

Math 324 - Additional Problems HW#6

1. In \mathbb{R}^2 calculate and graph $\text{span}(X)$ for each of the following X sets:

(a) $X = \left\{ \begin{bmatrix} 0 \\ 0 \end{bmatrix} \right\}$

(b) $X = \left\{ \begin{bmatrix} 3 \\ 1 \end{bmatrix} \right\}$

(c) $X = \left\{ \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 2 \\ 3 \end{bmatrix} \right\}$

(d) $X = \left\{ \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 2 \\ 2 \end{bmatrix} \right\}$

(e) $X = \left\{ \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \end{bmatrix}, \begin{bmatrix} 2 \\ 3 \end{bmatrix} \right\}$

2. In \mathbb{R}^3 calculate and graph $\text{span} \left(\left\{ \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix} \right\} \right)$.

3. In $\mathbb{R}[x]$:

(a) Calculate $\text{span}(\{1, x, x^2\})$. Do you recognize this subspace?

(b) Calculate $\text{span}(\{1, x^2, x^4\})$.

4. In M_{22} :

(a) Calculate $W = \text{span} \left(\left\{ \begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ 0 & -1 \end{bmatrix} \right\} \right)$.

(b) Show that $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix} \in W$.

5. In $F(-\infty, \infty)$ calculate $\text{span}(\{e^x, e^{2x}\})$.