# t13_topreal9 (TMYydmiC-TYu2kH7YDkz7KCVhAUXHNmn4fmu)

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Let $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5\_numbers : \iota$ be given. Let $v1\_xreal\_0 : \iota \Rightarrow o$ be given. Let $u1\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $k15\_euclid : \iota \Rightarrow \iota$ be given. Let $k14\_euclid : \iota \Rightarrow \iota$ be given. Let $k9\_metric\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_topreal9 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v7\_ordinal1 : \iota \Rightarrow o$ be given. Let $k1\_zfmisc\_1 : \iota \Rightarrow \iota$ be given. Let $k12\_euclid : \iota \Rightarrow \iota$ be given. Let $k5\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4\_metric\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1\_metric\_1 : \iota \Rightarrow o$ be given. Let $v2\_struct\_0 : \iota \Rightarrow o$ be given. Let $r1\_xxreal\_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2\_metric\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4\_ordinal1 : \iota$ be given. Let $v8\_metric\_1 : \iota \Rightarrow o$ be given. Let $v6\_membered : \iota \Rightarrow o$ be given. Let $v1\_metric\_1 : \iota \Rightarrow o$ be given. Let $v6\_metric\_1 : \iota \Rightarrow o$ be given. Let $v7\_metric\_1 : \iota \Rightarrow o$ be given. Let $v9\_metric\_1 : \iota \Rightarrow o$ be given. Let $g1\_metric\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_euclid : \iota \Rightarrow \iota$ be given. Let $k13\_euclid : \iota \Rightarrow \iota$ be given. Let $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

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

Assume the following.

$$\forall X0.\forall X1.\forall X2.((X0 \in X1) \wedge (m1\_subset\_1\ X1\ (k1\_zfmisc\_1\ X2))) \Rightarrow (m1\_subset\_1\ X0\ X2) \tag{2}$$

Assume the following.

$$\forall X0.(m1\_subset\_1\ X0\ k5\_numbers) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ (k15\_euclid\ X0))) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ (k15\_euclid\ X0))) \Rightarrow (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ (k14\_euclid\ X0))) \Rightarrow (\forall X4.(m1\_subset\_1\ X4\ (u1\_struct\_0\ (k14\_euclid\ X0))) \Rightarrow (((X3 = X1) \wedge (X4 = X2)) \Rightarrow (k12\_euclid\ (k5\_algstr\_0\ (k15\_euclid\ X0)\ X1\ X2) = k4\_metric\_1\ (k14\_euclid\ X0)\ X3\ X4))))))) \tag{3}$$

Assume the following.

$$\forall X0.(v1\_xreal\_0\ X0) \Rightarrow (\forall X1.(l1\_metric\_1\ X1) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X1)) \Rightarrow (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X1)) \Rightarrow ((X3 \in k9\_metric\_1\ X1\ X2\ X0) \Leftrightarrow ((\neg v2\_struct\_0\ X1) \wedge (\neg r1\_xxreal\_0\ X0\ (k2\_metric\_1\ X1\ X2\ X3)))))))) \tag{4}$$

Assume the following.

$$k5\_numbers = k4\_ordinal1 \tag{5}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v8\_metric\_1\ X0)\wedge(l1\_metric\_1\ X0))\wedge((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\wedge(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))))\Rightarrow(k4\_metric\_1\ X0\ X1\ X2 = k2\_metric\_1\ X0\ X1\ X2) \tag{6}$$

Assume the following.

$$v6\_membered\ k4\_ordinal1 \tag{7}$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow((\neg v2\_struct\_0\ (k14\_euclid\ X0))\wedge((v1\_metric\_1\ (k14\_euclid\ X0))\wedge((v6\_metric\_1\ (k14\_euclid\ X0))\wedge((v7\_metric\_1\ (k14\_euclid\ X0))\wedge((v8\_metric\_1\ (k14\_euclid\ X0))\wedge(v9\_metric\_1\ (k14\_euclid\ X0))))))) \tag{8}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((l1\_metric\_1\ X0)\wedge((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\wedge(v1\_xreal\_0\ X2)))\Rightarrow(m1\_subset\_1\ (k9\_metric\_1\ X0\ X1\ X2)\ (k1\_zfmisc\_1\ (u1\_struct\_0\ X0))) \tag{9}$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow((v1\_metric\_1\ (k14\_euclid\ X0))\wedge((v6\_metric\_1\ (k14\_euclid\ X0))\wedge((v7\_metric\_1\ (k14\_euclid\ X0))\wedge((v8\_metric\_1\ (k14\_euclid\ X0))\wedge((v9\_metric\_1\ (k14\_euclid\ X0))\wedge(l1\_metric\_1\ (k14\_euclid\ X0))))))) \tag{10}$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow(k14\_euclid\ X0 = g1\_metric\_1\ (k1\_euclid\ X0)\ (k13\_euclid\ X0)) \tag{11}$$

Assume the following.

$$\forall X0.\forall X1.(r1\_tarski\ X0\ X1)\Leftrightarrow(\forall X2.(X2 \in X0)\Rightarrow(X2 \in X1)) \tag{12}$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ (k15\_euclid\ X0)))\Rightarrow(\forall X2.(v1\_xreal\_0\ X2)\Rightarrow(k1\_topreal9\ X0\ X1\ X2 = ReplSep\ (toset\ (\lambda X3 : \iota.m1\_subset\_1\ X3\ (u1\_struct\_0\ (k15\_euclid\ X0))))\ (\lambda X3 : \iota.\neg r1\_xxreal\_0\ X2\ (k12\_euclid\ (k5\_algstr\_0\ (k15\_euclid\ X0)\ X3\ X1)))\ (\lambda X3 : \iota.X3)))) \tag{13}$$

Assume the following.

$$\forall X0.\forall X1.(X0 = X1) \Leftrightarrow ((r1\_tarski\ X0\ X1) \wedge (r1\_tarski\ X1\ X0)) \tag{14}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v8\_metric\_1\ X0) \wedge (l1\_metric\_1\ X0)) \wedge ((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0)) \wedge (m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)))) \Rightarrow (k4\_metric\_1\ X0\ X1\ X2 = k4\_metric\_1\ X0\ X2\ X1) \tag{15}$$

Assume the following.

$$\forall X0.(v6\_membered\ X0) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ X0) \Rightarrow (v7\_ordinal1\ X1)) \tag{16}$$

**Theorem 1**

$$\forall X0.(m1\_subset\_1\ X0\ k5\_numbers) \Rightarrow (\forall X1.(v1\_xreal\_0\ X1) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ (k15\_euclid\ X0))) \Rightarrow (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ (k14\_euclid\ X0))) \Rightarrow ((X2 = X3) \Rightarrow (k9\_metric\_1\ (k14\_euclid\ X0)\ X3\ X1 = k1\_topreal9\ X0\ X2\ X1)))))$$