

# t13\_topalg\_2 (TMGAZSwmfjBueTKuUdohfwN- NDBVnmrZdAiG)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_topalg\_2 : \iota \Rightarrow o$  be given. Let  $m1\_pre\_topc : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_topalg\_2 : \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $m1\_borsuk\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_topalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k6\_eqrel\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_topalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_topalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_pre\_topc : \iota \Rightarrow o$  be given. Let  $l1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $r1\_borsuk\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_topalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_topalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r3\_borsuk\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r4\_borsuk\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_borsuk\_2 : \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_topmetr : \iota$  be given. 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  $k5\_topmetr : \iota$  be given. Let  $v5\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v5\_pre\_topc : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
 & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc X0) \wedge (l1\_pre\_topc \\
 & X0))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\
 & (X2 \in u1\_struct\_0 (k5\_topalg\_1 X0 X1)) \Leftrightarrow (\exists X3. (m1\_borsuk\_2 \\
 & X3 X0 X1 X1) \wedge (X2 = k6\_eqrel\_1 (k2\_topalg\_1 X0 X1) (k2\_topalg\_1 X0 \\
 & X1) (k4\_topalg\_1 X0 X1) X3))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc X0) \wedge (l1\_pre\_topc \\
 & X0))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\
 & (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow ((r1\_borsuk\_6 X0 X1 X2) \Rightarrow (\forall X3. \\
 & (m1\_borsuk\_2 X3 X0 X1 X2) \Rightarrow (\forall X4. (m1\_borsuk\_2 X4 X0 X1 X2) \Rightarrow \\
 & ((k6\_eqrel\_1 (k1\_topalg\_1 X0 X1 X2) (k1\_topalg\_1 X0 X1 X2) (k3\_topalg\_1 \\
 & X0 X1 X2) X3 = k6\_eqrel\_1 (k1\_topalg\_1 X0 X1 X2) (k1\_topalg\_1 X0 X1 \\
 & X2) (k3\_topalg\_1 X0 X1 X2) X4) \Leftrightarrow (r3\_borsuk\_2 X0 X1 X2 X3 X4))))))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_topalg\_2 X0) \wedge (m1\_pre\_topc \\ & X0 k2\_topalg\_2))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow \\ & (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_borsuk\_2 \\ & X3 X0 X1 X2) \Rightarrow (\forall X4.(m1\_borsuk\_2 X4 X0 X1 X2) \Rightarrow (r4\_borsuk\_2 \\ & X0 X1 X2 X3 X4)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc \\ & X0) \wedge (l1\_pre\_topc X0))) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge ( \\ & m1\_subset\_1 X2 (u1\_struct\_0 X0)))) \Rightarrow (r1\_borsuk\_6 X0 X1 X1) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((\neg v2\_struct\_0 \\ & X0) \wedge ((v2\_pre\_topc X0) \wedge ((v1\_borsuk\_2 X0) \wedge (l1\_pre\_topc X0)))) \wedge \\ & ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge ((m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \wedge ((m1\_borsuk\_2 X3 X0 X1 X2) \wedge (m1\_borsuk\_2 X4 X0 X1 X2)))) \Rightarrow ( \\ & (r4\_borsuk\_2 X0 X1 X2 X3 X4) \Leftrightarrow (r3\_borsuk\_2 X0 X1 X2 X3 X4)) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(m1\_subset\_1 X2 ( \\ & k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1))) \Rightarrow (k6\_eqrel\_1 X0 X1 X2 X3 = k9\_relat\_1 \\ & X2 X3) \end{aligned} \quad (6)$$

Assume the following.

