

## t20\_tops\_4

(TMVX4pR1dWinkkZXFfHJZwjXiaRUFo5Ya61)

October 27, 2020

Let  $v7\_ordinal1 : \iota \Rightarrow o$  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  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k15\_euclid : \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v5\_pre\_topc : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_xreal\_0 : \iota \Rightarrow o$  be given. Let  $v2\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k7\_relset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_topreal9 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k14\_euclid : \iota \Rightarrow \iota$  be given. Let  $v2\_pre\_topc : \iota \Rightarrow o$  be given. Let  $l1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $g1\_pre\_topc : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_pre\_topc : \iota \Rightarrow \iota$  be given. Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v6\_metric\_1 : \iota \Rightarrow o$  be given. Let  $v7\_metric\_1 : \iota \Rightarrow o$  be given. Let  $v8\_metric\_1 : \iota \Rightarrow o$  be given. Let  $v9\_metric\_1 : \iota \Rightarrow o$  be given. Let  $l1\_metric\_1 : \iota \Rightarrow o$  be given. Let  $k3\_pcomps\_1 : \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_metric\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_numbers : \iota$  be given. Let  $k4\_ordinal1 : \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v2\_monoid\_0 : \iota \Rightarrow o$  be given. Let  $v5\_rltopsp1 : \iota \Rightarrow o$  be given. Let  $v13\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v2\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v3\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v4\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v5\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v6\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v7\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v8\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v1\_metric\_1 : \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $l1\_rltopsp1 : \iota \Rightarrow o$  be given. Let  $l1\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $g1\_rlvect\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $u1\_algstr\_0 : \iota \Rightarrow \iota$  be given. Let  $u1\_rlvect\_1 : \iota \Rightarrow \iota$  be given. Let  $k10\_funcsdom : \iota \Rightarrow \iota$  be given. Let  $k2\_finseq\_1 : \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0.(v7\_ordinal1 X0) \Rightarrow (u1\_struct\_0 (k14\_euclid X0) = u1\_struct\_0 (k15\_euclid X0)) \quad (1)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v2\_pre\_topc\ X0)\wedge(l1\_pre\_topc\ X0))\Rightarrow(\forall X1. \\
& ((v2\_pre\_topc\ X1)\wedge(l1\_pre\_topc\ X1))\Rightarrow(\forall X2.((v2\_pre\_topc \\
& X2)\wedge(l1\_pre\_topc\ X2))\Rightarrow(\forall X3.((v2\_pre\_topc\ X3)\wedge(l1\_pre\_topc \\
& X3))\Rightarrow(\forall X4.((v1\_funct\_1\ X4)\wedge((v1\_funct\_2\ X4\ (u1\_struct\_0 \\
& X0)\ (u1\_struct\_0\ X2))\wedge(m1\_subset\_1\ X4\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1 \\
& (u1\_struct\_0\ X0)\ (u1\_struct\_0\ X2))))))\Rightarrow(\forall X5.((v1\_funct\_1 \\
& X5)\wedge((v1\_funct\_2\ X5\ (u1\_struct\_0\ X1)\ (u1\_struct\_0\ X3))\wedge(m1\_subset\_1 \\
& X5\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1\ (u1\_struct\_0\ X1)\ (u1\_struct\_0\ X3))))))\Rightarrow \\
& (((g1\_pre\_topc\ (u1\_struct\_0\ X0)\ (u1\_pre\_topc\ X0)) = g1\_pre\_topc \\
& (u1\_struct\_0\ X1)\ (u1\_pre\_topc\ X1))\wedge((g1\_pre\_topc\ (u1\_struct\_0 \\
& X2)\ (u1\_pre\_topc\ X2)) = g1\_pre\_topc\ (u1\_struct\_0\ X3)\ (u1\_pre\_topc \\
& X3))\wedge((X4 = X5)\wedge(v5\_pre\_topc\ X4\ X0\ X2)))\Rightarrow(v5\_pre\_topc\ X5\ X1\ X3)))))) \\
& \tag{2}
\end{aligned}$$

Assume the following.

