

FORMULAE SHEET

Force, Moments

$$F = ma; \quad M = Fd$$

If a body is in equilibrium, then $\sum F_x = 0; \quad \sum F_y = 0; \quad \sum M = 0$

Friction

$$F = \mu N; \quad \mu = \tan \phi$$

Energy, Work, Power

$$KE = \frac{1}{2}mv^2; \quad PE = mgh; \quad W = Fs = \Delta PE + \Delta KE; \quad P = \frac{W}{t}$$

Pressure

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

Stress and Strain

$$\sigma = \frac{F}{A}; \quad \epsilon = \frac{e}{L}; \quad E = \frac{\sigma}{\epsilon}; \quad \sigma = \frac{My}{I}$$

$$\sigma_{\text{allowable}} = \frac{\sigma_{\text{yield}}}{F \text{ of } S} \text{ (Ductile);} \quad \sigma_{\text{allowable}} = \frac{\sigma_{\text{UTS}}}{F \text{ of } S} \text{ (Brittle)}$$

Machines

$$MA = \frac{L}{E}; \quad VR = \frac{d_E}{d_L}; \quad \eta = \frac{MA}{VR}$$