

Force

$$F = ma$$

$$\text{Moment} = F \times \text{perpendicular distance}$$

$$\text{Torque} = F \times r$$

Aircraft centre of gravity

$$\bar{x} = \frac{(R_a \times a) + (R_b \times b) + (R_c \times c)}{(R_a + R_b + R_c)}$$

Pressure

$$P = \frac{F}{A} \quad P = \rho gh$$

Combined Gas Law

$$\frac{p_1 V_1}{T_1} = \frac{p_2 V_2}{T_2}$$

Density

$$\rho = \frac{m}{V} \quad \text{Density of water} = 1000 \text{ kg/m}^3$$

Equations of linear motion

$$v = u + at \quad s = ut + \frac{1}{2} at^2 \quad s = \frac{1}{2} (u + v) t \quad v^2 = u^2 + 2as$$

Equations of angular motion

$$v = \omega r \quad F = m\omega^2 r \quad F = \frac{mv^2}{r} \quad a = \omega^2 r \quad a = \frac{v^2}{r}$$

Frequency and Periodic Time

$$f = \frac{1}{T} \quad T = \frac{1}{f}$$

$$T = 2\pi \sqrt{\frac{l}{g}}$$

Simple machines

$$MA = \frac{\text{Load}}{\text{Effort}}$$

$$VR = \frac{s_E}{s_L}$$

$$\text{Efficiency } (\eta) = \frac{MA}{VR}$$

$$VR(\text{gears}) = \frac{\text{input speed}}{\text{output speed}} = \frac{\text{product of driven teeth}}{\text{product of driver teeth}}$$

Energy

$$\text{Work done} = Fs$$

$$\text{Power} = \frac{\text{Work done}}{\text{Time}}$$

$$PE = mgh$$

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

Friction

$$F_f = \mu N$$

Temperature

$$^{\circ}F = (^{\circ}C \times \frac{9}{5}) + 32$$

$$^{\circ}C = (^{\circ}F - 32) \times \frac{5}{9}$$

$$K = ^{\circ}C + 273.15$$

Latent Heat values

<u>Material</u>	<u>Latent Heat of Fusion</u>	<u>Latent Heat of Vaporisation</u>
Aluminium	386,790 J/kg	10,800,000 J/kg
Lead	26,204 J/kg	862,000 J/kg
Tin	61,116 J/kg	2,497,000 J/kg
Iron	267,000 J/kg	6,095,000 J/kg
Ice/water	336,000 J/kg	2,260,000 J/kg
Silicon	1,650,000 J/kg	13,700,000 J/kg