

## Physics 12 Formulas

$$F_{\text{net}} = ma$$

$$F_g = mg$$

$$\tau = Fr_{\perp}$$

$$m_a v_a + m_b v_b = (m_a + m_b) v'$$

$$F_c = ma_c$$

$$v = r\omega$$

$$\tan \theta = \frac{v^2}{rg}$$

$$E_k + E_g + E_c = E_k' + E_g' + E_c'$$

$$W = E_f - E_i$$

$$E_g = mgh$$

$$y = y_o + v_{yo}t + \frac{1}{2}gt^2$$

$$v_y = v_{yo} + gt$$

$$v_x = v_{xo} + at$$

$$R = \frac{-v_o^2 \sin 2\theta}{g}$$

$$T = \frac{-2v_o \sin \theta}{g}$$

$$T = t/N$$

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

$$F_f = \mu F_N$$

$$F = kx$$

$$m_a v_a + m_b v_b = m_a v_a' + m_b v_b'$$

$$(m_a + m_b)v = m_a v_a' + m_b v_b'$$

$$a_c = v^2/r$$

$$a_c = r\omega^2$$

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

$$W = Fd$$

$$E_c = \frac{1}{2}kx^2$$

$$x = x_o + v_x t$$

$$v_y^2 = v_{yo}^2 + 2g(y - y_o)$$

$$v_x^2 = v_{xo}^2 + 2a(x - x_o)$$

$$H = \frac{-v_o^2 \sin^2 \theta}{2g}$$

$$v = \frac{2\pi r}{T}$$

$$F_{\perp} = mg \cos \theta$$

### Electricity – Not used on the exam

$$V = \frac{E_q}{q}$$

$$I = \frac{q}{t}$$

$$R = \frac{\rho L}{A}$$

$$V = IR$$

$$P = IV$$

$$P = I^2 R$$

$$P = \frac{V^2}{R}$$

$$E_q = Pt$$

$$\text{Cost} = \text{rate} \times E_q$$

$$F_Q = \frac{kq_1 q_2}{r^2}$$

$$E = \frac{E_Q}{q}$$

$$g = \frac{E_g}{m}$$

$$E = \frac{kq}{r^2}$$

$$g = \frac{Gm}{r^2}$$

$$F_g = \frac{GMm}{r^2}$$

$$k = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$$

$$G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$$