

MATH 215
Practice

1. Solve the given systems of equations. Show **ALL** row operations that you used.

$$\begin{aligned}4x_1 - 3x_2 &= 10 \\8x_1 - x_2 &= 10\end{aligned}$$

$$\begin{aligned}x_1 + 2x_2 + x_3 &= 1 \\3x_1 + x_2 + 4x_3 &= 0 \\2x_1 + 2x_2 + 3x_3 &= 2\end{aligned}$$

$$\begin{aligned}x_1 + 4x_2 - 2x_3 &= 4 \\2x_1 + 7x_2 - x_3 &= -2 \\2x_1 + 9x_2 - 7x_3 &= 1\end{aligned}$$

$$\begin{aligned}x_1 - 3x_2 + 2x_3 - x_4 &= 8 \\3x_1 - 7x_2 + x_4 &= 0\end{aligned}$$

$$A = \begin{pmatrix} 1 & 2 & 4 \\ -2 & -3 & -5 \\ 2 & 1 & -1 \end{pmatrix}$$

2. Are the columns of A linearly independent or linearly dependent?

3. Do the columns of A span \mathbf{R}^3 ?

4. Let $b = \begin{pmatrix} -5 \\ 6 \\ 2 \end{pmatrix}$ Does $Ax = b$ have a solution? If so find x , if not state why.

5. Is the vector $b = \begin{pmatrix} 3 \\ 5 \\ 8 \end{pmatrix}$ in the span $\left\{ \begin{pmatrix} 0 \\ 2 \\ 4 \end{pmatrix}, \begin{pmatrix} 1 \\ 4 \\ -2 \end{pmatrix}, \begin{pmatrix} -3 \\ -1 \\ 5 \end{pmatrix} \right\}$?

6. Determine if the following set of vectors are linearly independent or linearly dependent.

$$\left\{ \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} -1 \\ 1 \\ -1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ -1 \\ -1 \\ 1 \end{pmatrix} \right\}$$