

Formulae- Rearranging and Substituting

- 1) Rearrange these formula to express the specified variable in terms of the other variables.
Here is an example: $v = u + at$ rearranged to express t in terms of v, u and a

$$\begin{aligned} & v = u + at \\ -u \rightarrow & v - u = at \\ \div a \rightarrow & \frac{v-u}{a} = t \end{aligned}$$

- If $y = 5x - 2$, express x in terms of y
 - If $a = bc + d$, express c in terms of a, b and d
 - If $h = \frac{d-k}{5}$, express d in terms of h and k
 - If $f = \frac{9}{5}c + 32$, express c in terms of f
 - If $s = \frac{u+v}{2} \times t$ express t in terms of s, u and v
- 2) Evaluate these formulae by substituting the given values.
Here is an example: if $v = u + at$, find v when $u = 10, a = 5$ and $t = 2$

$$\begin{aligned} v &= 10 + 5 \times 2 \\ &= 10 + 10 \\ &= 20 \end{aligned}$$

- If $y = 5x - 2$, find y when $x = 2$
 - If $a = bc + d$, find a when $b = 10, c = 5$ and $d = 12$
 - If $h = \frac{d-k}{5}$, find h when $d = 1.4$ and $k = 0.2$
 - If $f = \frac{9}{5}c + 32$, find f when $c = 25$
(This converts 25° centigrade into Fahrenheit.)
 - If $s = ut + \frac{gt^2}{2}$, find s when $u = 0, g = 9.81$ and $t = 10$
(This calculates how far an object falls in 10 seconds if it is dropped. g , the acceleration due to gravity, is given in metres/sec² so the answer is in metres.)
- 3) If $P = \frac{V^2}{R}$, calculate V when $P = 25$ and $R = 4$
(This formula gives the power in watts in a DC electrical circuit when V volts is applied to a resistance of R ohms.)
- 4) If $t_2 = \frac{t_1}{\sqrt{1-\frac{v^2}{c^2}}}$ calculate t_2 when $t_1 = 2\,500, v = 5.00 \times 10^4$ and $c = 3.00 \times 10^8$
(This formula calculates the time dilation effect in special relativity. v is the relative velocity and c is the speed of light.)