

Physics equations to memorise

Exam	Word equation	Symbol equation	SI unit
Paper 1	kinetic energy = $0.5 \times \text{mass} \times (\text{speed})^2$	$E_k = \frac{1}{2} m v^2$	Kinetic energy = joules (J) Mass = kilograms (kg) Speed = metres per second (m/s)
Paper 1	gravitational potential energy = mass $\times$ gravitational field strength $\times$ height	$E_p = m g h$	GPE = joules (J) Mass = kilograms (kg) g = newtons per kilogram (N/kg) Height = metres (m)
Paper 1	power = $\frac{\text{energy transferred}}{\text{time}}$	$P = E/t$	Power = watts (W) Energy = joules (J) Time = seconds (s)
Paper 1	power = $\frac{\text{work done}}{\text{time}}$	$P = W/t$	Power = watts (W) Work done = joules (J) Time = seconds (s)
Paper 1	efficiency = $\frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$		
Paper 1	efficiency = $\frac{\text{useful power output}}{\text{total power input}}$		
Paper 1	charge flow = current $\times$ time	$Q = I t$	Charge flow = coulombs (C) Current = amperes (A) Time = seconds (s)
Paper 1	potential difference = current $\times$ resistance	$V = I R$	Potential difference = volts (V) Current = amperes (A) Resistance = ohms (Ω)
Paper 1	power = potential difference $\times$ current	$P = V I$	Power = watts (W) Potential difference = volts (V) Current = amperes (A)
Paper 1	power = (current) $^2 \times$ resistance	$P = I^2 R$	Power = watts (W) Current = amperes (A) Resistance = ohms (Ω)
Paper 1	energy transferred = power $\times$ time	$E = P t$	Energy = joules (J) Power = watts (W) Time = seconds (s)

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Paper 1	energy transferred = charge flow $\times$ potential difference	$E = Q V$	Energy = joules (J) Charge flow = coulombs (C) Potential difference = volts (V)
Paper 1	density = $\frac{\text{mass}}{\text{volume}}$	$\rho = m / V$	Density = kilograms per metre cubed (kg/m ³) Mass = kilograms (kg) Volume = metres cubed (m ³)
Paper 2	weight = mass $\times$ gravitational field strength (g)	$W = m g$	Weight = newtons (N) Mass = kilograms (kg) g = newtons per kilogram (N/kg)
Paper 2	work done = force $\times$ distance (along the line of action of the force)	$W = F s$	Work done = joules (J) Force = newtons (N) Distance = metres (m)
Paper 2	force applied to a spring = spring constant $\times$ extension	$F = k e$	Force = newtons (N) Spring constant = newtons per metre (N/m) Extension = metres (m)
Paper 2 TRIPLE ONLY	moment of a force = force $\times$ distance (normal to direction of force)	$M = F d$	Moment = newton-metres (Nm) Force = newtons (N) Distance = metres (m)
Paper 2 TRIPLE ONLY	pressure = $\frac{\text{force normal to a surface}}{\text{area of that surface}}$	$p = F/A$	Pressure = pascals (Pa) Force = newtons (N) Area = metres squared (m²)
Paper 2	distance travelled = speed $\times$ time	$s = v t$	Distance = metres (m) Speed = metres per second (m/s) Time = seconds (s)
Paper 2	acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$	$a = \Delta v / t$	Acceleration = metres per second squared (m/s ²) Velocity = metres per second (m/s) Time = seconds (s)
Paper 2	resultant force = mass $\times$ acceleration	$F = m a$	Force = newtons (N) Mass = kilograms (kg) Acceleration = metres per second squared (m/s ²)
Paper 2 - (HT)	momentum = mass $\times$ velocity	$p = m v$	Momentum = kilogram metres per second (kg m/s) Mass = kilograms (kg) Velocity = metres per second (m/s)
Paper 2	wave speed = frequency $\times$ wavelength	$v = f \lambda$	Wave speed = metres per second (m/s) Frequency = hertz (Hz) Wavelength = metres (m)