

t21\_pencil\_4 (TMZiXtD-  
who2xupfLF6rKgGE83CHUmMGXhEk)

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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  $v3\_group\_1 : \iota \Rightarrow o$  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  $v2\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v3\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v4\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $l6\_algstr\_0 : \iota \Rightarrow o$  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  $v1\_matrlin : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Let  $r1\_xxreal\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $np\_1 : \iota$  be given. Let  $np\_3 : \iota$  be given. Let  $k1\_vectsp\_9 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_pencil\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_pencil\_1 : \iota \Rightarrow o$  be given. Let  $v4\_pencil\_1 : \iota \Rightarrow o$  be given. Let  $v5\_pencil\_1 : \iota \Rightarrow o$  be given. Let  $v6\_pencil\_1 : \iota \Rightarrow o$  be given. Let  $l1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k2\_vectsp\_9 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $g1\_pre\_topc : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_pre\_topc : \iota \Rightarrow o$  be given. Let  $k4\_pencil\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $u1\_pre\_topc : \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge ( \\
& (v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 \\
& X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\
& (v7\_ordinal1 X1) \Rightarrow (\forall X2. ((\neg v2\_struct\_0 X2) \wedge ((v13\_algstr\_0 \\
& X2) \wedge ((v8\_vectsp\_1 X2 X0) \wedge ((v9\_vectsp\_1 X2 X0) \wedge ((v10\_vectsp\_1 \\
& X2 X0) \wedge ((v11\_vectsp\_1 X2 X0) \wedge ((v2\_rlvect\_1 X2) \wedge ((v3\_rlvect\_1 \\
& X2) \wedge ((v4\_rlvect\_1 X2) \wedge ((v1\_matrlin X2 X0) \wedge (l1\_vectsp\_1 X2 X0)))))))))) \Rightarrow \\
& (\neg (r1\_xxreal\_0 X1 (k1\_vectsp\_9 X0 X2)) \wedge (v1\_xboole\_0 (k2\_vectsp\_9 \\
& X0 X2 X1))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge \\
& (v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 \\
& X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v8\_vectsp\_1 X1 X0) \wedge \\
& ((v9\_vectsp\_1 X1 X0) \wedge ((v10\_vectsp\_1 X1 X0) \wedge ((v11\_vectsp\_1 X1 \\
& X0) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge \\
& ((v1\_matrlin X1 X0) \wedge (l1\_vectsp\_1 X1 X0)))))))))) \Rightarrow (\forall X2. \\
& (v7\_ordinal1 X2) \Rightarrow ((r1\_xxreal\_0 np\_1 X2) \Rightarrow ((r1\_xxreal\_0 (k1\_vectsp\_9 \\
& X0 X1) X2) \vee (v6\_pencil\_1 (k5\_pencil\_4 X0 X1 X2))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge \\
& (v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 \\
& X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v8\_vectsp\_1 X1 X0) \wedge \\
& ((v9\_vectsp\_1 X1 X0) \wedge ((v10\_vectsp\_1 X1 X0) \wedge ((v11\_vectsp\_1 X1 \\
& X0) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge \\
& ((v1\_matrlin X1 X0) \wedge (l1\_vectsp\_1 X1 X0)))))))))) \Rightarrow (\forall X2. \\
& (v7\_ordinal1 X2) \Rightarrow ((r1\_xxreal\_0 np\_1 X2) \Rightarrow ((r1\_xxreal\_0 (k1\_vectsp\_9 \\
& X0 X1) X2) \vee (v5\_pencil\_1 (k5\_pencil\_4 X0 X1 X2))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge \\
& (v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 \\
& X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v8\_vectsp\_1 X1 X0) \wedge \\
& ((v9\_vectsp\_1 X1 X0) \wedge ((v10\_vectsp\_1 X1 X0) \wedge ((v11\_vectsp\_1 X1 \\
& X0) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge \\
& ((v1\_matrlin X1 X0) \wedge (l1\_vectsp\_1 X1 X0)))))))))) \Rightarrow (\forall X2. \\
& (v7\_ordinal1 X2) \Rightarrow (\neg (r1\_xxreal\_0 np\_1 X2) \wedge ((\neg r1\_xxreal\_0 (k1\_vectsp\_9 \\
& X0 X1) X2) \wedge ((r1\_xxreal\_0 np\_3 (k1\_vectsp\_9 X0 X1) \wedge (v4\_pencil\_1 \\
& (k5\_pencil\_4 X0 X1 X2))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge \\
& (v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 \\
& X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v8\_vectsp\_1 X1 X0) \wedge \\
& (v9\_vectsp\_1 X1 X0) \wedge ((v10\_vectsp\_1 X1 X0) \wedge ((v11\_vectsp\_1 X1 \\
& X0) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge \\
& ((v1\_matrlin X1 X0) \wedge (l1\_vectsp\_1 X1 X0)))))))))) \Rightarrow (\forall X2. \\
& (v7\_ordinal1 X2) \Rightarrow (\neg (r1\_xxreal\_0 np\_1 X2) \wedge ((\neg r1\_xxreal\_0 (k1\_vectsp\_9 \\
& X0 X1) X2) \wedge (v3\_pencil\_1 (k5\_pencil\_4 X0 X1 X2))))))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k1\_zfmisc\_1 \\
& X0))) \Rightarrow (\forall X2. \forall X3. (g1\_pre\_topc X0 X1 = g1\_pre\_topc \\
& X2 X3) \Rightarrow ((X0 = X2) \wedge (X1 = X3)))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0. ((v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (v1\_xboole\_0 \\
& (u1\_struct\_0 X0))
\end{aligned} \tag{7}$$

