

## t15\_normsp\_2

(TMZf9bXwoa2eZVaWX9DW9F7TQdwL5nwhouj)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  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  $v3\_normsp\_0 : \iota \Rightarrow o$  be given. Let  $v4\_normsp\_0 : \iota \Rightarrow o$  be given. Let  $v2\_normsp\_1 : \iota \Rightarrow o$  be given. Let  $l1\_normsp\_1 : \iota \Rightarrow o$  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  $k3\_normsp\_2 : \iota \Rightarrow \iota$  be given. Let  $v2\_nfcont\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_pre\_topc : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  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  $k5\_numbers : \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v2\_frechet : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_frechet : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_domain\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_normsp\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_frechet2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_normsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $g1\_pre\_topc : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_numbers : \iota$  be given. Let  $g1\_metric\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_metric\_1 : \iota \Rightarrow o$  be given. Let  $v1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $k3\_pcomps\_1 : \iota \Rightarrow \iota$  be given. Let  $v2\_pre\_topc : \iota \Rightarrow o$  be given. Let  $v4\_frechet : \iota \Rightarrow o$  be given. Let  $l2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l2\_normsp\_0 : \iota \Rightarrow o$  be given. Let  $l1\_normsp\_0 : \iota \Rightarrow o$  be given. Let  $l1\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $l1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $k2\_pcomps\_1 : \iota \Rightarrow \iota$  be given. Let  $k1\_normsp\_2 : \iota \Rightarrow \iota$  be given. Let  $v1\_metric\_1 : \iota \Rightarrow o$  be given. Let  $k2\_relset\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_normsp\_2 : \iota \Rightarrow \iota$  be given. Let  $u1\_pre\_topc : \iota \Rightarrow \iota$  be given. Let  $u1\_metric\_1 : \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0. \forall X1. (r1\_tarski (k1\_tarski X0) X1) \Leftrightarrow (X0 \in X1) \quad (1)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\
& ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v3\_normsp\_0 \\
& X0) \wedge ((v4\_normsp\_0 X0) \wedge ((v2\_normsp\_1 X0) \wedge (l1\_normsp\_1 X0)))))))))) \Rightarrow \\
& (\forall X1.((v1\_funct\_1 X1) \wedge ((v1\_funct\_2 X1 k5\_numbers (u1\_struct\_0 \\
& X0)) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 k5\_numbers (u1\_struct\_0 \\
& X0)))))) \Rightarrow (\forall X2.((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 k5\_numbers \\
& (u1\_struct\_0 (k3\_normsp\_2 X0)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\
& (k2\_zfmisc\_1 k5\_numbers (u1\_struct\_0 (k3\_normsp\_2 X0)))))) \Rightarrow \\
& (((r1\_funct\_2 k5\_numbers (u1\_struct\_0 X0) k5\_numbers (u1\_struct\_0 \\
& (k3\_normsp\_2 X0)) X1 X2) \wedge (v2\_frechet X2 (k3\_normsp\_2 X0))) \Rightarrow (( \\
& k2\_frechet (k3\_normsp\_2 X0) X2 = k6\_domain\_1 (u1\_struct\_0 X0) ( \\
& k6\_normsp\_1 X0 X1)) \wedge (k2\_frechet2 (k3\_normsp\_2 X0) X2 = k6\_normsp\_1 \\
& X0 X1))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\
& ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v3\_normsp\_0 \\
& X0) \wedge ((v4\_normsp\_0 X0) \wedge ((v2\_normsp\_1 X0) \wedge (l1\_normsp\_1 X0)))))))))) \Rightarrow \\
& (\forall X1.((v1\_funct\_1 X1) \wedge ((v1\_funct\_2 X1 k5\_numbers (u1\_struct\_0 \\
& X0)) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 k5\_numbers (u1\_struct\_0 \\
& X0)))))) \Rightarrow (\forall X2.((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 k5\_numbers \\
& (u1\_struct\_0 (k3\_normsp\_2 X0)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\
& (k2\_zfmisc\_1 k5\_numbers (u1\_struct\_0 (k3\_normsp\_2 X0)))))) \Rightarrow \\
& ((r1\_funct\_2 k5\_numbers (u1\_struct\_0 X0) k5\_numbers (u1\_struct\_0 \\
& (k3\_normsp\_2 X0)) X1 X2) \Rightarrow ((v2\_frechet X2 (k3\_normsp\_2 X0)) \Leftrightarrow (v3\_normsp\_1 \\
& X1 X0))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\
& ((\neg v1\_xboole\_0 X1) \wedge ((\neg v1\_xboole\_0 X3) \wedge (((v1\_funct\_1 X4) \wedge (( \\
& v1\_funct\_2 X4 X0 X1) \wedge (m1\_subset\_1 X4 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\
& X0 X1)))))) \wedge ((v1\_funct\_1 X5) \wedge ((v1\_funct\_2 X5 X2 X3) \wedge (m1\_subset\_1 \\
& X5 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X2 X3)))))) \Rightarrow ((r1\_funct\_2 X0 X1 \\
& X2 X3 X4 X5) \Leftrightarrow (X4 = X5))
\end{aligned} \tag{4}$$

