_1 \\ X0))\Rightarrow(\forall X2.((\neg v2_struct_0 X2)\wedge((v10_lattices X2)\wedge((v13_lattices \\ X2)\wedge(l3_lattices X2))))\Rightarrow(\forall X3.((v1_funct_1 X3)\wedge((v1_funct_2 \\ X3 X0 (u1_struct_0 X2))\wedge(m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 \\ X0 (u1_struct_0 X2))))))\Rightarrow(\forall X4.(m1_subset_1 X4 (u1_struct_0 \\ X2))\Rightarrow((\forall X5.(m1_subset_1 X5 X0)\Rightarrow((X5 \in X1)\Rightarrow(r3_lattices \\ X2 (k3_funct_2 X0 (u1_struct_0 X2) X3 X5) X4)))\Rightarrow(r3_lattices X2 \\ (k2_lattice2 X0 X2 X1 X3) X4)))))) \end{aligned}$$