

**Quiz number 2 solution**

Show all work. How you get your answer is just as important, if not more important, than the answer itself. If you think it, write it!

Show that the vector  $\begin{bmatrix} -3 \\ 4 \\ 16 \\ -6 \end{bmatrix}$  is in the span of the vectors  $\begin{bmatrix} 2 \\ 3 \\ 4 \\ -1 \end{bmatrix}$ ,  $\begin{bmatrix} 4 \\ 2 \\ -3 \\ 3 \end{bmatrix}$ , and  $\begin{bmatrix} 1 \\ 2 \\ 2 \\ 2 \end{bmatrix}$ .

(Express it as a linear combination.)

**Solution:** This translates to finding a solution to the linear system  $\begin{pmatrix} 2 & 4 & 1 & | & -3 \\ 3 & 2 & 2 & | & 4 \\ 4 & -3 & 2 & | & 16 \\ -1 & 3 & 2 & | & -6 \end{pmatrix}$

. We proceed by row reduction:

$$\begin{pmatrix} 2 & 4 & 1 & | & -3 \\ 3 & 2 & 2 & | & 4 \\ 4 & -3 & 2 & | & 16 \\ -1 & 3 & 2 & | & -6 \end{pmatrix} \rightarrow \begin{pmatrix} -1 & 3 & 2 & | & -6 \\ 2 & 4 & 1 & | & -3 \\ 3 & 2 & 2 & | & 4 \\ 4 & -3 & 2 & | & 16 \end{pmatrix} \rightarrow \begin{pmatrix} 1 & -3 & -2 & | & 6 \\ 2 & 4 & 1 & | & -3 \\ 3 & 2 & 2 & | & 4 \\ 4 & -3 & 2 & | & 16 \end{pmatrix}$$

$$\rightarrow \begin{pmatrix} 1 & -3 & -2 & | & 6 \\ 0 & 10 & 5 & | & -15 \\ 0 & 11 & 8 & | & -14 \\ 0 & 9 & 10 & | & -8 \end{pmatrix} \rightarrow$$

**Quiz number 2 solution**

Show all work. How you get your answer is just as important, if not more important, than the answer itself. If you think it, write it!

Show that the vector  $\begin{bmatrix} 3 \\ 4 \\ -4 \\ 11 \end{bmatrix}$  is in the span of the vectors  $\begin{bmatrix} 1 \\ 2 \\ 4 \\ 1 \end{bmatrix}$ ,  $\begin{bmatrix} 3 \\ 2 \\ -3 \\ 3 \end{bmatrix}$ , and  $\begin{bmatrix} 2 \\ 1 \\ 2 \\ -2 \end{bmatrix}$ .  
(Express it as a linear combination.)