Assume the following.

$$\forall X0. \forall X1. ((\neg v1\_xboole\_0 X0) \wedge (m1\_subset\_1 X1 X0)) \Rightarrow (k6\_domain\_1 X0 X1 = k1\_tarski X1) \tag{5}$$

Assume the following.

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

Assume the following.

$$\forall X0.\forall X1.((v1\_funct\_1 X1)\wedge((v1\_funct\_2 X1 (k2\_zfmisc\_1 X0 X0) k1\_numbers)\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X0) k1\_numbers))))\Rightarrow(\forall X2.\forall X3.(g1\_metric\_1 X0 X1 = g1\_metric\_1 X2 X3)\Rightarrow((X0 = X2)\wedge(X1 = X3))) \quad (7)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_struct\_0 X0))\Rightarrow(\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (8)$$

Assume the following.

$$\forall X0.(l1\_metric\_1 X0)\Rightarrow((v1\_pre\_topc (k3\_pcomps\_1 X0))\wedge(v2\_pre\_topc (k3\_pcomps\_1 X0))) \quad (9)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge((v2\_rlvect\_1 X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge((v5\_rlvect\_1 X0)\wedge((v6\_rlvect\_1 X0)\wedge((v7\_rlvect\_1 X0)\wedge((v8\_rlvect\_1 X0)\wedge((v3\_normsp\_0 X0)\wedge((v4\_normsp\_0 X0)\wedge((v2\_normsp\_1 X0)\wedge(l1\_normsp\_1 X0))))))))))))\Rightarrow((\neg v2\_struct\_0 (k3\_normsp\_2 X0))\wedge((v2\_pre\_topc (k3\_normsp\_2 X0))\wedge(v4\_frechet (k3\_normsp\_2 X0)))) \quad (10)$$

Assume the following.

$$\forall X0.(l2\_struct\_0 X0)\Rightarrow(l1\_struct\_0 X0) \quad (11)$$

Assume the following.

$$\forall X0.(l2\_normsp\_0 X0)\Rightarrow((l1\_normsp\_0 X0)\wedge(l2\_struct\_0 X0)) \quad (12)$$

Assume the following.

$$\forall X0.(l1\_normsp\_1 X0)\Rightarrow((l1\_rlvect\_1 X0)\wedge(l2\_normsp\_0 X0)) \quad (13)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge((v2\_rlvect\_1 X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge((v5\_rlvect\_1 X0)\wedge((v6\_rlvect\_1 X0)\wedge((v7\_rlvect\_1 X0)\wedge((v8\_rlvect\_1 X0)\wedge((v3\_normsp\_0 X0)\wedge((v4\_normsp\_0 X0)\wedge((v2\_normsp\_1 X0)\wedge(l1\_normsp\_1 X0))))))))))))\Rightarrow((\neg v2\_struct\_0 (k3\_normsp\_2 X0))\wedge((v2\_pre\_topc (k3\_normsp\_2 X0))\wedge(l1\_pre\_topc (k3\_normsp\_2 X0)))) \quad (14)$$

Assume the following.

