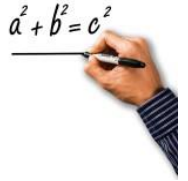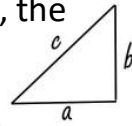# 2D Vectors, Speed, Velocity, & Acceleration
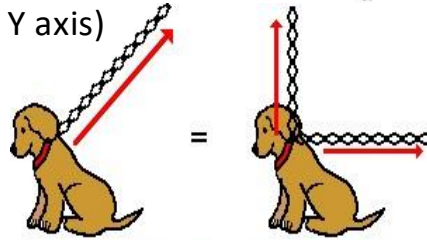
2D Vector Resultants and Components

- For two vectors that form a_____with each other, the resultant can be found using the_____!!

- Some vectors move in____ _____(X & Y axis)

- Each _____ of a two-dimensional vector is known as a _____.

- If a _____ angle and _____ is given for the two dimensional vector, the _____ can be found using _____. (SOHCAHTOA)

$$a^2 + b^2 = c^2$$

$$\sin(\theta) = \frac{Opp}{Hyp}$$

$$\cos(\theta) = \frac{Adj}{Hyp}$$

$$\tan(\theta) = \frac{Opp}{Adj}$$

MOTION (Kinematics)

Motion is one of the most IMPORTANT physical quantities in the universe and there are SEVERAL things that we can measure about motion

HOW FAR? HOW LONG? HOW FAST? IS THAT RATE CHANGING?

SPEED

The _____ at which an object travels a _____ in a set amount of _____

Units:

$$S = \frac{d}{t}$$

VELOCITY

AVERAGE

The _____ in an object's _____ in a set amount of _____

Units:

$$V_{avg} = \frac{\Delta X}{\Delta t} \quad \frac{X_f - X_i}{t_F - t_i}$$

INSTANTANEOUS

The _____ in an object's _____ in a SPECIFIC _____ in time

$$V_{ins} = \frac{\Delta X}{t}$$

ACCELERATION

the _____ of _____ in _____

An object is accelerating if:
- It is _____ up
- It is _____ down
- It is _____ direction

$$a = \frac{\Delta V}{\Delta t} \quad \frac{V_f - V_i}{t_F - t_i}$$