

Year 11 Physics Equation Sheet, Semester 1

Forces and Newton's Laws

$$\vec{F} = m\vec{a}$$

F = force

$$\vec{F}_1 = -\vec{F}_2$$

m = mass

a = acceleration

$$g = 9.8\text{ms}^{-2}$$

g = magnitude of acceleration due to gravity

Electricity and Magnetism:

$$P = \Delta VI$$

P = power

$$k = 9.00 \times 10^9 \text{Nm}^2\text{C}^{-2}$$

ΔV = potential difference

$$F = k \frac{q_1 q_2}{r^2}$$

I = current

k = electrostatic constant

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

q = magnitude of charge

$$E = k \frac{q}{r^2}$$

r = distance between charges

$$\Delta V = Ed$$

E = electric field strength

$$W = q\Delta V$$

d = distance between plates

$$\Delta V = IR$$

W = work done

Resistors in series:

$$R_T = R_1 + R_2$$

R = resistance

Resistors in parallel:

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

Δl = length of wire in magnetic field

B = magnetic field strength

$$F = I\Delta l B \sin \theta$$

θ = angle between current and magnetic field

Waves and Light:

$$v = f \lambda \quad v = \text{speed}$$

$$f = \text{frequency}$$

$$\lambda = \text{wavelength}$$

$$T = \frac{1}{f} \quad T = \text{period of oscillation}$$

$$n_1 \sin \theta_1 = n_2 \sin \theta_2 \quad n = \text{refractive index}$$
$$\theta = \text{angle from normal}$$

$$c = 3.00 \times 10^8 \text{ m} \quad c = \text{speed of light}$$

Refractive index list:

$$n_{\text{air}} = 1.00$$

$$n_{\text{water}} = 1.33$$

$$n_{\text{glass}} = 1.55$$

Standard prefixes:

$$\text{(M) mega} \quad \times 10^6$$

$$\text{(k) kilo} \quad \times 10^3$$

$$\text{(c) centi} \quad \times 10^{-2}$$

$$\text{(m) milli} \quad \times 10^{-3}$$

$$\text{(\mu) micro} \quad \times 10^{-6}$$

$$\text{(n) nano} \quad \times 10^{-9}$$