

A-Level Physics Formula List

Below is a list of the essential formulae not provided to students during A-Level physics examinations.

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

$$s = \frac{d}{t}$$

$$\text{force} = \text{mass} \times \text{acceleration}$$

$$F = ma$$

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

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

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

$$\rho = \frac{m}{V}$$

$$\text{momentum} = \text{mass} \times \text{velocity}$$

$$p = mv$$

$$\text{work done} = \text{force} \times \text{distance moved in} \\ \text{direction of force}$$

$$W = Fs$$

$$\text{power} = \frac{\text{energy transferred}}{\text{time taken}} = \frac{\text{work done}}{\text{time taken}}$$

$$P = \frac{W}{t}$$

$$\text{weight} = \text{mass} \times \text{gravitational field strength}$$

$$W = mg$$

$$\text{kinetic energy} = 1/2 \times \text{mass} \times \text{velocity}^2$$

$$E_k = 1/2 mv^2$$

$$\text{change in potential} = \text{mass} \times \text{gravitational field} \times \text{change in} \\ \text{energy} \qquad \qquad \qquad \text{strength} \qquad \qquad \qquad \text{height}$$

$$\Delta E_p = mg \Delta h$$

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

$$p = \frac{F}{A}$$

$$\text{pressure} \times \text{volume} = \text{number of} \times \text{molar gas} \times \text{absolute} \\ \text{moles} \qquad \qquad \qquad \text{constant} \qquad \qquad \text{temperature}$$

$$pV = nRT$$

$$\text{charge} = \text{current} \times \text{time}$$

$$q = It$$

$$\text{potential difference} = \text{current} \times \text{resistance}$$

$$V = IR$$

$$\text{electrical power} = \text{potential difference} \times \text{current}$$

$$P = VI$$

$$\text{potential difference} = \frac{\text{energy transferred}}{\text{charge}}$$

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

$$\text{resistance} = \frac{\text{resistivity} \times \text{length}}{\text{cross-sectional area}}$$

$$R = \frac{\rho l}{A}$$

$$\text{energy} = \text{potential difference} \times \text{current} \times \text{time}$$

$$E = V I t$$

$$\text{wave speed} = \text{frequency} \times \text{wavelength}$$

$$v = f \lambda$$

$$\text{centripetal force} = \frac{\text{mass} \times \text{velocity}^2}{\text{radius}}$$

$$F = \frac{mv^2}{r}$$

$$\text{capacitance} = \frac{\text{charge stored}}{\text{potential difference}}$$

$$C = \frac{q}{V}$$

$$\frac{\text{voltage across coil 1}}{\text{voltage across coil 2}} = \frac{\text{number turns coil 1}}{\text{number turns coil 2}}$$

$$\frac{V_1}{V_2} = \frac{N_1}{N_2}$$

$$\text{electrostatic force} = k \frac{q_1 q_2}{r^2}$$

$$\text{gravitational force} = \frac{G m_1 m_2}{r^2}$$