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Homework # 2

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The problem asks to write the augmented matrix for the linear system Ax = b and then solve the system and write the solution as a vector.

$$A = \begin{bmatrix} 1 & 3 & -4 \\ 1 & 5 & 2 \\ -3 & -7 & 6 \end{bmatrix}, b = \begin{bmatrix} -2 \\ 4 \\ 12 \end{bmatrix}$$

$$\text{so, } \begin{bmatrix} 1 & 3 & -4 & -2 \\ 1 & 5 & 2 & 4 \\ -3 & -7 & 6 & 12 \end{bmatrix}, \; x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -11 \\ 3 \\ 0 \end{bmatrix}$$

13. Yes **u** is in the plane spanned by the colums of A because when you take a look inside the parallelogram **u** is included.

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The vector: $\begin{bmatrix} 5 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 7 \\ 2 \\ -6 \end{bmatrix}, \begin{bmatrix} 9 \\ 4 \\ 8 \end{bmatrix}$ is lenear independent because neither of the vectors is a mulptiple of the other and the arrows are not coplanar.

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The vector: $\begin{bmatrix} 2 \\ -2 \end{bmatrix}, \begin{bmatrix} -4 \\ 6 \end{bmatrix}$ is lenear dependent because the two vector are certainly multiple of one other and there's a solution.