$$\forall X0.\forall X1.(X0 \in X1)\Rightarrow(m1\_subset\_1\ X0\ X1) \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0\ X0)\wedge((v6\_metric\_1\ X0)\wedge((v7\_metric\_1 \\
& X0)\wedge((v8\_metric\_1\ X0)\wedge((v9\_metric\_1\ X0)\wedge(l1\_metric\_1\ X0))))))\Rightarrow \\
& (\forall X1.((\neg v2\_struct\_0\ X1)\wedge((v6\_metric\_1\ X1)\wedge((v7\_metric\_1 \\
& X1)\wedge((v8\_metric\_1\ X1)\wedge((v9\_metric\_1\ X1)\wedge(l1\_metric\_1\ X1))))))\Rightarrow \\
& (\forall X2.((v1\_funct\_1\ X2)\wedge((v1\_funct\_2\ X2\ (u1\_struct\_0\ (k3\_pcomps\_1 \\
& X0)\ (u1\_struct\_0\ (k3\_pcomps\_1\ X1)))\wedge(m1\_subset\_1\ X2\ (k1\_zfmisc\_1 \\
& (k2\_zfmisc\_1\ (u1\_struct\_0\ (k3\_pcomps\_1\ X0))\ (u1\_struct\_0\ (k3\_pcomps\_1 \\
& X1))))))\Rightarrow((v5\_pre\_topc\ X2\ (k3\_pcomps\_1\ X0)\ (k3\_pcomps\_1\ X1))\Leftrightarrow \\
& (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\Rightarrow(\forall X4.(m1\_subset\_1 \\
& X4\ (u1\_struct\_0\ X1))\Rightarrow(\forall X5.((v1\_xreal\_0\ X5)\wedge(v2\_xxreal\_0 \\
& X5))\Rightarrow(\neg(X4 = k1\_funct\_1\ X2\ X3)\wedge(\forall X6.((v1\_xreal\_0\ X6)\wedge \\
& v2\_xxreal\_0\ X6))\Rightarrow(\neg r1\_tarski\ (k7\_rerset\_1\ (u1\_struct\_0\ (k3\_pcomps\_1 \\
& X0))\ (u1\_struct\_0\ (k3\_pcomps\_1\ X1))\ X2\ (k9\_metric\_1\ X0\ X3\ X6))\ ( \\
& k9\_metric\_1\ X1\ X4\ X5)))))))))) \\
& \tag{4}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(m1\_subset\_1\ X0\ k5\_numbers)\Rightarrow(\forall X1.(v1\_xreal\_0 \\
& X1)\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ (k15\_euclid\ X0)))\Rightarrow \\
& (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ (k14\_euclid\ X0)))\Rightarrow( \\
& (X2 = X3)\Rightarrow(k9\_metric\_1\ (k14\_euclid\ X0)\ X3\ X1 = k1\_topreal9\ X0\ X2\ X1)))))) \\
& \tag{5}
\end{aligned}$$

Assume the following.

$$k5\_numbers = k4\_ordinal1 \tag{6}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. ((\neg v1\_xboole\_0 X0) \wedge \\ & (((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 X0 X1) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X1)))))) \wedge (m1\_subset\_1 X3 X0))) \Rightarrow (k3\_funct\_2 X0 \\ & X1 X2 X3 = k1\_funct\_1 X2 X3) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k1\_zfmisc\_1 \\ & X0))) \Rightarrow (\forall X2. \forall X3. (g1\_pre\_topc X0 X1 = g1\_pre\_topc \\ & X2 X3) \Rightarrow ((X0 = X2) \wedge (X1 = X3))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. (v7\_ordinal1 X0) \Rightarrow ((v2\_monoid\_0 (k15\_euclid X0)) \wedge \\ & (v5\_rltopsp1 (k15\_euclid X0))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0. (v7\_ordinal1 X0) \Rightarrow ((v2\_pre\_topc (k15\_euclid X0)) \wedge \\ & ((v13\_algstr\_0 (k15\_euclid X0)) \wedge ((v2\_rlvect\_1 (k15\_euclid X0)) \wedge \\ & ((v3\_rlvect\_1 (k15\_euclid X0)) \wedge ((v4\_rlvect\_1 (k15\_euclid X0)) \wedge \\ & ((v5\_rlvect\_1 (k15\_euclid X0)) \wedge ((v6\_rlvect\_1 (k15\_euclid X0)) \wedge \\ & ((v7\_rlvect\_1 (k15\_euclid X0)) \wedge ((v8\_rlvect\_1 (k15\_euclid X0)) \wedge \\ & (v5\_rltopsp1 (k15\_euclid X0)))))))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. (v7\_ordinal1 X0) \Rightarrow ((\neg v2\_struct\_0 (k14\_euclid X0)) \wedge \\ & ((v1\_metric\_1 (k14\_euclid X0)) \wedge ((v6\_metric\_1 (k14\_euclid X0)) \wedge \\ & ((v7\_metric\_1 (k14\_euclid X0)) \wedge ((v8\_metric\_1 (k14\_euclid X0)) \wedge \\ & (v9\_metric\_1 (k14\_euclid X0)))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 \\ & (u1\_struct\_0 X0)) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1\_metric\_1 X0) \Rightarrow ((v1\_pre\_topc (k3\_pcomps\_1 X0)) \wedge \\ & (v2\_pre\_topc (k3\_pcomps\_1 X0))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1\_pre\_topc X0) \Rightarrow (m1\_subset\_1 (u1\_pre\_topc X0) (k1\_zfmisc\_1 \\ & (k1\_zfmisc\_1 (u1\_struct\_0 X0)))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1\_rltopsp1 X0) \Rightarrow ((l1\_rlvect\_1 X0) \wedge (l1\_pre\_topc X0)) \end{aligned} \quad (15)$$

