

## Some Important Formulas, Constants and Conversion Factors

$$KE_1 + PE_1 + W_{1-2} = KE_2 + PE_2$$

$$KE_1 = \frac{1}{2}mv_1^2, \text{ newton} \cdot \text{meters} \left( \frac{\text{kg} \cdot \text{m}}{\text{sec}^2} \cdot \text{m} \right)$$

$$PE_3 = mgh_3, \text{ newton} \cdot \text{meters} \left( \frac{\text{kg} \cdot \text{m}}{\text{sec}^2} \cdot \text{m} \right)$$

$$F = m \cdot a, \text{ newtons} \left( \frac{\text{kg} \cdot \text{m}}{\text{sec}^2} \right)$$

$$W = F \cdot d, \text{ newton} \cdot \text{meters}, \text{ joules}$$

$$P = \frac{W}{t}, \frac{\text{newton} \cdot \text{meters}}{\text{sec}}, \frac{\text{joules}}{\text{sec}}$$

$$\frac{P_{\text{output needed}}}{P_{\text{input}}} = \text{Efficiency (Usually expressed as \%)}$$

$$a_{\text{centripetal}} = \frac{v^2}{r}, \frac{\text{meters}}{\text{sec}^2}$$

$$\text{Chairforce: } CF = m \cdot a_{\text{centripetal}}, \text{ newton} \cdot \text{meters}$$

$$\#g's \text{ felt} = \frac{\text{acceleration felt}}{\text{acceleration of gravity}}, \text{ No units}$$

$$\text{Force Factor: } FF = \frac{CF}{\text{weight}} = \frac{v^2}{r \cdot g} \pm 1, \text{ No units}$$

$$d = v \cdot t, \text{ meters}$$

$$g = 9.8 \frac{\text{m}}{\text{sec}^2} = 32.2 \frac{\text{ft}}{\text{sec}^2}$$

$$1 \text{ kw} = 1000 \frac{\text{joules}}{\text{sec}}$$

$$1.34 \text{ hp} = 1 \text{ kw}$$

$$2.2 \text{ lb} = 1 \text{ kg}$$

$$2.2 \frac{\text{mi}}{\text{hr}} = 1 \frac{\text{m}}{\text{sec}}$$

$$1 \text{ yd} = 3 \text{ ft} = 0.914 \text{ m}$$