

## t32\_rltopsp1

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Let  $v2\_struct.0 : \iota \Rightarrow o$  be given. Let  $v2\_pre\_topc : \iota \Rightarrow o$  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  $v6\_rltopsp1 : \iota \Rightarrow o$  be given. Let  $v7\_rltopsp1 : \iota \Rightarrow o$  be given. Let  $l1\_rltopsp1 : \iota \Rightarrow o$  be given. Let  $m1\_subset.1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_numbers : \iota$  be given. Let  $u1\_struct.0 : \iota \Rightarrow \iota$  be given. Let  $m1\_connsp.2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_rlvect.1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_xxreal.0 : \iota \Rightarrow o$  be given. Let  $r1\_xxreal.0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k18\_complex1 : \iota \Rightarrow \iota$  be given. Let  $k9\_real.1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_convex1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $k1\_zfmisc.1 : \iota \Rightarrow \iota$  be given. Let  $v3\_pre\_topc : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_tops.1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_rlvect.1 : \iota \Rightarrow o$  be given. Let  $v1\_xreal.0 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((v2\_pre\_topc X0) \wedge (l1\_pre\_topc X0)) \Rightarrow (\forall X1. \\ & (l1\_pre\_topc X1) \Rightarrow (\forall X2.(m1\_subset.1 X2 (k1\_zfmisc.1 (u1\_struct.0 \\ & X0))) \Rightarrow (\forall X3.(m1\_subset.1 X3 (k1\_zfmisc.1 (u1\_struct.0 \\ & X1))) \Rightarrow (((v3\_pre\_topc X3 X1) \Rightarrow (k1\_tops.1 X1 X3 = X3)) \wedge ((k1\_tops.1 \\ & X0 X2 = X2) \Rightarrow (v3\_pre\_topc X2 X0)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. ((r1\_tarski X0 X1) \wedge (r1\_tarski X1 X2)) \Rightarrow (r1\_tarski X0 X2) \tag{2}$$

Assume the following.

$$\forall X0. (l1\_pre\_topc X0) \Rightarrow (\forall X1. (m1\_subset.1 X1 (k1\_zfmisc.1 (u1\_struct.0 X0))) \Rightarrow (r1\_tarski (k1\_tops.1 X0 X1) X1)) \tag{3}$$

Assume the following.

$$\forall X0. \forall X1. (((v2\_pre\_topc X0) \wedge (l1\_pre\_topc X0)) \wedge (m1\_subset.1 X1 (k1\_zfmisc.1 (u1\_struct.0 X0)))) \Rightarrow (v3\_pre\_topc (k1\_tops.1 X0 X1) X0) \tag{4}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (v2\_pre\_topc X0) \wedge \\ & (l1\_pre\_topc X0))) \wedge (m1\_subset\_1 X1 (u1\_struct\_0 X0))) \Rightarrow (\forall X2. \\ & (m1\_connsp\_2 X2 X0 X1) \Rightarrow (m1\_subset\_1 X2 (k1\_zfmisc\_1 (u1\_struct\_0 \\ & X0)))) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0. (l1\_rltopsp1 X0) \Rightarrow ((l1\_rlvect\_1 X0) \wedge (l1\_pre\_topc X0)) \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((l1\_pre\_topc X0) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 \\ & (u1\_struct\_0 X0)))) \Rightarrow (m1\_subset\_1 (k1\_tops\_1 X0 X1) (k1\_zfmisc\_1 \\ & (u1\_struct\_0 X0))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge (l1\_rlvect\_1 \\ & X0)) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge (v1\_xreal\_0 X2))) \Rightarrow ( \\ & m1\_subset\_1 (k1\_rlvect\_1 X0 X1 X2) (u1\_struct\_0 X0)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_rltopsp1 X0)) \Rightarrow ((v7\_rltopsp1 \\ & X0) \Leftrightarrow (\forall X1. (m1\_subset\_1 X1 k1\_numbers) \Rightarrow (\forall X2. (m1\_subset\_1 \\ & X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. (m1\_subset\_1 X3 (k1\_zfmisc\_1 \\ & (u1\_struct\_0 X0))) \Rightarrow (\neg (v3\_pre\_topc X3 X0) \wedge ((k1\_rlvect\_1 X0 X2 \\ & X1 \in X3) \wedge (\forall X4. ((v2\_xxreal\_0 X4) \wedge (m1\_subset\_1 X4 k1\_numbers)) \Rightarrow \\ & (\forall X5. (m1\_subset\_1 X5 (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \Rightarrow \\ & (\neg (v3\_pre\_topc X5 X0) \wedge ((X2 \in X5) \wedge (\forall X6. (m1\_subset\_1 X6 k1\_numbers) \Rightarrow \\ & ((\neg r1\_xxreal\_0 X4 (k18\_complex1 (k9\_real\_1 X6 X1))) \Rightarrow (r1\_tarski \\ & (k1\_convex1 X0 X5 X6) X3))))))))))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc X0) \wedge (l1\_pre\_topc \\ & X0))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\ & (m1\_subset\_1 X2 (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \Rightarrow ((m1\_connsp\_2 \\ & X2 X0 X1) \Leftrightarrow (X1 \in k1\_tops\_1 X0 X2)))) \end{aligned} \quad (10)$$

Assume the following.

$$\forall X0. (m1\_subset\_1 X0 k1\_numbers) \Rightarrow (v1\_xreal\_0 X0) \quad (11)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_pre\_topc X0) \wedge ((v13\_algstr\_0 \\ & X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge \\ & ((v5\_rlvect\_1 X0) \wedge ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 \\ & X0) \wedge ((v6\_rltopsp1 X0) \wedge ((v7\_rltopsp1 X0) \wedge (l1\_rltopsp1 X0)))))))))) \Rightarrow \\ & (\forall X1.(m1\_subset\_1 X1 k1\_numbers) \Rightarrow (\forall X2.(m1\_subset\_1 \\ & X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_connsp\_2 X3 X0 (k1\_rlvect\_1 \\ & X0 X2 X1)) \Rightarrow (\exists X4.((v2\_xxreal\_0 X4) \wedge (m1\_subset\_1 X4 k1\_numbers)) \wedge \\ & (\exists X5.(m1\_connsp\_2 X5 X0 X2) \wedge (\forall X6.(m1\_subset\_1 X6 \\ & k1\_numbers) \Rightarrow ((\neg r1\_xxreal\_0 X4 (k18\_complex1 (k9\_real\_1 X6 X1))) \Rightarrow \\ & (r1\_tarski (k1\_convex1 X0 X5 X6) X3)))))))))) \end{aligned}$$