



Pearson Edexcel Level 3
Advanced Subsidiary
GCE in Physics (8PH0)

List of data, formulae and relationships

Issue 1
Summer 2016

P53451A

©2016 Pearson Education Ltd.

1/1/1

List of data, formulae and relationships

Acceleration of free fall	$g = 9.81 \text{ m s}^{-2}$	(close to Earth's surface)
Electron charge	$e = -1.60 \times 10^{-19} \text{ C}$	
Electron mass	$m_e = 9.11 \times 10^{-31} \text{ kg}$	
Electronvolt	$1 \text{ eV} = 1.60 \times 10^{-19} \text{ J}$	
Gravitational field strength	$g = 9.81 \text{ N kg}^{-1}$	(close to Earth's surface)
Planck constant	$h = 6.63 \times 10^{-34} \text{ J s}$	
Speed of light in a vacuum	$c = 3.00 \times 10^8 \text{ m s}^{-1}$	

Mechanics

Kinematic equations of motion	$s = \frac{(u + v)t}{2}$
	$v = u + at$
	$s = ut + \frac{1}{2}at^2$
	$v^2 = u^2 + 2as$

Forces	$\Sigma F = ma$
	$g = \frac{F}{m}$
	$W = mg$
	moment of force = Fx

Momentum	$p = mv$
----------	----------

Work, energy and power	$\Delta W = F\Delta s$
	$E_k = \frac{1}{2}mv^2$
	$\Delta E_{\text{grav}} = mg\Delta h$
	$P = \frac{E}{t}$
	$P = \frac{W}{t}$
	efficiency = $\frac{\text{useful energy output}}{\text{total energy input}}$
	efficiency = $\frac{\text{useful power output}}{\text{total power input}}$

Electric circuits

Potential difference $V = \frac{W}{Q}$

Resistance $R = \frac{V}{I}$

Electrical power and energy $P = VI$
 $P = I^2R$
 $P = \frac{V^2}{R}$

$$W = VI t$$

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

Current $I = \frac{\Delta Q}{\Delta t}$

$$I = nqvA$$

Materials

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

Stokes' law $F = 6\pi\eta r v$

Hooke's law $F = k\Delta x$

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

Young modulus Stress $\sigma = \frac{F}{A}$

$$\text{Strain } \varepsilon = \frac{\Delta x}{x}$$

$$E = \frac{\sigma}{\varepsilon}$$

Elastic strain energy $\Delta E_{\text{el}} = \frac{1}{2}F\Delta x$

Waves and Particle Nature of Light

Wave speed	$v = f\lambda$
Speed of a transverse wave on a string	$v = \sqrt{\frac{T}{\mu}}$
Intensity of radiation	$I = \frac{P}{A}$
Power of a lens	$P = \frac{1}{f}$
	$P = P_1 + P_2 + P_3 + \dots$
Thin lens equation	$\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$
Magnification for a lens	$m = \frac{\text{image height}}{\text{object height}} = \frac{v}{u}$
Diffraction grating	$n\lambda = d \sin \theta$
Refractive index	$n_1 \sin \theta_1 = n_2 \sin \theta_2$
	$n = \frac{c}{v}$
Critical angle	$\sin C = \frac{1}{n}$
Photon model	$E = hf$
Einstein's photoelectric equation	$hf = \phi + \frac{1}{2}mv_{\text{max}}^2$
de Broglie wavelength	$\lambda = \frac{h}{p}$