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Physics Equations Sheet

GCSE Physics (8463)

FOR USE IN JUNE 2023 ONLY

[Turn over]

HT = Higher Tier only equations

kinetic energy = $0.5 \times \text{mass} \times (\text{speed})^2$	$E_k = \frac{1}{2} m v^2$
elastic potential energy = $0.5 \times \text{spring constant} \times (\text{extension})^2$	$E_e = \frac{1}{2} k e^2$
gravitational potential energy = mass \times gravitational field strength \times height	$E_p = m g h$
change in thermal energy = mass \times specific heat capacity \times temperature change	$\Delta E = m c \Delta \theta$
power = $\frac{\text{energy transferred}}{\text{time}}$	$P = \frac{E}{t}$
power = $\frac{\text{work done}}{\text{time}}$	$P = \frac{W}{t}$
efficiency = $\frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$	

efficiency = $\frac{\text{useful power output}}{\text{total power input}}$	
charge flow = current \times time	$Q = I t$
potential difference = current \times resistance	$V = I R$
power = potential difference \times current	$P = V I$
power = (current)² \times resistance	$P = I^2 R$
energy transferred = power \times time	$E = P t$
energy transferred = charge flow \times potential difference	$E = Q V$
density = $\frac{\text{mass}}{\text{volume}}$	$\rho = \frac{m}{V}$
thermal energy for a change of state = mass \times specific latent heat	$E = m L$

[Turn over]

For gases: pressure × volume = constant	$p V = \text{constant}$
weight = mass × gravitational field strength	$W = m g$
work done = force × distance (along the line of action of the force)	$W = F s$
force = spring constant × extension	$F = k e$
moment of a force = force × distance (normal to direction of force)	$M = F d$
pressure = $\frac{\text{force normal to a surface}}{\text{area of that surface}}$	$p = \frac{F}{A}$
pressure due to a column of liquid = height of column × density of liquid × gravitational field strength	$p = h \rho g$
distance travelled = speed × time	$s = v t$
acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$	$a = \frac{\Delta v}{t}$

	$v^2 - u^2 = 2 a s$
	$F = m a$
HT	$p = m v$
	$F = \frac{m \Delta v}{\Delta t}$
HT	$T = \frac{1}{f}$
	$v = f \lambda$
HT	$F = B I l$

[Turn over]

<p>HT</p> <p>$\frac{\text{potential difference across primary coil}}{\text{potential difference across secondary coil}} = \frac{\text{number of turns in primary coil}}{\text{number of turns in secondary coil}}$</p>	$\frac{V_p}{V_s} = \frac{n_p}{n_s}$
<p>HT</p> <p>potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil</p>	$V_p I_p = V_s I_s$

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