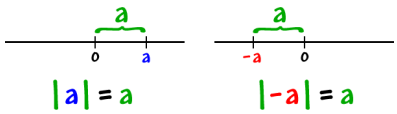
Wednesday, September 5, 2018

6.1 An Introduction to Vectors

Vocabulary

magnitude - the absolute value of a quantity; distance from zero on a number line without regard for direction



scalar - a quantity that can be completely described by its magnitude

vector - a quantity that requires both a magnitude and a direction for a complete description

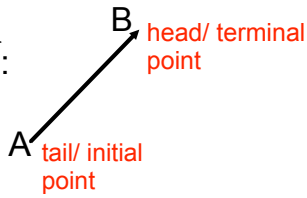
ex/ Identify each of the following as a vector or scalar quantity:

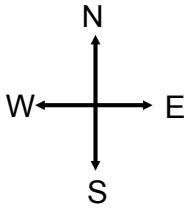
mass, weight, speed, velocity, displacement

Representing Vectors

We use directed line segments (arrows) to represent vectors. The magnitude is represented by the length of the line segment, and the arrow head shows direction.

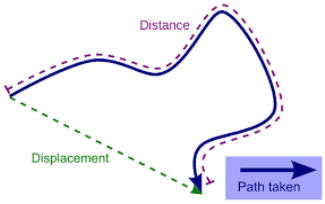
Vector $\overrightarrow{AB}$:





Practice:

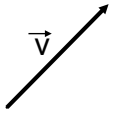
Draw vectors that represent a distance of 30 km NE, a force of 50 N acting downward, and a velocity of 80 km/h on a bearing of 315°. (hint: bearings are measured clockwise from north).



Vector Notation

We can represent vectors using two letters with an arrow above them (see previous slide), where the first letter represents the tail and the second letter represents the head of the vector.

We can also use a single letter with an arrow above it to denote a vector.



Vector quantities will be indicated by an arrow above the letter or bold font. Scalar quantities are represented by ordinary letters. BE CAREFUL WITH YOUR NOTATION!

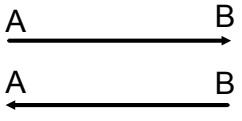
To represent the magnitude of $\vec{v}$, we use absolute value brackets.

For vector $\vec{v}$, the magnitude is $|\vec{v}|$ (scalar quantity)

Equal Vectors and Opposite Vectors

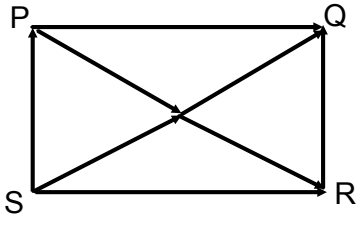
What must be the same for $\vec{u}$ and $\vec{v}$ to be equal? What do you think would make them opposite vectors?

Are $\overrightarrow{AB}$ and $\overrightarrow{BA}$ equal or opposite vectors?



Practice Problem

Rectangle PQRS is shown below, with diagonals intersecting at T.



State:

a) two pairs of equivalent vectors.

b) two pairs of opposite vectors.

c) two pairs of vectors with equal magnitude that are perpendicular to each other.