

Group Members Names: _____

FALL 2025 Math 310 Schwitzerlett Worksheet # 1 August 28, 2025

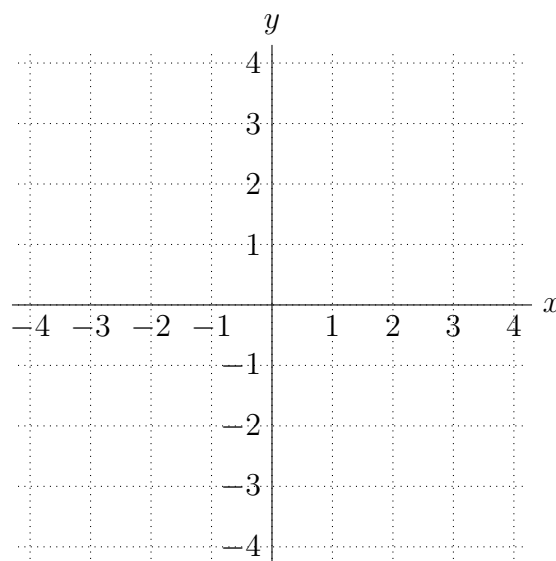
Work each problem thoroughly, show all necessary work. Each group should turn in 1 paper.

1. Draw and label the following vectors on the xy -plane below.

(a) $\mathbf{v} = \begin{bmatrix} 4 \\ 1 \end{bmatrix}$

(b) $\mathbf{w} = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$

(c) $\mathbf{v} + \mathbf{w}$.



2. Write the vector $\begin{bmatrix} 1 \\ 3 \end{bmatrix}$ as a *linear combination* of the vectors $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$ and $\begin{bmatrix} -1 \\ 1 \end{bmatrix}$. In other words, solve for real numbers c and d such that

$$c \begin{bmatrix} 1 \\ 1 \end{bmatrix} + d \begin{bmatrix} -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}.$$

3. Consider the problem $A\vec{y} = \vec{b}$ given below.

$$\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \end{bmatrix}$$

(a) Write the solution in the form of $\vec{y} = A^{-1}\vec{b}$.

(b) Are the columns of A independent or dependent? Justify your answer.