

# l39\_substlat

(TMV5fy9jaae5686icUB8k3K6RmKDyT9FyZf)

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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  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  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  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  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  $l1\_lattices : \iota \Rightarrow o$  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  $k3\_substlat : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  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.

$$\forall X0.\forall X1.\forall X2.(m1\_subset\_1 X2 (k5\_finsub\_1 (k4\_partfun1 X0 X1))) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (k5\_finsub\_1 (k4\_partfun1 X0 X1))) \Rightarrow (k4\_substlat X0 X1 X2 X3 = k4\_substlat X0 X1 X3 X2)) \quad (2)$$

Assume the following.

$$\forall X0.\forall X1.(m1\_subset\_1 X0 X1) \Rightarrow ((v1\_xboole\_0 X1) \vee (X0 \in X1)) \quad (3)$$

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.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((v1\_funct\_1 X1)\wedge \\ & ((v1\_funct\_2 X1 (k2\_zfmisc\_1 X0 X0) X0)\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (k2\_zfmisc\_1 X0 X0) X0)))))\wedge((m1\_subset\_1 X2 X0)\wedge \\ & (m1\_subset\_1 X3 X0)))\Rightarrow(k5\_binop\_1 X0 X1 X2 X3 = k1\_binop\_1 X1 X2 X3) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((m1\_subset\_1 X2 \\ & (k1\_substlat X0 X1))\wedge(m1\_subset\_1 X3 (k1\_substlat X0 X1)))\Rightarrow(k2\_substlat \\ & X0 X1 X2 X2 = X2) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(\neg v2\_struct\_0 (k5\_substlat X0 X1))\wedge(v3\_lattices \\ & (k5\_substlat X0 X1)) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0.\forall X1.\neg v1\_xboole\_0 (k1\_substlat X0 X1) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_lattices X0)\Rightarrow((v1\_funct\_1 (u1\_lattices X0))\wedge \\ & ((v1\_funct\_2 (u1\_lattices X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0))\wedge(m1\_subset\_1 (u1\_lattices \\ & X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\forall X0.(l3\_lattices X0)\Rightarrow((l1\_lattices X0)\wedge(l2\_lattices X0)) \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(v3\_lattices (k5\_substlat X0 X1))\wedge(l3\_lattices \\ & (k5\_substlat X0 X1)) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((m1\_subset\_1 X2 \\ & (k1\_substlat X0 X1))\wedge(m1\_subset\_1 X3 (k1\_substlat X0 X1)))\Rightarrow(m1\_subset\_1 \\ & (k2\_substlat X0 X1 X2 X3) (k5\_finsub\_1 (k4\_partfun1 X0 X1))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.m1\_subset\_1 (k1\_substlat X0 X1) (k1\_zfmisc\_1 \\ & (k5\_finsub\_1 (k4\_partfun1 X0 X1))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.((v3\_lattices\ X2)\wedge(l3\_lattices \\
& X2))\Rightarrow((X2 = k5\_substlat\ X0\ X1)\Leftrightarrow((u1\_struct\_0\ X2 = k1\_substlat\ X0 \\
& X1)\wedge(\forall X3.(m2\_subset\_1\ X3\ (k5\_finsub\_1\ (k4\_partfun1\ X0 \\
& X1))\ (k1\_substlat\ X0\ X1))\Rightarrow(\forall X4.(m2\_subset\_1\ X4\ (k5\_finsub\_1 \\
& (k4\_partfun1\ X0\ X1))\ (k1\_substlat\ X0\ X1))\Rightarrow((k1\_binop\_1\ (u2\_lattices \\
& X2)\ X3\ X4 = k3\_substlat\ X0\ X1\ (k2\_substlat\ X0\ X1\ X3\ X4))\wedge(k1\_binop\_1 \\
& (u1\_lattices\ X2)\ X3\ X4 = k3\_substlat\ X0\ X1\ (k4\_substlat\ X0\ X1\ X3\ X4))))))))) \\
& \hspace{15em} (14)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0\ X0)\wedge(l1\_lattices\ X0))\Rightarrow(\forall X1. \\
& (m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2 \\
& (u1\_struct\_0\ X0))\Rightarrow(k2\_lattices\ X0\ X1\ X2 = k5\_binop\_1\ (u1\_struct\_0 \\
& X0)\ (u1\_lattices\ X0)\ X1\ X2))) \\
& \hspace{15em} (15)
\end{aligned}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0 \\
& (k5\_substlat\ X0\ X1)))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0 \\
& (k5\_substlat\ X0\ X1)))\Rightarrow(k2\_lattices\ (k5\_substlat\ X0\ X1)\ X2\ X3 = k2\_lattices \\
& (k5\_substlat\ X0\ X1)\ X3\ X2))
\end{aligned}$$