

## t30\_ranknull

(TMaGD73ne3ymWEaNYEfY9NyCpmthN83s1Hu)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v6\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v13\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v33\_algstr\_0 : \iota \Rightarrow o$  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  $v3\_group\_1 : \iota \Rightarrow o$  be given. Let  $v5\_group\_1 : \iota \Rightarrow o$  be given. Let  $v4\_vectsp\_1 : \iota \Rightarrow o$  be given. Let  $v5\_vectsp\_1 : \iota \Rightarrow o$  be given. Let  $l6\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v8\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v9\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v10\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v11\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  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  $v13\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_mod\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_vectsp\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_vectsp\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_ranknull : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_ranknull : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m2\_vectsp\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l2\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l5\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_finset\_1 :$

$\iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge \\
& ((v4\_rlvect\_1 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 \\
& X0) \wedge ((v5\_vectsp\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge (( \\
& v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v8\_vectsp\_1 X1 X0) \wedge ((v9\_vectsp\_1 \\
& X1 X0) \wedge ((v10\_vectsp\_1 X1 X0) \wedge ((v11\_vectsp\_1 X1 X0) \wedge (l1\_vectsp\_1 \\
& X1 X0)))))))))) \Rightarrow (\forall X2.((\neg v2\_struct\_0 X2) \wedge ((v13\_algstr\_0 \\
& X2) \wedge ((v2\_rlvect\_1 X2) \wedge ((v3\_rlvect\_1 X2) \wedge ((v4\_rlvect\_1 X2) \wedge \\
& ((v8\_vectsp\_1 X2 X0) \wedge ((v9\_vectsp\_1 X2 X0) \wedge ((v10\_vectsp\_1 X2 X0) \wedge \\
& ((v11\_vectsp\_1 X2 X0) \wedge (l1\_vectsp\_1 X2 X0)))))))))) \Rightarrow (\forall X3. \\
& ((v1\_funct\_1 X3) \wedge ((v1\_funct\_2 X3 (u1\_struct\_0 X2) (u1\_struct\_0 \\
& X1)) \wedge ((v13\_vectsp\_1 X3 X2 X1) \wedge ((v1\_mod\_2 X3 X0 X2 X1) \wedge (m1\_subset\_1 \\
& X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X2) (u1\_struct\_0 X1))))))) \Rightarrow \\
& (\forall X4.(m1\_vectsp\_6 X4 X0 X2) \Rightarrow (m2\_vectsp\_6 (k8\_ranknull \\
& X0 X2 X1 X4 X3) X0 X1 (k2\_ranknull X2 X1 X3 (k1\_vectsp\_6 X0 X2 X4))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\forall X0.(l6\_algstr\_0 X0) \Rightarrow ((l2\_algstr\_0 X0) \wedge (l5\_algstr\_0 X0)) \tag{2}$$

Assume the following.

$$\forall X0.(l2\_algstr\_0 X0) \Rightarrow ((l2\_struct\_0 X0) \wedge (l1\_algstr\_0 X0)) \tag{3}$$

Assume the following.

$$\forall X0.(l1\_struct\_0 X0) \Rightarrow (\forall X1.(l1\_vectsp\_1 X1 X0) \Rightarrow (l2\_algstr\_0 X1)) \tag{4}$$

Assume the following.