$$\forall X0.(l1\_metric\_1 X0) \Rightarrow (m1\_subset\_1 (k2\_pcomps\_1 X0) (k1\_zfmisc\_1 (k1\_zfmisc\_1 (u1\_struct\_0 X0)))) \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc X0) \wedge \\ & (l1\_pre\_topc X0))) \wedge ((v1\_funct\_1 X1) \wedge ((v1\_funct\_2 X1 k5\_numbers \\ & (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & k5\_numbers (u1\_struct\_0 X0)))))) \Rightarrow (m1\_subset\_1 (k2\_frechet2 \\ & X0 X1) (u1\_struct\_0 X0)) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v3\_normsp\_0 \\ & X0) \wedge ((v4\_normsp\_0 X0) \wedge ((v2\_normsp\_1 X0) \wedge (l1\_normsp\_1 X0)))))))))) \Rightarrow \\ & ((v1\_funct\_1 (k1\_normsp\_2 X0)) \wedge ((v1\_funct\_2 (k1\_normsp\_2 X0) \\ & (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) k1\_numbers) \wedge \\ & (m1\_subset\_1 (k1\_normsp\_2 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 \\ & (u1\_struct\_0 X0) (u1\_struct\_0 X0)) k1\_numbers)))))) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((v1\_funct\_1 X1) \wedge ((v1\_funct\_2 X1 (k2\_zfmisc\_1 \\ & X0 X0) k1\_numbers) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X0) k1\_numbers)))))) \Rightarrow ((v1\_metric\_1 (g1\_metric\_1 \\ & X0 X1)) \wedge (l1\_metric\_1 (g1\_metric\_1 X0 X1))) \end{aligned} \quad (18)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_pre\_topc X0)) \Rightarrow ((v4\_frechet \\ & X0) \Leftrightarrow (\forall X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \Rightarrow \\ & ((v4\_pre\_topc X1 X0) \Leftrightarrow (\forall X2.((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 \\ & X2 k5\_numbers (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 k5\_numbers (u1\_struct\_0 X0)))))) \Rightarrow ((v2\_frechet \\ & X2 X0) \wedge (r1\_tarski (k2\_relset\_1 (u1\_struct\_0 X0) X2) X1)) \Rightarrow (r1\_tarski \\ & (k2\_frechet X0 X2) X1)))))) \end{aligned} \quad (19)$$

Assume the following.

$$\forall X0.(l1\_metric\_1 X0) \Rightarrow (k3\_pcomps\_1 X0 = g1\_pre\_topc (u1\_struct\_0 X0) (k2\_pcomps\_1 X0)) \quad (20)$$

Assume the following.

$$\begin{aligned} \forall X0. (& \neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v3\_normsp\_0 \\ & X0) \wedge ((v4\_normsp\_0 X0) \wedge ((v2\_normsp\_1 X0) \wedge (l1\_normsp\_1 X0)))))))))) \Rightarrow \\ & (k3\_normsp\_2 X0 = k3\_pcomps\_1 (k2\_normsp\_2 X0)) \end{aligned} \quad (21)$$

Assume the following.

$$\begin{aligned} \forall X0. (& \neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v3\_normsp\_0 \\ & X0) \wedge ((v4\_normsp\_0 X0) \wedge ((v2\_normsp\_1 X0) \wedge (l1\_normsp\_1 X0)))))))))) \Rightarrow \\ & (\forall X1. (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \Rightarrow \\ & ((v2\_nfcont\_1 X1 X0) \Leftrightarrow (\forall X2. ((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 \\ & X2 k5\_numbers (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 k5\_numbers (u1\_struct\_0 X0)))))) \Rightarrow ((r1\_tarski \\ & (k2\_relset\_1 (u1\_struct\_0 X0) X2) X1) \wedge (v3\_normsp\_1 X2 X0)) \Rightarrow (k6\_normsp\_1 \\ & X0 X2 \in X1)))))) \end{aligned} \quad (22)$$

Assume the following.

$$\begin{aligned} \forall X0. (& \neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v3\_normsp\_0 \\ & X0) \wedge ((v4\_normsp\_0 X0) \wedge ((v2\_normsp\_1 X0) \wedge (l1\_normsp\_1 X0)))))))))) \Rightarrow \\ & (k2\_normsp\_2 X0 = g1\_metric\_1 (u1\_struct\_0 X0) (k1\_normsp\_2 X0)) \end{aligned} \quad (23)$$

Assume the following.

$$\forall X0. (l1\_pre\_topc X0) \Rightarrow ((v1\_pre\_topc X0) \Rightarrow (X0 = g1\_pre\_topc (u1\_struct\_0 X0) (u1\_pre\_topc X0))) \quad (24)$$

Assume the following.

$$\forall X0. (l1\_metric\_1 X0) \Rightarrow ((v1\_metric\_1 X0) \Rightarrow (X0 = g1\_metric\_1 (u1\_struct\_0 X0) (u1\_metric\_1 X0))) \quad (25)$$

**Theorem 1**

$$\begin{aligned} \forall X0. (& \neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v3\_normsp\_0 \\ & X0) \wedge ((v4\_normsp\_0 X0) \wedge ((v2\_normsp\_1 X0) \wedge (l1\_normsp\_1 X0)))))))))) \Rightarrow \\ & (\forall X1. (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \Rightarrow \\ & (\forall X2. (m1\_subset\_1 X2 (k1\_zfmisc\_1 (u1\_struct\_0 (k3\_normsp\_2 \\ & X0)))) \Rightarrow ((X1 = X2) \Rightarrow ((v2\_nfcont\_1 X1 X0) \Leftrightarrow (v4\_pre\_topc X2 (k3\_normsp\_2 \\ & X0)))))) \end{aligned}$$