Assume the following.

$$\forall X0. (l1\_pre\_topc X0) \Rightarrow (l1\_struct\_0 X0) \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 \\
& X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v3\_group\_1 X0) \wedge \\
& ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \wedge \\
& (((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v8\_vectsp\_1 X1 X0) \wedge \\
& (v9\_vectsp\_1 X1 X0) \wedge ((v10\_vectsp\_1 X1 X0) \wedge ((v11\_vectsp\_1 X1 \\
& X0) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge \\
& ((v1\_matrlin X1 X0) \wedge (l1\_vectsp\_1 X1 X0)))))))))) \wedge (v7\_ordinal1 \\
& X2)) \Rightarrow ((v1\_pre\_topc (k5\_pencil\_4 X0 X1 X2)) \wedge (l1\_pre\_topc (k5\_pencil\_4 \\
& X0 X1 X2)))
\end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge(\neg v6\_struct\_0 \\
& X0)\wedge((v13\_algstr\_0 X0)\wedge((v33\_algstr\_0 X0)\wedge((v3\_group\_1 X0)\wedge \\
& ((v5\_group\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge((v2\_rlvect\_1 \\
& X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge(l6\_algstr\_0 X0))))))))))\wedge \\
& (((\neg v2\_struct\_0 X1)\wedge((v13\_algstr\_0 X1)\wedge((v8\_vectsp\_1 X1 X0)\wedge \\
& ((v9\_vectsp\_1 X1 X0)\wedge((v10\_vectsp\_1 X1 X0)\wedge((v11\_vectsp\_1 X1 \\
& X0)\wedge((v2\_rlvect\_1 X1)\wedge((v3\_rlvect\_1 X1)\wedge((v4\_rlvect\_1 X1)\wedge \\
& ((v1\_matrlin X1 X0)\wedge(l1\_vectsp\_1 X1 X0))))))))))\wedge(v7\_ordinal1 \\
& X2))\Rightarrow(m1\_subset\_1 (k4\_pencil\_4 X0 X1 X2) (k1\_zfmisc\_1 (k1\_zfmisc\_1 \\
& (k2\_vectsp\_9 X0 X1 X2))))
\end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge(\neg v6\_struct\_0 X0)\wedge \\
& ((v13\_algstr\_0 X0)\wedge((v33\_algstr\_0 X0)\wedge((v3\_group\_1 X0)\wedge((v5\_group\_1 \\
& X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge((v2\_rlvect\_1 X0)\wedge \\
& ((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge(l6\_algstr\_0 X0))))))))))\wedge \\
& (((\neg v2\_struct\_0 X1)\wedge((v13\_algstr\_0 X1)\wedge((v8\_vectsp\_1 X1 X0)\wedge \\
& ((v9\_vectsp\_1 X1 X0)\wedge((v10\_vectsp\_1 X1 X0)\wedge((v11\_vectsp\_1 X1 \\
& X0)\wedge((v2\_rlvect\_1 X1)\wedge((v3\_rlvect\_1 X1)\wedge((v4\_rlvect\_1 X1)\wedge \\
& (l1\_vectsp\_1 X1 X0))))))))))\Rightarrow(v7\_ordinal1 (k1\_vectsp\_9 X0 X1))
\end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge(\neg v6\_struct\_0 X0)\wedge((v13\_algstr\_0 \\
& X0)\wedge((v33\_algstr\_0 X0)\wedge((v3\_group\_1 X0)\wedge((v5\_group\_1 X0)\wedge \\
& (v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge((v2\_rlvect\_1 X0)\wedge((v3\_rlvect\_1 \\
& X0)\wedge((v4\_rlvect\_1 X0)\wedge(l6\_algstr\_0 X0))))))))\Rightarrow(\forall X1. \\
& (((\neg v2\_struct\_0 X1)\wedge((v13\_algstr\_0 X1)\wedge((v8\_vectsp\_1 X1 X0)\wedge \\
& ((v9\_vectsp\_1 X1 X0)\wedge((v10\_vectsp\_1 X1 X0)\wedge((v11\_vectsp\_1 X1 \\
& X0)\wedge((v2\_rlvect\_1 X1)\wedge((v3\_rlvect\_1 X1)\wedge((v4\_rlvect\_1 X1)\wedge \\
& ((v1\_matrlin X1 X0)\wedge(l1\_vectsp\_1 X1 X0))))))))\Rightarrow(\forall X2. \\
& (v7\_ordinal1 X2)\Rightarrow(k5\_pencil\_4 X0 X1 X2 = g1\_pre\_topc (k2\_vectsp\_9 \\
& X0 X1 X2) (k4\_pencil\_4 X0 X1 X2)))
\end{aligned} \tag{12}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xxreal\_0 X0)\wedge(v1\_xxreal\_0 X1))\Rightarrow( (r1\_xxreal\_0 X0 X1)\vee(r1\_xxreal\_0 X1 X0)) \tag{13}$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0)\Rightarrow(v1\_xxreal\_0 X0) \tag{14}$$

