

### Assessment Specifications for Level 3 Physics

“Candidates should show their reasoning clearly and may use numerical working, words, and/or diagrams.

Mathematical solutions at the Excellence level will require candidates to show, mathematically, how two phenomena, concepts, or principles are interconnected.

For calculations involving “g”, the value will be given as,  $g = 9.81 \text{ N kg}^{-1} (\text{m s}^{-2})$ .

It is recommended that candidates use standard form in writing numerical answers. The number of significant figures in any answer should be clear and should be consistent with the data in the question.

Answers should be given with an appropriate unit. SI units should be used unless it is more appropriate to include a prefix (milli, kilo, etc).”

### Mechanics Formulae

The formulae on the equation sheet are always given in a particular order:

linear motion (A), angular motion (B), forces etc... (C), SHM (D)

<b>A</b>	$F = ma$ $W = Fd$	$p = mv$ $E_{\text{K(LIN)}} = \frac{1}{2}mv^2$	$\Delta p = F\Delta t$ $x_{\text{COM}} = \frac{m_1x_1 + m_2x_2}{m_1 + m_2}$	$\Delta E_p = mg\Delta h$
<b>B</b>	$d = r\theta$ $\alpha = \frac{\Delta\omega}{\Delta t}$ $\omega_f = \omega_i + \alpha t$	$v = r\omega$ $\omega = 2\pi f$ $\theta = \frac{\omega_f + \omega_i}{2}t$	$a = r\alpha$ $f = \frac{1}{T}$ $\omega_f^2 = \omega_i^2 + 2\alpha\theta$	$\omega = \frac{\Delta\theta}{\Delta t}$ $E_{\text{K(ROT)}} = \frac{1}{2}I\omega^2$ $\theta = \omega_i t + \frac{1}{2}\alpha t^2$
<b>C</b>	$\tau = I\alpha$ $F_g = \frac{GMm}{r^2}$	$\tau = Fr$ $F_c = \frac{mv^2}{r}$	$L = mvr$	$L = I\omega$
<b>D</b>	$F = -ky$ $y = A\sin\omega t$ $y = A\cos\omega t$	$E_p = \frac{1}{2}ky^2$ $v = A\omega\cos\omega t$ $v = -A\omega\sin\omega t$	$T = 2\pi\sqrt{\frac{l}{g}}$ $a = -A\omega^2\sin\omega t$ $a = -A\omega^2\cos\omega t$	$T = 2\pi\sqrt{\frac{m}{k}}$ $a = -\omega^2y$

