Physics Formulas

Velocity

Constant Velocity

$$v = \frac{d}{t}$$
$$d = v * t$$
$$t = \frac{d}{v}$$

Accelerated Velocity

$$a = \frac{v_f - v_i}{t}$$
$$v_f = at + v_i$$
$$d = \frac{1}{2}at^2 + v_i t$$
$$v_f^2 = 2ad + v_i^2$$
$$d = \frac{v_i + v_f}{2} * t$$

- a: Acceleration
- t: Time
- d: Displacement
- v_i: Velocity Initial
- v_f: Velocity Final

Energy

Gravitational Potential Energy

$$PE_{grav} = mass * gravity * height$$

Elastic Potential Energy

$$PE_{spring} = 0.5 * k * x^2$$

- k: Spring Compression
- x: Amount of stretch or compression (relative to equilibrium position)

Force for a Rubber Band

$$F_{\text{rubber band}} = k * x$$

Kinetic Energy

$$KE = 0.5 * mass * velocity^2$$