

38. $m = 75 \text{ lb}$

Centripetal force = Tension.

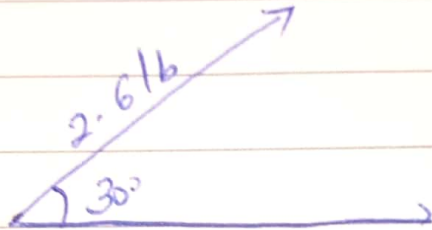
$$v = 12 \text{ ft/s}$$

$$r = 10 \text{ ft}$$

$$\text{Tension} = \frac{1}{2} \frac{mv^2}{r}$$

$$= \frac{75}{32.2} \times \frac{12^2}{10} = 33.54 \text{ lb}$$

39.



$$F = 2.6 \text{ lb}$$

$$d = 2640 \text{ ft}$$

$$\theta = 30^\circ$$

$$\begin{aligned} \text{Work done} &= F d \cos \theta \\ &= 2.6 (2640) \cos 30^\circ \\ &= 5944.398 \text{ J} \end{aligned}$$

40. Period = 0.5 sec
Mass = 3.0 kg

$$\omega^2 = \frac{k}{m}$$

$$\omega = \frac{2\pi}{T}$$

$$\left(\frac{2\pi}{T}\right)^2 = \frac{k}{m}$$

$$k = m \left(\frac{2\pi}{T}\right)^2 = 3 \left(\frac{2\pi}{0.5}\right)^2 = 473.74 \frac{\text{kg}}{\text{s}^2}$$

$$41. \quad m_1 = 75 \text{ lb} \quad m_2 = 65 \text{ lb}$$

$$d_1 = ?$$

$$d_2 = 7 \text{ ft}$$

$$m_1 d_1 = m_2 d_2$$

$$d_1 = \frac{m_2 d_2}{m_1} = \frac{65 \times 7}{75}$$

$$= 6.07 \text{ ft}$$

$$42. \quad T = 2\pi \sqrt{\frac{L}{g}}$$

$$T = 2$$

$$\sqrt{\frac{L}{g}} = \frac{T}{2\pi} \quad \frac{L}{g} = \left(\frac{T}{2\pi}\right)^2 \quad L = g \left(\frac{T}{2\pi}\right)^2$$

$$L = 9.81 \left(\frac{2}{2\pi} \right)^2$$

$$= 0.994 \text{ m}$$