

Chapter 7 Section 1 Pg 236

Sample Problem B

$$v_t = 56.6 \text{ m/s}$$

$$r = 188.5 \text{ m}$$

$$F_c = 1.89 \times 10^4 \text{ N}$$

$$m = ?$$

$$F_c = \frac{mv_t^2}{r}$$

$$F_c r = mv_t^2$$

$$m = \frac{F_c r}{v_t^2}$$

$$m = \frac{(1.89 \times 10^4 \text{ N})(188.5 \text{ m})}{(56.6 \text{ m/s})^2}$$

$$m = \frac{3562650 \text{ N} \cdot \text{m}}{3203.56 \text{ m}^2/\text{s}^2}$$

$$m = 1110 \frac{\text{kg} \cdot \text{m}}{\text{s}^2} \cdot \frac{\text{s}^2}{\text{m}^2} \cdot \text{m}$$

$$\frac{\text{kg} \cdot \cancel{\text{m}}}{\cancel{\text{s}^2}} \times \frac{\cancel{\text{s}^2}}{\cancel{\text{m}^2}} = \frac{\text{kg} \cdot \text{m}}{\text{s}^2}$$

$$m = 1110 \text{ kg}$$

