

Uniformly accelerated motion: $speed = \frac{distance}{time}$

$$velocity = \frac{displacement}{time}$$

$$acceleration = \frac{change\ in\ velocity}{time}$$

Forces and moments:

$$\Sigma Force = mass * acceleration$$

$$Weight = mass * gravitational\ field\ strength$$

$$density = \frac{mass}{volume}$$

$$Force_{spring} = spring\ constant * extension$$

$$Moment = Force \times distance_{perpendicular} \text{ (measured from pivot point to force)}$$

Pressure:

$$Pressure = \frac{Force}{Area}$$

$$Pressure = density * gravitational\ field\ strength * height$$

$$Pressure_1 Volume_1 = Pressure_2 Volume_2$$

Energy, Work, Power: $gravitational\ potential\ energy = mass * gravitational\ field\ strength * height$

$$kinetic\ energy = \frac{1}{2} mass * velocity^2$$

$$Work = change\ in\ energy = Force \times distance_{parallel}$$

$$Power = \frac{Work}{time} = \frac{change\ in\ energy}{time}$$

$$efficiency = \frac{useful\ energy}{energy\ input} \times 100\% \quad \text{or} \quad efficiency = \frac{useful\ energy}{total\ energy} \times 100\%$$

Momentum:

$$momentum = mass * velocity$$

$$change\ in\ momentum = Force * time$$

Thermal Physics:

$$Energy = mass * specific\ heat\ capacity * change\ in\ temperature$$

$$Energy = mass * specific\ latent\ heat$$

Waves

$$velocity = frequency * wavelength$$

$$frequency = \frac{1}{period} = \frac{waves}{time}$$

$$period = \frac{1}{frequency} = \frac{time}{waves}$$

Refraction

$$index\ of\ refraction = \frac{speed\ of\ light\ in\ a\ vacuum}{velocity\ of\ the\ wave\ in\ the\ medium}$$

$$index\ of\ refraction = \frac{\sin(incident\ angle)}{\sin(refracted\ angle)}$$

$$index\ of\ refraction = \frac{1}{\sin(critical\ angle)}$$

Electricity

$$current = \frac{charge}{time}$$

*Voltage = Current * Resistance*

*Power = current * voltage*

R=Resistance, R_T=Total resistance

$$R_T = R_1 + R_2 + \dots$$

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$$

Magnetism

$$\frac{V_P}{V_S} = \frac{N_P}{N_S} = \frac{I_S}{I_P}$$

V=voltage, N=number of coils, I=current, P=primary, S=secondary