**Physics equations**

These are NOT on the data sheet!

**Top tip: You need to be able to recall and apply the equations - don’t worry you will have plenty of practice!!!**

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| --- | --- | --- | --- | --- |
| **Unit**  | **Equation number**  | **Equation**  | **Units ( You need to remember these too)** |  |
| **P5** | **1** | **W = mg** | **W = weight (N = Newtons)****m = mass (kg = kilograms)****g = gravitational field strength (N/kg)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P5** | **2** | **W = Fs** | **W = Work done (J = Joules)****F = Force (N)****s= distance (m = metres)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P5** | **3** | **F = ke** | **F = Force (N)****k = spring constant (N/m)****e= extension (m)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P5** | **4 (PHYS Only)** | **M= F d**  | **F = Force (N)****M= Moment of a force (Nm)****d= distance (perpendicular to direction of force) (m)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P5** | **5 (PHYS Only)** | $$P= \frac{F}{A}$$ | **P = Pressure (N/m2)****F = Force (N)****A= area (m2)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P5** | **6** | **s = vt** | **S = distance travelled (m)****v = speed (m/s)****t = Time (s = seconds)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P5** | **7** | $$a=\frac{∆v}{t}$$ | **a = acceleration (m/s2)****Δ v = change in velocity (m/s)****t = Time (s)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P5** | **8** | **F= ma** | **F = Force ( N)****m = mass (kg)****a = acceleration (m/s2)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P5** | **9 HT**  | **p = mv** | **m = mass (kg)****p= momentum (kgm/s)****v = velocity (m/s)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P1** | **10** | **Ek=½ mv2** | **Ek = Kinetic energy (J)****m = mass (kg)****v = velocity (m/s)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P1** | **11** | **Ep = mgh** | **Ep = Gravitational Potential energy (J)****m = mass (kg)****g = gravitational field strength (N/kg)****h = height (m)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P1** | **12** | $$P= \frac{E}{t}$$ | **P = Power (W = Watts) so effectively 12 and 13 are the****E = Energy transferred (J) same because****t = Time (s) work done = Energy transferred** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P1** | **13** | $$P= \frac{W}{t}$$ | **P = Power (W)****W = Work done (J)****t = Time (s)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P1** | **14** | **Efficiency** $\frac{useful output energy transfer (J)}{total input energy transfer (J)}$ | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P1** | **15** | **Efficiency =** $\frac{useful power output (W)}{total power input (W)}$**so effectively 14 and 15 are the same, use either energy or power** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P6** | **16** | **V = fλ** | **v = wave speed (m/s)****f = frequency (Hz = Hertz)****λ = wavelength (m)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P2** | **17** | **Q = I t** | **I = Current (A = Amps)****Q = Charge flow (C = Coulombs)****t = Time (s)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P2** | **18** | **V = I R** | **V = Potential difference (V = Volts)****I = Current (A)****R = Resistance (Ω = Ohms)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P2** | **19** | **P = I V** | **P = Power (W)****I = Current (A)****V = Potential difference (V)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P2** | **20** | **P = I2 R** | **P= Power (W)****I = Current (A)****R = Resistance (Ω)** | **I can use different units**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P2** | **21** | **E = P t** | **P= Power (W)****E= Energy transferred (J)** **t = Time (s)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P2** | **22** | **E = V Q** | **E= Energy transferred (J)****V =Potential difference (V)****Q = Charge flow (C)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |
| **P3** | **23** | $$ρ=\frac{m}{V}$$ | $ρ$ **= density (kg/m3)****m = mass (kg)****V= volume (m3)** | **I can use the equation**  |
| **I can re –arrange the equation**  |
| **I can use different units**  |