Box #_____
Math 65 Section 1
Homework 1
15 May 2018

Collaborators:

Poole 6.1 #28 Determine whether W is a subspace of V.

$$V = M_{22}, \quad W = \left\{ \begin{bmatrix} a & b \\ b & 2a \end{bmatrix} \right\}.$$

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Poole 6.1 #34 Determine whether W is a subspace of V.

$$V = \mathscr{P}_2, \quad W = \left\{bx + cx^2\right\}.$$

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Poole 6.1 #36 Determine whether W is a subspace of V.

$$V = \mathscr{P}_2, \quad W = \left\{a + bx + cx^2 : abc = 0\right\}.$$

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Poole 6.1 #38 Determine whether W is a subspace of V.

$$V = \mathscr{F}, \quad W = \{f \text{ in } \mathscr{F} : f(-x) = f(x)\}.$$

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Poole 6.1 #46 Let V be a vector space with subspaces U and W. Prove that $U \cap W$ is a subspace of V.

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Poole 6.1 #48 Let V be a vector space with subspaces U and W. Define the **sum of U and W** to be

$$U + W = \{\mathbf{u} + \mathbf{w} : \mathbf{u} \text{ is in } U, \mathbf{w} \text{ is in } W\}$$

(a) If $V = \mathbb{R}^3$, U is the x-axis, and W is the y-axis, what is $U + W$?

(b) If U and W are subspaces of a vector space V, prove that $U + W$ is a subspace of V.

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Poole 6.1 #60 Is M_{22} spanned by $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}, \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}, \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}, \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$?

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Poole 6.1 #62 Is $\mathscr{P}_2$ spanned by $1+x+2x^2, 2+x+2x^2, -1+x+2x^2$?

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