$$\forall X0.(l1\_algstr\_0 X0) \Rightarrow (l1\_struct\_0 X0) \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((\neg v2\_struct\_0 \\
& X0)\wedge((\neg v6\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge((v33\_algstr\_0 X0)\wedge \\
& ((v2\_rlvect\_1 X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge((v3\_group\_1 \\
& X0)\wedge((v5\_group\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge( \\
& l6\_algstr\_0 X0))))))))))\wedge(((\neg v2\_struct\_0 X1)\wedge((v13\_algstr\_0 \\
& X1)\wedge((v2\_rlvect\_1 X1)\wedge((v3\_rlvect\_1 X1)\wedge((v4\_rlvect\_1 X1)\wedge \\
& ((v8\_vectsp\_1 X1 X0)\wedge((v9\_vectsp\_1 X1 X0)\wedge((v10\_vectsp\_1 X1 X0)\wedge \\
& ((v11\_vectsp\_1 X1 X0)\wedge(l1\_vectsp\_1 X1 X0))))))))))\wedge(((\neg v2\_struct\_0 \\
& X2)\wedge((v13\_algstr\_0 X2)\wedge((v2\_rlvect\_1 X2)\wedge((v3\_rlvect\_1 X2)\wedge \\
& ((v4\_rlvect\_1 X2)\wedge((v8\_vectsp\_1 X2 X0)\wedge((v9\_vectsp\_1 X2 X0)\wedge \\
& ((v10\_vectsp\_1 X2 X0)\wedge((v11\_vectsp\_1 X2 X0)\wedge(l1\_vectsp\_1 X2 X0))))))))))\wedge \\
& ((m1\_vectsp\_6 X3 X0 X1)\wedge((v1\_funct\_1 X4)\wedge((v1\_funct\_2 X4 (u1\_struct\_0 \\
& X1) (u1\_struct\_0 X2))\wedge((v13\_vectsp\_1 X4 X1 X2)\wedge((v1\_mod\_2 X4 X0 \\
& X1 X2)\wedge(m1\_subset\_1 X4 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 \\
& X1) (u1\_struct\_0 X2))))))))))\Rightarrow(m1\_vectsp\_6 (k8\_ranknull X0 \\
& X1 X2 X3 X4) X0 X2)
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0)\wedge(l1\_struct\_0 X0))\wedge(((\neg v2\_struct\_0 X1)\wedge(l1\_struct\_0 X1))\wedge \\
& (((v1\_funct\_1 X2)\wedge((v1\_funct\_2 X2 (u1\_struct\_0 X0) (u1\_struct\_0 \\
& X1))\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 \\
& X0) (u1\_struct\_0 X1))))))\wedge(m1\_subset\_1 X3 (k1\_zfmisc\_1 (u1\_struct\_0 \\
& X0))))))\Rightarrow(m1\_subset\_1 (k2\_ranknull X0 X1 X2 X3) (k1\_zfmisc\_1 ( \\
& u1\_struct\_0 X1)))
\end{aligned} \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge(l2\_struct\_0 \\
& X0))\wedge(((\neg v2\_struct\_0 X1)\wedge(l1\_vectsp\_1 X1 X0))\wedge(m1\_vectsp\_6 \\
& X2 X0 X1)))\Rightarrow((v1\_finset\_1 (k1\_vectsp\_6 X0 X1 X2))\wedge(m1\_subset\_1 \\
& (k1\_vectsp\_6 X0 X1 X2) (k1\_zfmisc\_1 (u1\_struct\_0 X1))))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge(l2\_struct\_0 X0))\Rightarrow(\forall X1. \\
& ((\neg v2\_struct\_0 X1)\wedge(l1\_vectsp\_1 X1 X0))\Rightarrow(\forall X2.(m1\_subset\_1 \\
& X2 (k1\_zfmisc\_1 (u1\_struct\_0 X1)))\Rightarrow(\forall X3.(m1\_vectsp\_6 \\
& X3 X0 X1)\Rightarrow((m2\_vectsp\_6 X3 X0 X1 X2)\Leftrightarrow(r1\_tarski (k1\_vectsp\_6 X0 \\
& X1 X3) X2))))
\end{aligned} \tag{9}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\ & X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge \\ & ((v4\_rlvect\_1 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 \\ & X0) \wedge ((v5\_vectsp\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\ & ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge (( \\ & v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v8\_vectsp\_1 X1 X0) \wedge ((v9\_vectsp\_1 \\ & X1 X0) \wedge ((v10\_vectsp\_1 X1 X0) \wedge ((v11\_vectsp\_1 X1 X0) \wedge (l1\_vectsp\_1 \\ & X1 X0)))))))))) \Rightarrow (\forall X2.((\neg v2\_struct\_0 X2) \wedge ((v13\_algstr\_0 \\ & X2) \wedge ((v2\_rlvect\_1 X2) \wedge ((v3\_rlvect\_1 X2) \wedge ((v4\_rlvect\_1 X2) \wedge \\ & ((v8\_vectsp\_1 X2 X0) \wedge ((v9\_vectsp\_1 X2 X0) \wedge ((v10\_vectsp\_1 X2 X0) \wedge \\ & ((v11\_vectsp\_1 X2 X0) \wedge (l1\_vectsp\_1 X2 X0)))))))))) \Rightarrow (\forall X3. \\ & ((v1\_funct\_1 X3) \wedge ((v1\_funct\_2 X3 (u1\_struct\_0 X2) (u1\_struct\_0 \\ & X1)) \wedge ((v13\_vectsp\_1 X3 X2 X1) \wedge ((v1\_mod\_2 X3 X0 X2 X1) \wedge (m1\_subset\_1 \\ & X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X2) (u1\_struct\_0 X1))))))) \Rightarrow \\ & (\forall X4.(m1\_vectsp\_6 X4 X0 X2) \Rightarrow (r1\_tarski (k1\_vectsp\_6 X0 \\ & X1 (k8\_ranknull X0 X2 X1 X4 X3)) (k2\_ranknull X2 X1 X3 (k1\_vectsp\_6 \\ & X0 X2 X4)))))) \end{aligned}$$