

## t68\_tdlat\_2

(TMR4X6LiCcRJQRaYbCDGaS4j9Ux85urVY8b)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_pre\_topc : \iota \Rightarrow o$  be given. Let  $l1\_pre\_topc : \iota \Rightarrow o$  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  $v1\_tdlat\_2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_tops\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_setfam\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_tops\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_pre\_topc : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_xboole\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\forall X0. \forall X1. r1\_tarski X0 (k2\_xboole\_0 X0 X1) \quad (1)$$

Assume the following.

$$\begin{aligned} \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc X0) \wedge (l1\_pre\_topc \\ X0))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k1\_zfmisc\_1 \\ (u1\_struct\_0 X0)))) \Rightarrow ((v1\_tdlat\_2 X1 X0) \Rightarrow ((r1\_tarski (k5\_setfam\_1 \\ (u1\_struct\_0 X0) X1) (k2\_pre\_topc X0 (k1\_tops\_1 X0 (k5\_setfam\_1 \\ (u1\_struct\_0 X0) X1)))) \wedge (k2\_pre\_topc X0 (k5\_setfam\_1 (u1\_struct\_0 \\ X0) X1) = k2\_pre\_topc X0 (k1\_tops\_1 X0 (k2\_pre\_topc X0 (k5\_setfam\_1 \\ (u1\_struct\_0 X0) X1)))))))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0. ((v2\_pre\_topc X0) \wedge (l1\_pre\_topc X0)) \Rightarrow (\forall X1. \\ (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \Rightarrow ((r1\_tarski \\ X1 (k2\_pre\_topc X0 (k1\_tops\_1 X0 X1))) \Rightarrow (r1\_tarski (k4\_subset\_1 \\ (u1\_struct\_0 X0) X1 (k1\_tops\_1 X0 (k2\_pre\_topc X0 X1))) (k2\_pre\_topc \\ X0 (k1\_tops\_1 X0 (k4\_subset\_1 (u1\_struct\_0 X0) X1 (k1\_tops\_1 X0 \\ (k2\_pre\_topc X0 X1)))))))))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0. \forall X1. (m1\_subset\_1 X0 (k1\_zfmisc\_1 X1)) \Leftrightarrow (r1\_tarski X0 X1) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.((v2\_pre\_topc\ X0)\wedge(l1\_pre\_topc\ X0))\Rightarrow(\forall X1. \\ & (m1\_subset\_1\ X1\ (k1\_zfmisc\_1\ (u1\_struct\_0\ X0)))\Rightarrow(\forall X2. \\ & (m1\_subset\_1\ X2\ (k1\_zfmisc\_1\ (u1\_struct\_0\ X0)))\Rightarrow(k2\_pre\_topc \\ & X0\ (k4\_subset\_1\ (u1\_struct\_0\ X0)\ X1\ X2) = k4\_subset\_1\ (u1\_struct\_0 \\ & X0)\ (k2\_pre\_topc\ X0\ X1)\ (k2\_pre\_topc\ X0\ X2)))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((m1\_subset\_1\ X1\ (k1\_zfmisc\_1 \\ & X0))\wedge(m1\_subset\_1\ X2\ (k1\_zfmisc\_1\ X0)))\Rightarrow(k4\_subset\_1\ X0\ X1\ X2 = \\ & k2\_xboole\_0\ X1\ X2) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.\exists X1.(m1\_subset\_1\ X1\ (k1\_zfmisc\_1\ X0))\wedge(v1\_xboole\_0\ X1) \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((m1\_subset\_1\ X1\ (k1\_zfmisc\_1 \\ & X0))\wedge(m1\_subset\_1\ X2\ (k1\_zfmisc\_1\ X0)))\Rightarrow(k4\_subset\_1\ X0\ X1\ X1 = \\ & X1) \end{aligned} \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.(m1\_subset\_1\ X1\ (k1\_zfmisc\_1\ (k1\_zfmisc\_1\ X0)))\Rightarrow(m1\_subset\_1\ (k5\_setfam\_1\ X0\ X1)\ (k1\_zfmisc\_1\ X0)) \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((m1\_subset\_1\ X1\ (k1\_zfmisc\_1 \\ & X0))\wedge(m1\_subset\_1\ X2\ (k1\_zfmisc\_1\ X0)))\Rightarrow(m1\_subset\_1\ (k4\_subset\_1 \\ & X0\ X1\ X2)\ (k1\_zfmisc\_1\ X0)) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((l1\_pre\_topc\ X0)\wedge(m1\_subset\_1\ X1\ (k1\_zfmisc\_1 \\ & (u1\_struct\_0\ X0))))\Rightarrow(m1\_subset\_1\ (k2\_pre\_topc\ X0\ X1)\ (k1\_zfmisc\_1 \\ & (u1\_struct\_0\ X0))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((l1\_pre\_topc\ X0)\wedge(m1\_subset\_1\ X1\ (k1\_zfmisc\_1 \\ & (u1\_struct\_0\ X0))))\Rightarrow(m1\_subset\_1\ (k1\_tops\_1\ X0\ X1)\ (k1\_zfmisc\_1 \\ & (u1\_struct\_0\ X0))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1\_pre\_topc\ X0) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (k1\_zfmisc\_1 \\ (u1\_struct\_0\ X0))) \Rightarrow ((v4\_tops\_1\ X1\ X0) \Leftrightarrow ((r1\_tarski\ (k1\_tops\_1 \\ X0\ (k2\_pre\_topc\ X0\ X1))\ X1) \wedge (r1\_tarski\ X1\ (k2\_pre\_topc\ X0\ (k1\_tops\_1 \\ X0\ X1)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.k2\_xboole\_0\ X0\ X1 = k2\_xboole\_0\ X1\ X0 \quad (14)$$

**Theorem 1**

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0\ X0) \wedge ((v2\_pre\_topc\ X0) \wedge (l1\_pre\_topc \\ X0))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (k1\_zfmisc\_1\ (k1\_zfmisc\_1 \\ (u1\_struct\_0\ X0)))) \Rightarrow ((v1\_tdlat\_2\ X1\ X0) \Rightarrow (v4\_tops\_1\ (k4\_subset\_1 \\ (u1\_struct\_0\ X0)\ (k5\_setfam\_1\ (u1\_struct\_0\ X0)\ X1)\ (k1\_tops\_1 \\ X0\ (k2\_pre\_topc\ X0\ (k5\_setfam\_1\ (u1\_struct\_0\ X0)\ X1))))\ X0))) \end{aligned}$$