

## Vectors Day 1 Notes

EQ: How do I find the magnitude and direction of a vector quantity?

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What is the difference between a scalar and a vector quantity?

### SCALAR

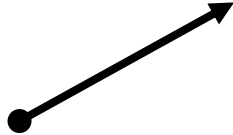
- a line segment
- examples:

VS.

### VECTOR

- a directed line segment
- has a magnitude and directions
- examples:

What are the parts of a vector?



Where does a position vector begin?

Unit Vector: a vector with a magnitude of one

Zero Vector: a vector with no direction and a magnitude of zero

Position Vector: has an initial point at the \_\_\_\_\_

Ex. Find the position vector of a vector starting at (-2,5) and terminating at (3,7)

What does the magnitude represent?

Magnitude: the \_\_\_\_\_ of a vector

ex.

$$\|v\| = \sqrt{a^2 + b^2}$$

ex.  $u = 2i - 3j$

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Summary

How do I perform operations with vector quantities?

### Vector Operations Part 1

Ex.  $u = \langle 2, -1 \rangle$  and  $v = \langle 4, 2 \rangle$  Find  $2v + 3u$  and  $v - u$ .

Geometrically:

Algebraically:

How do I find the horizontal or vertical component of a vector?

Horizontal and Vertical Components  $\cos \theta = \frac{a}{\|v\|}$  OR  $a = \|v\| \cos \theta$



Ex. A vector has a magnitude of 8 and direction  $\frac{\pi}{3}$ .

Find the horizontal & vertical components in  $i + j$  form

How do I find the direction of a given vector?

Ex. Find the magnitude and direction of  $u = -\sqrt{3}i + j$