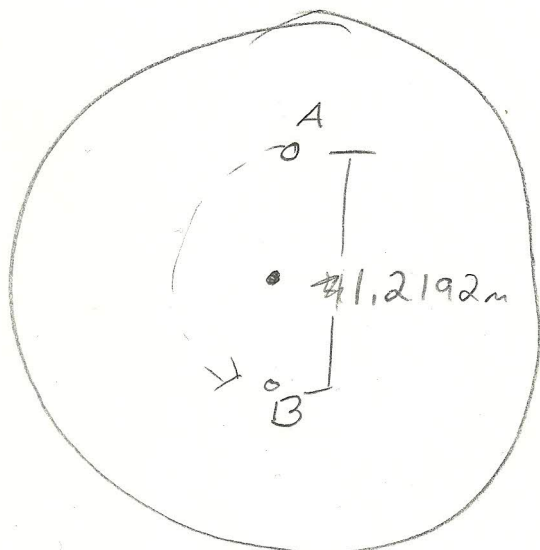


3)



$$2 \text{ ft} = 0.6096 \text{ m}$$

$$4 \text{ ft} = 1.2192 \text{ m}$$

$$40 \text{ lb} = 18.144 \text{ kg}$$

$$20 \text{ lb} = 9.072 \text{ kg}$$

$$120 \text{ rpm} = 4\pi \text{ rad/s}$$

$$\begin{aligned} W_{A \rightarrow B} &= mg(1.2192 \text{ m}) \\ &= (9.072)(9.81)(1.2192) = 108.5 \text{ J} \end{aligned}$$

$$W = KE_2 - KE_1$$

$$KE_2 = W + KE_1$$

$$\frac{1}{2} I \omega_f^2 = W_{A \rightarrow B} + \frac{1}{2} I \omega_i^2$$

$$(12.192) \omega_f^2 = 108.5 + (12.192)(4\pi)^2$$

$$12.192 \omega_f^2 = 2033.7835$$

$$\omega_f^2 = 166.813$$

$$\omega_f = 12.916 \frac{\text{rad/s}}{\text{s}} = 4.111 \pi \frac{\text{rad/s}}{\text{s}}$$

$$= 123,335 \text{ rpm}$$

$$\text{where } KE = \frac{1}{2} I \omega^2$$

$$\text{and } I = \frac{1}{2} m r^2$$

$$= 20(1.2192)$$

$$= 24.384 \text{ kg} \cdot \text{m}^2$$