

# t16\_pencil\_1

(TMZ2EVGdrWxEtASZ9Rc7JragwZub8okBbuA)

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Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_waybel\_3 : \iota \Rightarrow o$  be given. Let  $v11\_pencil\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_pencil\_1 : \iota \Rightarrow o$  be given. Let  $k1\_pencil\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_pencil\_1 : \iota \Rightarrow o$  be given. Let  $k5\_pencil\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_relat\_1 : \iota \Rightarrow o$  be given. Let  $k4\_card\_3 : \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $g1\_pre\_topc : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_pralg\_1 : \iota \Rightarrow o$  be given. Let  $k12\_pralg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $u1\_pre\_topc : \iota \Rightarrow \iota$  be given. Let  $m3\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $k4\_pencil\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v16\_pencil\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\forall X0. \forall X1. (m1\_subset\_1 X0 X1) \Rightarrow ((v1\_xboole\_0 X1) \vee (X0 \in X1)) \quad (1)$$

Assume the following.

$$\begin{aligned} \forall X0. ((v1\_relat\_1 X0) \wedge ((v2\_relat\_1 X0) \wedge (v1\_funct\_1 X0))) \Rightarrow \\ (\forall X1. ((v1\_relat\_1 X1) \wedge ((v2\_relat\_1 X1) \wedge (v1\_funct\_1 X1)))) \Rightarrow \\ ((k4\_card\_3 X0 = k4\_card\_3 X1) \Rightarrow (X0 = X1)) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0. ((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow (\forall X1. (( \\ v1\_relat\_1 X1) \wedge (v1\_funct\_1 X1)) \Rightarrow ((k4\_card\_3 X0 = k4\_card\_3 X1) \wedge \\ (v2\_relat\_1 X0) \Rightarrow (v2\_relat\_1 X1))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0.(\neg v1\_xboole\_0 X0) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge \\ (v4\_relat\_1 X1 X0) \wedge ((v1\_funct\_1 X1) \wedge ((v1\_partfun1 X1 X0) \wedge ((v4\_waybel\_3 \\ X1) \wedge (v11\_pencil\_1 X1)))))) \Rightarrow (\neg(\neg \forall X2.(m1\_subset\_1 X2 X0) \Rightarrow \\ (v3\_pencil\_1 (k1\_pencil\_1 X0 X1 X2))) \wedge (v3\_pencil\_1 (k5\_pencil\_1 \\ X0 X1)))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0) \wedge ((v1\_relat\_1 \\ X1) \wedge ((v4\_relat\_1 X1 X0) \wedge ((v1\_funct\_1 X1) \wedge ((v1\_partfun1 X1 X0) \wedge \\ (v11\_pencil\_1 X1)))))) \wedge (m1\_subset\_1 X2 X0)) \Rightarrow (k1\_pencil\_1 X0 \\ X1 X2 = k1\_funct\_1 X1 X2) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 (k1\_zfmisc\_1 \\ X0))) \Rightarrow (\forall X2.\forall X3.(g1\_pre\_topc X0 X1 = g1\_pre\_topc \\ X2 X3) \Rightarrow ((X0 = X2) \wedge (X1 = X3))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge ( \\ (v1\_funct\_1 X1) \wedge ((v1\_partfun1 X1 X0) \wedge ((v2\_pralg\_1 X1) \wedge (v4\_waybel\_3 \\ X1)))))) \Rightarrow ((v1\_relat\_1 (k12\_pralg\_1 X0 X1)) \wedge ((v2\_relat\_1 (k12\_pralg\_1 \\ X0 X1)) \wedge ((v4\_relat\_1 (k12\_pralg\_1 X0 X1) X0) \wedge ((v1\_funct\_1 (k12\_pralg\_1 \\ X0 X1)) \wedge (v1\_partfun1 (k12\_pralg\_1 X0 X1) X0)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0.((\neg v3\_pencil\_1 X0) \wedge (l1\_pre\_topc X0)) \Rightarrow (\neg v1\_xboole\_0 \\ (u1\_pre\_topc X0)) \quad (8)$$

Assume the following.

