

Equations from Section 1: Velocity and Acceleration

Linear motion:

$$v = u + at$$

Equation 1.1

$$s = \frac{(u + v)}{2}t$$

Equation 1.2

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

Equation 1.3

$$v^2 = u^2 + 2as$$

Equation 1.4

Angular speed

$$\omega = \frac{d\theta}{dt}$$

Equation 1.5

Angular acceleration

$$\alpha = \frac{d\omega}{dt}$$

Equation 1.6

Constant angular acceleration

$$\alpha = \frac{\omega_2 - \omega_1}{t}$$

Equation 1.7

Relationship between linear and a

$$\omega = \frac{\theta}{t}$$

Equation 1.8

$$v = \frac{r\theta}{t}$$

Equation 1.9

$$v = r\omega$$

Equation 1.10

$$\omega = 2\pi n$$

Equation 1.11

$$a = r\alpha$$

Equation 1.12

Uniform circular motion

$$a = \frac{v^2}{r}$$

Equation 1.13

Equations from Section 2: Mass, Force and Acceleration

Momentum

$$p = mv$$

Equation 2.1

Newtons 2nd law

$$F = ma$$

Equation 2.2

Weight

$$W = mg$$

Equation 2.3

Connected masses

$$m_1g - T = m_1a$$

Equation 2.4

$$T - m_2g = m_2a$$

Equati

Friction

$$F_s = \mu_s N$$

Equation 2.6

$$F = \mu N$$

Equation 2.7

Circular motion

$$F = ma = \frac{mv^2}{r}$$

Equation 2.8

$$2R \cos \theta = mg$$

Equation 2.9

$$\frac{mv^2}{r} = 2R \sin \theta$$

Equation 2.10

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

Equation 2.11

Equations from Section 3: Work, Power and Energy

Work, Energy, Power

$$\text{Work done} = F s \cos \theta \quad \text{Equation 3.1}$$

$$\text{work done} = \text{area under force/distance curve} \quad \text{Equation 3.2}$$

$$\text{potential energy} = mgh \quad \text{Equation 3.3}$$

$$\text{kinetic energy} = \frac{1}{2}mv^2 \quad \text{Equation 3.4}$$

$$\text{Work done by forces acting on a body} = \text{change of kinetic energy in the body} \quad \text{Equation 3.5}$$

$$\text{Power} = \frac{\text{work done}}{\text{time taken}} \quad \text{Equation 3.6}$$

$$\text{Power} = Fv \quad \text{Equation 3.7}$$

Moments forces and torques

$$\text{moment} = Fd \quad \text{Equation 3.8}$$

$$\text{Moment of couple} = Fp \quad \text{Equation 3.9}$$

$$T_Q = Fr \quad \text{Equation 3.10}$$

$$\text{work done} = Fr\theta = T_Q\theta \quad \text{Equation 3.11}$$

$$\text{power} = 2\pi nT_Q = \omega T_Q \quad \text{Equation 3.12}$$

$$\text{work done} = \text{area under torque/angular displacement graph} \quad \text{Equation 3.13}$$