

MOTION

$$v = \frac{\Delta x}{\Delta t}$$

$$a = \frac{\Delta v}{\Delta t}$$

$$v = v_0 + a \Delta t$$

$$\Delta x = v_0 \Delta t + \frac{1}{2} a \Delta t^2$$

$$v^2 = v_0^2 + 2 a \Delta x$$

$$g = 9.8 \text{ m/s}^2$$

FORCE AND VECTORS:

Force Equations:

$$F = m a \quad F_F = \mu F_N$$

Momentum and Impulse:

$$p = m v \quad I = \Delta p = F \Delta t$$

ENERGY and POWER

Work and Power:

$$W = F_{\parallel} d \quad P = \frac{W}{\Delta t}$$

Energy:

$$KE_{\text{linear}} = \frac{1}{2} m v^2$$

$$PE_{\text{gravity}} = m g \Delta y$$

ELECTROSTATICS:

Coulomb's Law:

$$F_{1,2} = \frac{K Q_1 Q_2}{R^2}$$

$$K = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$$

Electric Field, Potential:

$$E = \frac{F}{q}$$

$$\Delta V = \frac{W}{q}$$

Elementary Charge:

$$e = 1.6 \times 10^{-19} \text{ C}$$

CIRCUITS:

Ohm's Law: Current

$$V = I R \quad I = \frac{\Delta Q}{\Delta t}$$

Power:

$$P = V I$$

WAVES:

Waves:

$$v = f \lambda \quad f = \frac{1}{T}$$

$$c = 3 \times 10^8 \text{ m/s}$$

OPTICS

Reflection:

$$\theta_I = \theta_R$$

Refraction:

$$n_1 v_1 = n_2 v_2$$

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$