$$\forall X0.\exists X1.m1\_subset\_1 X1 X0 \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge ( \\ (v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0)))) \Rightarrow (\forall X2.(m3\_pboole \\ X2 X0 X1) \Rightarrow ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge \\ (v1\_partfun1 X2 X0)))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((\neg v1\_xboole\_0 X0) \wedge ((v1\_relat\_1 X1) \wedge ( \\ (v4\_relat\_1 X1 X0) \wedge ((v1\_funct\_1 X1) \wedge ((v1\_partfun1 X1 X0) \wedge ((v4\_waybel\_3 \\ X1) \wedge (v11\_pencil\_1 X1)))))) \Rightarrow ((\neg v2\_struct\_0 (k5\_pencil\_1 X0 \\ X1)) \wedge (l1\_pre\_topc (k5\_pencil\_1 X0 X1))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((\neg v1\_xboole\_0 X0)\wedge((v1\_relat\_1 X1)\wedge \\ & (v4\_relat\_1 X1 X0)\wedge((v1\_funct\_1 X1)\wedge((v1\_partfun1 X1 X0)\wedge((v4\_waybel\_3 \\ & X1)\wedge(v11\_pencil\_1 X1))))))\Rightarrow(m1\_subset\_1 (k4\_pencil\_1 X0 X1) \\ & (k1\_zfmisc\_1 (k1\_zfmisc\_1 (k4\_card\_3 (k12\_pralg\_1 X0 X1)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0)\wedge((v1\_relat\_1 \\ & X1)\wedge((v4\_relat\_1 X1 X0)\wedge((v1\_funct\_1 X1)\wedge((v1\_partfun1 X1 X0)\wedge \\ & (v11\_pencil\_1 X1))))))\wedge(m1\_subset\_1 X2 X0))\Rightarrow(l1\_pre\_topc (k1\_pencil\_1 \\ & X0 X1 X2)) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 (k1\_zfmisc\_1 \\ & X0)))\Rightarrow((v1\_pre\_topc (g1\_pre\_topc X0 X1))\wedge(l1\_pre\_topc (g1\_pre\_topc \\ & X0 X1))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_pre\_topc X0)\Rightarrow((v4\_pencil\_1 X0)\Leftrightarrow(m1\_subset\_1 \\ & (u1\_struct\_0 X0) (u1\_pre\_topc X0))) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.(\neg v1\_xboole\_0 X0)\Rightarrow(\forall X1.((v1\_relat\_1 X1)\wedge \\ & (v4\_relat\_1 X1 X0)\wedge((v1\_funct\_1 X1)\wedge((v1\_partfun1 X1 X0)\wedge((v4\_waybel\_3 \\ & X1)\wedge(v11\_pencil\_1 X1))))))\Rightarrow(k5\_pencil\_1 X0 X1 = g1\_pre\_topc ( \\ & k4\_card\_3 (k12\_pralg\_1 X0 X1) (k4\_pencil\_1 X0 X1))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.(\neg v1\_xboole\_0 X0)\Rightarrow(\forall X1.((v1\_relat\_1 X1)\wedge \\ & (v4\_relat\_1 X1 X0)\wedge((v1\_funct\_1 X1)\wedge((v1\_partfun1 X1 X0)\wedge((v4\_waybel\_3 \\ & X1)\wedge(v11\_pencil\_1 X1))))))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k1\_zfmisc\_1 (k4\_card\_3 (k12\_pralg\_1 X0 X1))))))\Rightarrow((X2 = k4\_pencil\_1 \\ & X0 X1)\Leftrightarrow(\forall X3.(X3 \in X2)\Leftrightarrow(\exists X4.((v16\_pencil\_1 X4 X0)\wedge \\ & (m3\_pboole X4 X0 (k12\_pralg\_1 X0 X1))))\wedge((X3 = k4\_card\_3 X4)\wedge(\exists X5. \\ & (m1\_subset\_1 X5 X0)\wedge(m1\_subset\_1 (k1\_funct\_1 X4 X5) (u1\_pre\_topc \\ & (k1\_pencil\_1 X0 X1 X5)))))))))) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge ( \\
& \quad (v1\_funct\_1 X1) \wedge ((v1\_partfun1 X1 X0) \wedge (v2\_pralg\_1 X1)))))) \Rightarrow (\forall X2. \\
& \quad ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 \\
& \quad X2 X0)))))) \Rightarrow ((X2 = k12\_pralg\_1 X0 X1) \Leftrightarrow (\forall X3. \neg (X3 \in X0) \wedge (\forall X4. \\
& \quad (l1\_struct\_0 X4) \Rightarrow (\neg (X4 = k1\_funct\_1 X1 X3) \wedge (k1\_funct\_1 X2 X3 = u1\_struct\_0 \\
& \quad X4))))))
\end{aligned} \tag{18}$$

Assume the following.

$$\forall X0. ((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v11\_pencil\_1 X0))) \Rightarrow ((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v2\_pralg\_1 X0))) \tag{19}$$

Assume the following.

$$\forall X0. (l1\_pre\_topc X0) \Rightarrow ((v1\_pre\_topc X0) \Rightarrow (X0 = g1\_pre\_topc (u1\_struct\_0 X0) (u1\_pre\_topc X0))) \tag{20}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0. (\neg v1\_xboole\_0 X0) \Rightarrow (\forall X1. ((v1\_relat\_1 X1) \wedge ( \\
& \quad (v4\_relat\_1 X1 X0) \wedge ((v1\_funct\_1 X1) \wedge ((v1\_partfun1 X1 X0) \wedge ((v4\_waybel\_3 \\
& \quad X1) \wedge (v11\_pencil\_1 X1)))))) \Rightarrow (\neg (\forall X2. (m1\_subset\_1 X2 X0) \Rightarrow \\
& \quad ((\neg v4\_pencil\_1 (k1\_pencil\_1 X0 X1 X2)) \wedge (\neg \forall X3. (m1\_subset\_1 \\
& \quad X3 X0) \Rightarrow (v3\_pencil\_1 (k1\_pencil\_1 X0 X1 X3)))))) \wedge (v4\_pencil\_1 ( \\
& \quad k5\_pencil\_1 X0 X1)))
\end{aligned}$$