Equation Sheet

GCSE (9–1) Physics B
(Twenty First Century Science)
J259/01, J259/02, J259/03, J259/04

The information in this sheet is for the use of candidates following GCSE (9–1)

Physics B (J259/01, J259/02, J259/03, J259/04).

A copy of this sheet will be provided as an insert within the question paper for each component.

Copies of this sheet may be used for teaching.

Equations in physics

potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil	$V_p\, I_p = V_s\, I_s$
(final speed)^2 − (initial speed)^2 = 2 × acceleration × distance	$v^2 - u^2 = 2\,a\,s$
change in internal energy = mass × specific heat capacity × change in temperature	$\Delta E = m\,c\,\Delta\theta$
energy to cause a change of state = mass × specific latent heat	$E = m\,l$
energy stored in a stretched spring = $\frac{1}{2}$ × spring constant × (extension)^2	$E = \frac{1}{2}\,k\,x^2$
for a given mass of gas at a constant temperature: pressure × volume = constant	$p\,V$ = constant

Higher tier only

force = magnetic flux density × current × length of conductor	$F = B\,I\,l$
$\dfrac{\text{potential difference across primary coil}}{\text{potential difference across secondary coil}} = \dfrac{\text{number of turns in primary coil}}{\text{number of turns in secondary coil}}$	$\dfrac{V_p}{V_s} = \dfrac{N_p}{N_s}$
change in momentum = resultant force × time for which it acts	$\Delta p = F\,t$
pressure = density × gravitational field strength × depth	$p = \rho\,g\,h$

Summary of updates

Date	Version	Details
May 2022	2.0	Data Sheet changed to Equation Sheet. Word equations are presented in a table with the symbol equations. Wording of formula for fluid pressure amended to match specification statement P6.4.8. Reformatted some word equations to improve readability and consistency: • 0.5 is now represented as $\frac{1}{2}$ • division in word equations is represented with a horizontal fraction bar • clearer separation of introductory statement from the subject of the equation • 'g' in word equation replaced with 'gravitational field strength'
May 2023	2.1	Watermark removed