

Engineering – Cambridge Technical Extended Certificate

These are to be completed before your first Engineering lesson in September. You will need your answers in that first lesson, so don't forget to bring them in with you!

3.1 Rearrange the following equations to make the variable in brackets the subject:

- | | | | |
|---------------|---------|--------------------|---------------|
| (a) $p = mv$ | (m) | (f) $M = Fd$ | (d) |
| (b) $Q = It$ | (I) | (g) $V/R = I$ | (R) |
| (c) $v = s/t$ | (s) | (h) $P/I = V$ | (P) |
| (d) $F = ma$ | (a) | (i) $v = f\lambda$ | (λ) |
| (e) $W = mg$ | (m) | (j) $\rho = m/V$ | (V) |

3.2 Rearrange the following equations to make the variable in brackets the subject:

- | | |
|-------------------------|-----------|
| (a) $E = mgh$ | (m) |
| (b) $P_1V_1 = P_2V_2$ | (P_2) |
| (c) $v^2 = u^2 + 2as$ | (a) |
| (d) $\sin(c) = 1/n$ | (n) |
| (e) $V_p/V_s = N_p/N_s$ | (N_s) |

3.3 Make v the subject of the following equation:

$$E = \frac{1}{2}mv^2$$

3.4 If $u = 0$, make t the subject of the following equation:

$$s = ut + \frac{1}{2}at^2$$

3.5 Make $\sin(r)$ the subject of the following equation:

$$n = \frac{\sin(i)}{\sin(r)}$$

3.6 Make x the subject of the following equation:

$$10(x + y) = 5(x - y)$$

3.7 Make λ the subject of the following equation:

$$t = k/\lambda$$

3.8 Make r the subject of the following equation:

$$F = \frac{kQ_1Q_2}{r^2}$$

3.9 Make T the subject of the following equation:

$$r \left(\frac{2\pi}{T} \right)^2 = \frac{GM}{r^2}$$