$$k2\_topalg\_2 = k3\_topmetr \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc X0) \wedge \\ & (l1\_pre\_topc X0))) \wedge (m1\_subset\_1 X1 (u1\_struct\_0 X0))) \Rightarrow (\exists X2. \\ & (m1\_borsuk\_2 X2 X0 X1 X1) \wedge ((\neg v1\_xboole\_0 X2) \wedge ((v1\_relat\_1 X2) \wedge \\ & ((v4\_relat\_1 X2 (u1\_struct\_0 k5\_topmetr)) \wedge ((v5\_relat\_1 X2 (u1\_struct\_0 \\ & X0)) \wedge ((v1\_funct\_1 X2) \wedge ((v1\_partfun1 X2 (u1\_struct\_0 k5\_topmetr)) \wedge \\ & ((v1\_funct\_2 X2 (u1\_struct\_0 k5\_topmetr) (u1\_struct\_0 X0)) \wedge ( \\ & v5\_pre\_topc X2 k5\_topmetr X0)))))))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_pre\_topc X0) \Rightarrow (\forall X1.(m1\_pre\_topc X1 X0) \Rightarrow \\ & (l1\_pre\_topc X1)) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc X0) \wedge \\ & (l1\_pre\_topc X0))) \wedge (m1\_subset\_1 X1 (u1\_struct\_0 X0))) \Rightarrow (m1\_subset\_1 \\ & (k4\_topalg\_1 X0 X1) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_topalg\_1 X0 \\ & X1) (k2\_topalg\_1 X0 X1)))) \end{aligned} \quad (10)$$

Assume the following.

$$(v2\_pre\_topc\ k3\_topmetr)\wedge(l1\_pre\_topc\ k3\_topmetr) \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0\ X0)\wedge((v2\_pre\_topc\ X0)\wedge(l1\_pre\_topc \\ X0)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(k4\_topalg\_1 \\ X0\ X1 = k3\_topalg\_1\ X0\ X1\ X1)) \end{aligned} \quad (12)$$

Assume the following.

$$\forall X0.\forall X1.(r1\_tarski\ X0\ X1)\Leftrightarrow(\forall X2.(X2 \in X0)\Rightarrow \\ (X2 \in X1)) \quad (13)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0\ X0)\wedge(l1\_pre\_topc\ X0))\Rightarrow(\forall X1. \\ (m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(k2\_topalg\_1\ X0\ X1 = k1\_topalg\_1 \\ X0\ X1\ X1)) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0.\forall X1.(X1 = k1\_tarski\ X0)\Leftrightarrow(\forall X2.(X2 \in X1)\Leftrightarrow \\ (X2 = X0)) \quad (15)$$

Assume the following.

$$\forall X0.\forall X1.(X0 = X1)\Leftrightarrow((r1\_tarski\ X0\ X1)\wedge(r1\_tarski\ X1\ X0)) \quad (16)$$

Assume the following.

$$\forall X0.(m1\_pre\_topc\ X0\ k2\_topalg\_2)\Rightarrow(((\neg v2\_struct\_0\ X0)\wedge \\ (v2\_topalg\_2\ X0))\Rightarrow((\neg v2\_struct\_0\ X0)\wedge(v1\_borsuk\_2\ X0))) \quad (17)$$

Assume the following.

$$\forall X0.((v2\_pre\_topc\ X0)\wedge(l1\_pre\_topc\ X0))\Rightarrow(\forall X1. \\ (m1\_pre\_topc\ X1\ X0)\Rightarrow(v2\_pre\_topc\ X1)) \quad (18)$$

**Theorem 1**

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0\ X0)\wedge((v2\_topalg\_2\ X0)\wedge(m1\_pre\_topc \\ X0\ k2\_topalg\_2)))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow \\ (\forall X2.(m1\_borsuk\_2\ X2\ X0\ X1\ X1)\Rightarrow(u1\_struct\_0\ (k5\_topalg\_1 \\ X0\ X1) = k1\_tarski\ (k6\_eqrel\_1\ (k2\_topalg\_1\ X0\ X1)\ (k2\_topalg\_1 \\ X0\ X1)\ (k4\_topalg\_1\ X0\ X1)\ X2)))) \end{aligned}$$