Assume the following.

$$\forall X0.(l1\_metric\_1 X0) \Rightarrow (l1\_struct\_0 X0) \quad (16)$$

Assume the following.

$$\forall X0.(l1\_metric\_1 X0) \Rightarrow (l1\_pre\_topc (k3\_pcomps\_1 X0)) \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1\_xboole\_0 X0) \wedge \\ & (((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 X0 X1) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X1)))))) \wedge (m1\_subset\_1 X3 X0)) \Rightarrow (m1\_subset\_1 ( \\ & k3\_funct\_2 X0 X1 X2 X3) X1) \end{aligned} \quad (18)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0) \Rightarrow ((v5\_rltopsp1 (k15\_euclid X0)) \wedge (l1\_rltopsp1 (k15\_euclid X0))) \quad (19)$$

Assume the following.

$$\begin{aligned} & \forall X0.(v7\_ordinal1 X0) \Rightarrow ((v1\_metric\_1 (k14\_euclid X0)) \wedge \\ & ((v6\_metric\_1 (k14\_euclid X0)) \wedge ((v7\_metric\_1 (k14\_euclid X0)) \wedge \\ & ((v8\_metric\_1 (k14\_euclid X0)) \wedge ((v9\_metric\_1 (k14\_euclid X0)) \wedge \\ & (l1\_metric\_1 (k14\_euclid X0)))))) \end{aligned} \quad (20)$$

Assume the following.

$$\begin{aligned} & \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.((v5\_rltopsp1 X1) \wedge ( \\ & l1\_rltopsp1 X1)) \Rightarrow ((X1 = k15\_euclid X0) \Leftrightarrow ((g1\_pre\_topc (u1\_struct\_0 \\ & X1) (u1\_pre\_topc X1) = k3\_pcomps\_1 (k14\_euclid X0)) \wedge (g1\_rlvect\_1 \\ & (u1\_struct\_0 X1) (u2\_struct\_0 X1) (u1\_algstr\_0 X1) (u1\_rlvect\_1 \\ & X1) = k10\_funcsdom (k2\_finseq\_1 X0)))) \end{aligned} \quad (21)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0) \Leftrightarrow (X0 \in k4\_ordinal1) \quad (22)$$

Assume the following.

$$\forall X0.(l1\_pre\_topc X0) \Rightarrow ((v1\_pre\_topc X0) \Rightarrow (X0 = g1\_pre\_topc (u1\_struct\_0 X0) (u1\_pre\_topc X0))) \quad (23)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.(v7\_ordinal1 X1) \Rightarrow (\forall X2. \\ & ((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 (u1\_struct\_0 (k15\_euclid X0)) \\ & (u1\_struct\_0 (k15\_euclid X1)))) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (u1\_struct\_0 (k15\_euclid X0)) (u1\_struct\_0 (k15\_euclid \\ & X1)))))) \Rightarrow ((v5\_pre\_topc X2 (k15\_euclid X0) (k15\_euclid X1)) \Leftrightarrow \\ & (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 (k15\_euclid X0))) \Rightarrow ( \\ & \forall X4.((v1\_xreal\_0 X4) \wedge (v2\_xxreal\_0 X4)) \Rightarrow (\exists X5.( \\ & (v1\_xreal\_0 X5) \wedge (v2\_xxreal\_0 X5)) \wedge (r1\_tarski (k7\_relset\_1 ( \\ & u1\_struct\_0 (k15\_euclid X0)) (u1\_struct\_0 (k15\_euclid X1)) X2 \\ & (k1\_topreal9 X0 X3 X5)) (k1\_topreal9 X1 (k3\_funct\_2 (u1\_struct\_0 \\ & (k15\_euclid X0)) (u1\_struct\_0 (k15\_euclid X1)) X2 X3 X4)))))))) \end{aligned}$$