Vectors are numbers that have magnitude and direction. Eg (displacement, velocity, acceleration, and force.)

Scalars are numbers that have magnitude only and no direction. Eg (distance, speed, energy, pressure, and mass.)

When adding vectors, add tip-to-tail.

Sin θ =

Cos θ =

Tan θ=

X = V Cos θ

Y = V Sin θ

Multiplying vectors = A · B = | A | | B | cos θ

Torque = force X lever arm \* sin θ == A × B = | A | | B | sin θ

Vector multiplication is not commutative ( A × B ≠ B × A )

Right hand rule: 1) point thumb in vector A direction 2) extend fingers in direction of vector B. 3) direction where plam is now facing is the resultant of vector C.

1.3

Displacement = change in position in space (has both magnitude and direction)

Velocity = (v) is a vector. Measured as the rate of change of displacement in a given unit of time. Measured in meters/ second.

Force ( F ) is a vector quantity that is experienced as pushing or pulling on objects.

Newton (N) = kg\* m / s^2

Gravitational force = G= 6.67x10^(-11) N\*m^2 / kg^2

Friction = force that opposes the movement of objects.

Static friction = friction that exists between a stationary object and the surface which it rests on.   
0 ≤ ≤ N

N = normal force   
= coefficient of static friction

Kinetic friction =

= coefficient of kinetic friction

N = normal force