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Linear Algebra 1

Homework 4

1b.  $t \begin{pmatrix} 2 \\ -1 \\ 1 \end{pmatrix} + t \begin{pmatrix} 2 \\ -1 \\ 1 \end{pmatrix} = \begin{pmatrix} 4 \\ -2 \\ 2 \end{pmatrix}$  when  $t=1$   
it is a <sup>closed</sup> subspace

c.  $t \begin{pmatrix} 0 \\ 2 \end{pmatrix} + t \begin{pmatrix} 1 \\ 4 \end{pmatrix}$  when  $t=1 = \begin{pmatrix} 1 \\ 6 \end{pmatrix}$   
when  $t=2 = \begin{pmatrix} 2 \\ 8 \end{pmatrix}$   
it is not a closed subspace  
is  $t \begin{pmatrix} 0 \\ 2 \end{pmatrix} + t \begin{pmatrix} 1 \\ 4 \end{pmatrix}$  it would

d.  $\left[ \begin{array}{cccc|c} 1 & 4 & 3 & 1 & 0 \\ 4 & 16 & 12 & 0 & 0 \end{array} \right] \xrightarrow{R_2 - R_1 = 4R_1} \left[ \begin{array}{cccc|c} 1 & 4 & 3 & 1 & 0 \\ 0 & 0 & 0 & -4 & 0 \end{array} \right]$

e.  $s \begin{pmatrix} 2 \\ 0 \\ 1 \end{pmatrix} + t \begin{pmatrix} 2 \\ -1 \\ 0 \end{pmatrix}$  is  $s=t=1 = \begin{pmatrix} 4 \\ -1 \\ 1 \end{pmatrix}$  is  $s=1, t=2 = \begin{pmatrix} 6 \\ -2 \\ 1 \end{pmatrix}$   
not a subspace

2b. No

2c. Yes