

l40_substlat

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Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k5_substlat : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_lattices : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5_finsub_1 : \iota \Rightarrow \iota$ be given. Let $k4_partfun1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_substlat : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_substlat : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $m2_subset_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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 $k5_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_binop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_substlat : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_substlat : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v3_lattices : \iota \Rightarrow o$ be given. Let $v4_finsub_1 : \iota \Rightarrow o$ be given. Let $l1_lattices : \iota \Rightarrow o$ be given. Let $u1_lattices : \iota \Rightarrow \iota$ be given. Let $l3_lattices : \iota \Rightarrow o$ be given. Let $l2_lattices : \iota \Rightarrow o$ be given. Let $u2_lattices : \iota \Rightarrow \iota$ be given. Let $g3_lattices : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (m1_subset_1 X2 (k5_finsub_1 \\
& (k4_partfun1 X0 X1))) \Rightarrow (\forall X3. (m1_subset_1 X3 (k5_finsub_1 \\
& (k4_partfun1 X0 X1))) \Rightarrow (\forall X4. (m1_subset_1 X4 (k5_finsub_1 \\
& (k4_partfun1 X0 X1))) \Rightarrow (k4_substlat X0 X1 X2 (k4_substlat X0 X1 X3 \\
& X4) = k4_substlat X0 X1 (k4_substlat X0 X1 X2 X3) X4)))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (m1_subset_1 X2 (k5_finsub_1 \\
& (k4_partfun1 X0 X1))) \Rightarrow (\forall X3. (m1_subset_1 X3 (k5_finsub_1 \\
& (k4_partfun1 X0 X1))) \Rightarrow (k3_substlat X0 X1 (k4_substlat X0 X1 X2 (\\
& k3_substlat X0 X1 X3)) = k3_substlat X0 X1 (k4_substlat X0 X1 X2 X3)))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (m1_subset_1 X2 (k5_finsub_1 \\
& (k4_partfun1 X0 X1))) \Rightarrow (\forall X3. (m1_subset_1 X3 (k5_finsub_1 \\
& (k4_partfun1 X0 X1))) \Rightarrow (k3_substlat X0 X1 (k4_substlat X0 X1 (k3_substlat \\
& X0 X1 X2) X3) = k3_substlat X0 X1 (k4_substlat X0 X1 X2 X3)))
\end{aligned} \tag{3}$$

Assume the following.

$$\forall X0.\forall X1.((\neg v1_xboole_0 X0)\wedge((\neg v1_xboole_0 X1)\wedge(m1_subset_1 X1 (k1_zfmisc_1 X0))))\Rightarrow(\forall X2.(m2_subset_1 X2 X0 X1)\Leftrightarrow(m1_subset_1 X2 X1)) \quad (4)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.(((v1_funct_1 X1)\wedge((v1_funct_2 X1 (k2_zfmisc_1 X0 X0) X0)\wedge(m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X0 X0) X0))))))\wedge((m1_subset_1 X2 X0)\wedge(m1_subset_1 X3 X0)))\Rightarrow(k5_binop_1 X0 X1 X2 X3 = k1_binop_1 X1 X2 X3) \quad (5)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.((m1_subset_1 X2 (k1_substlat X0 X1))\wedge(m1_subset_1 X3 (k1_substlat X0 X1)))\Rightarrow(k2_substlat X0 X1 X2 X2 = X2) \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.(\neg v2_struct_0 (k5_substlat X0 X1))\wedge(v3_lattices (k5_substlat X0 X1)) \quad (7)$$

Assume the following.

$$\forall X0.(\neg v1_xboole_0 (k5_finsub_1 X0))\wedge(v4_finsub_1 (k5_finsub_1 X0)) \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.\neg v1_xboole_0 (k1_substlat X0 X1) \quad (9)$$

Assume the following.

$$\forall X0.(l1_lattices X0)\Rightarrow((v1_funct_1 (u1_lattices X0))\wedge((v1_funct_2 (u1_lattices X0) (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 X0))\wedge(m1_subset_1 (u1_lattices X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)) (u1_struct_0 X0)))))) \quad (10)$$

Assume the following.

$$\forall X0.(l3_lattices X0)\Rightarrow((l1_lattices X0)\wedge(l2_lattices X0)) \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.(v3_lattices (k5_substlat X0 X1))\wedge(l3_lattices (k5_substlat X0 X1)) \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((m1_subset_1 X2 \\ & (k5_finsub_1 (k4_partfun1 X0 X1)))\wedge(m1_subset_1 X3 (k5_finsub_1 \\ & (k4_partfun1 X0 X1))))\Rightarrow(m1_subset_1 (k4_substlat X0 X1 X2 X3) (\\ & k5_finsub_1 (k4_partfun1 X0 X1))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((m1_subset_1 X2 \\ & (k1_substlat X0 X1))\wedge(m1_subset_1 X3 (k1_substlat X0 X1)))\Rightarrow(m1_subset_1 \\ & (k2_substlat X0 X1 X2 X3) (k5_finsub_1 (k4_partfun1 X0 X1))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge(l1_lattices \\ & X0))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X2 (u1_struct_0 \\ & X0))))\Rightarrow(m1_subset_1 (k2_lattices X0 X1 X2) (u1_struct_0 X0)) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.m1_subset_1 (k1_substlat X0 X1) (k1_zfmisc_1 \\ & (k5_finsub_1 (k4_partfun1 X0 X1))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((v3_lattices X2)\wedge(l3_lattices \\ & X2))\Rightarrow((X2 = k5_substlat X0 X1)\Leftrightarrow((u1_struct_0 X2 = k1_substlat X0 \\ & X1)\wedge(\forall X3.(m2_subset_1 X3 (k5_finsub_1 (k4_partfun1 X0 \\ & X1)) (k1_substlat X0 X1))\Rightarrow(\forall X4.(m2_subset_1 X4 (k5_finsub_1 \\ & (k4_partfun1 X0 X1)) (k1_substlat X0 X1))\Rightarrow((k1_binop_1 (u2_lattices \\ & X2) X3 X4 = k3_substlat X0 X1 (k2_substlat X0 X1 X3 X4))\wedge(k1_binop_1 \\ & (u1_lattices X2) X3 X4 = k3_substlat X0 X1 (k4_substlat X0 X1 X3 X4))))))))) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge(l1_lattices X0))\Rightarrow(\forall X1. \\ & (m1_subset_1 X1 (u1_struct_0 X0))\Rightarrow(\forall X2.(m1_subset_1 X2 \\ & (u1_struct_0 X0))\Rightarrow(k2_lattices X0 X1 X2 = k5_binop_1 (u1_struct_0 \\ & X0) (u1_lattices X0) X1 X2))) \end{aligned} \quad (18)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l3_lattices X0)\Rightarrow((v3_lattices X0)\Rightarrow(X0 = g3_lattices \\ & (u1_struct_0 X0) (u2_lattices X0) (u1_lattices X0))) \end{aligned} \quad (19)$$

Theorem 1

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (m1_subset_1 X2 (u1_struct_0 \\ & (k5_substlat X0 X1))) \Rightarrow (\forall X3. (m1_subset_1 X3 (u1_struct_0 \\ & (k5_substlat X0 X1))) \Rightarrow (\forall X4. (m1_subset_1 X4 (u1_struct_0 \\ & (k5_substlat X0 X1))) \Rightarrow (k2_lattices (k5_substlat X0 X1) X2 (k2_lattices \\ & (k5_substlat X0 X1) X3 X4) = k2_lattices (k5_substlat X0 X1) (k2_lattices \\ & (k5_substlat X0 X1) X2 X3) X4))) \end{aligned}$$