ANNOTATED N5 RELATIONSHIPS SHEET

Equation	
$d = vt$	$distance\ (m) = speed\ (m\ s^{-1}) \times time\ (s)$
$d = \bar{v}t$	$total\ distance\ (m) = average\ speed\ (m\ s^{-1}) \times\ time\ (s)$
$s = vt$	$displacement\ (m) = velocity\ (m\ s^{-1}) \times time\ (s)$
$s = \bar{v}t$	$total\ displacement\ (m) = average\ velocity\ (m\ s^{-1}) \times time\ (s)$
$a = \frac{v-u}{t}$	$acceleration\ (m\ s^{-2}) = \frac{final\ velocity\ (m\ s^{-1}) - initial\ velocity\ (m\ s^{-1})}{time\ (s)}$
$F = ma$	$force\ (N) = mass\ (kg) \times acceleration\ (m\ s^{-2})$
$W = mg$	$weight\ (N) = mass\ (kg) \times gravitational\ field\ strength (N\ kg^{-1})$
$E_w = Fd$	$work\ done\ (J) = force\ (N) \times distance\ (m)$
$E_p = mgh$	$gravitational\ potential\ energy\ (J) = mass\ (kg) \times gravitational\ field\ strength (N\ kg^{-1}) \times vertical\ height\ (m)$
$E_k = \frac{1}{2}mv^2$	$kinetic\ energy\ (J) = \frac{1}{2} \times mass\ (kg) \times speed^2\ \ (m\ s^{-1})^2$
$Q = It$	$charge\ (C) = current\ (A) \times\ time\ (s)$
$V = IR$	$voltage\ (V) = current\ (A) \times resistance\ (\Omega)$
$V_2 = \left(\frac{R_2}{R_1 + R_2}\right) V_s$	**For potential dividers:** $voltage\ across\ second\ series\ resistor\ (V) = \frac{resistance\ of\ R_2\ (\Omega)}{\text{total resistance}\ (\Omega)} \times voltage\ supply\ (V)$
$\frac{V_1}{V_2} = \frac{R_1}{R_2}$	$\frac{voltage\ 1\ (V)}{voltage\ 2\ (V)} = \frac{resistance\ 1\ (\Omega)}{resistance\ 2\ (\Omega)}$
$R_T = R_1 + R_2 + ..$	**For resistors in series:** $total\ resistance\ (\Omega) = resistance\ of\ R_1 (\Omega) + resistance\ of\ R_2 (\Omega) + ..$
$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2}$	**For resistors in parallel** $\frac{1}{total\ resistance\ (\Omega)} = \frac{1}{resistance\ of\ R_1\ (\Omega)} + \frac{1}{resistance\ of\ R_2\ (\Omega)} + \cdots$
$P = \frac{E}{t}$	$power\ (W) = \frac{energy\ (J)}{time\ (s)}$
$P = IV$	$power\ (W) = current\ (A) \times voltage\ (V)$
$P = I^2R$	$power\ (W) = current\ ^2 (A)^2 \times resistance\ (\Omega)$
$P = \frac{V^2}{R}$	$power\ (W) = \frac{voltage^2\ (V)^2}{resistance\ (\Omega)}$

Equation	
$E_h = cm\Delta T$	$heat\ energy\ (J) = Specific\ heat\ capacity\ (Jkg^{-1}\ ℃^{-1}\ or Jkg^{-1}K^{-1}) \times mass\ (kg) \times change\ in\ temperature$ (°C) **Find the value of c on the data sheet**
$E_h = ml$	$heat\ energy\ (J) = mass\ (kg) \times specific\ latent\ heat\ (Jkg^{-1})$ **Find the value of l on the data sheet** **NB there is no change in temperature just state**
$p = \frac{F}{A}$	$pressure\ (Pa) = \frac{Force\ (N)}{Area\ (m^2)}$
$p_1V_1 = p_2V_2$	$pressure_1(Pa) \times volume_1(m^3) = Pressure_2(Pa) \times volume_2(m^3)$
$\frac{p_1}{T_1} = \frac{p_2}{T_2}$	$\frac{pressure_1(Pa)}{Temperature_1(K)} = \frac{Pressure_2(Pa)}{Temperature_2(K)}$ **Temp MUST be in Kelvin**
$\frac{V_1}{T_1} = \frac{V_2}{T_2}$	$\frac{volume_1(m^3)}{Temperature_1(K)} = \frac{volume_2(m^3)}{Temperature_2(K)}$ **Temp MUST be in Kelvin**
$\frac{pV}{T} = constant$	$\frac{Pressure(Pa) \times volume(m^3)}{Temperature\ (K)} = constant\ value$
$f = \frac{N}{t}$	$Frequency\ (Hz) = \frac{No.of\ waves\ produced\ or\ passing\ a\ point\ (no\ units)}{time(s)}$
$v = f\lambda$	$wave\ speed\ (m\ s^{-1}) = Frequency\ (Hz) \times wavelength\ (m)$
$T = \frac{1}{f}$	$Period\ (s) = \frac{1}{Frequency(Hz)}$
$A = \frac{N}{t}$	$Activity\ (Bq) = \frac{No.of\ disintegrations\ (no\ units)}{time(s)}$
$D = \frac{E}{m}$	$Absorbed\ Dose\ (Gy) = \frac{Energy\ (J)}{mass\ (kg)}$
$H = Dw_R$	$Equivalent\ Dose\ (Sv) = Absorbed\ Dose\ (Gy) \times radiation\ weighting\ factor(no\ units)$
$\dot{H} = \frac{H}{t}$	$Equivalent\ Dose\ rate\ (Svh^{-1}\ or\ Svy^{-1}) = \frac{Equivalent\ Dose\ (Sv)}{time\ (s\ or\ h\ or\ y)}$