Assume the following.

$$\forall X0.(l1\_pre\_topc X0)\Rightarrow((v1\_pre\_topc X0)\Rightarrow(X0 = g1\_pre\_topc (u1\_struct\_0 X0) (u1\_pre\_topc X0))) \tag{15}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\ & X0) \wedge ((v33\_algstr\_0 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge \\ & (v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 \\ & X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\ & ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v8\_vectsp\_1 X1 X0) \wedge \\ & (v9\_vectsp\_1 X1 X0) \wedge ((v10\_vectsp\_1 X1 X0) \wedge ((v11\_vectsp\_1 X1 \\ & X0) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge \\ & ((v1\_matrlin X1 X0) \wedge (l1\_vectsp\_1 X1 X0)))))))))) \Rightarrow (\forall X2. \\ & (v7\_ordinal1 X2) \Rightarrow (((r1\_xxreal\_0 np\_1 X2) \wedge (r1\_xxreal\_0 np\_3 \\ & (k1\_vectsp\_9 X0 X1))) \Rightarrow ((r1\_xxreal\_0 (k1\_vectsp\_9 X0 X1) X2) \vee \\ & (\neg v2\_struct\_0 (k5\_pencil\_4 X0 X1 X2)) \wedge ((\neg v3\_pencil\_1 (k5\_pencil\_4 \\ & X0 X1 X2)) \wedge ((\neg v4\_pencil\_1 (k5\_pencil\_4 X0 X1 X2)) \wedge ((v5\_pencil\_1 \\ & (k5\_pencil\_4 X0 X1 X2)) \wedge ((v6\_pencil\_1 (k5\_pencil\_4 X0 X1 X2)) \wedge \\ & (l1\_pre\_topc (k5\_pencil\_4 X0 X1 X2)))))))))) \end{aligned}$$