

Section 1.3 Part I: Vector Equations

MATH 204: Linear Algebra
Prepare for class September 3, 2018

Name (Print): _____

After reading/rereading Section 1.3 (pages 24-29), answer the following questions.

Note: Most texts that you will read represent a vector in boldface like this: \mathbf{v} . We cannot really write in boldface, so generally we write vectors by hand with arrows above them like this: \vec{v} .

1. Definitions and related questions...

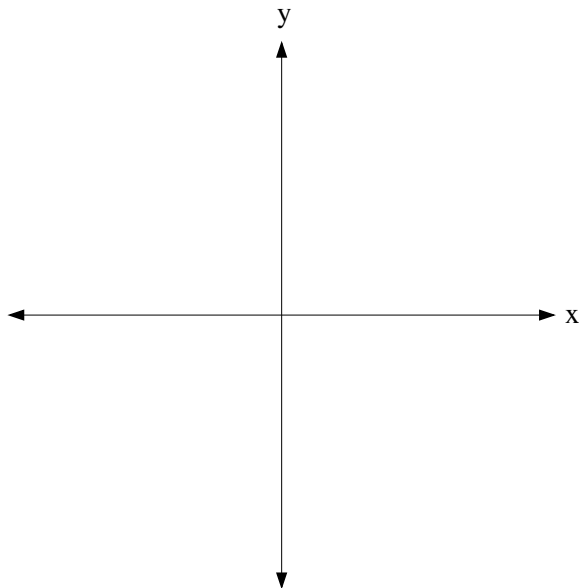
(a) What is a vector?

(b) What does it mean for two vectors to be equal?

(c) Does order matter when you are writing a vector? Explain.

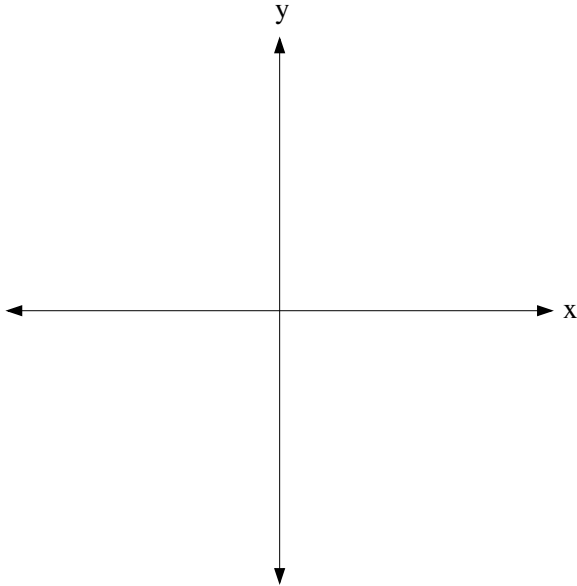
2. Suppose $\mathbf{u} = \begin{bmatrix} -1 \\ 7 \end{bmatrix}$ and $\mathbf{v} = \begin{bmatrix} 4 \\ -2 \end{bmatrix}$. Showing your work, find $6\mathbf{u} - 3\mathbf{v}$.

3. Draw geometric representations of \mathbf{u} and \mathbf{v} .



4. State the Parallelogram Rule for Addition

5. Suppose $\mathbf{u} = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ and $\mathbf{v} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$. Use what you learned about the Parallelogram Rule for Addition in your reading to illustrate $\mathbf{u} + \mathbf{v}$.



6. Algebraic Properties of Vectors in \mathbb{R}^n

Fill in the right hand side of each equality of each property. Do you know what each property is called? Write it in the parenthesis. What assumptions should be made (i.e. what are the hypotheses of the theorem here)?

- (1) () $\mathbf{u} + \mathbf{v} =$
- (2) () $(\mathbf{u} + \mathbf{v}) + \mathbf{w} =$
- (3) () $\mathbf{u} + \mathbf{0} =$
- (4) () $\mathbf{u} + (-\mathbf{u}) =$
- (5) () $c(\mathbf{u} + \mathbf{v}) =$
- (6) () $(c + d)\mathbf{u} =$
- (7) () $c(d\mathbf{u}) =$
- (8) () $1(\mathbf{u}) =$