$$d = 0.24 \text{ m}$$

$$m_A = m = 11 \text{ kg}$$

$$m_B = 2 m_A$$

$$\omega_0 = 0 \qquad \omega_1 = 8 \text{ rad/s}$$

$$W_{0 \to 1} = ?$$

$$W = \int M \, d\theta \qquad\qquad W_{TOT} = \Delta E_k = E_{k,fin} - \cancel{0}$$

$$W_{0 \to 1} = \frac{1}{2} I_z \, \omega_1^2 \qquad\qquad I_z = I_A + I_B$$
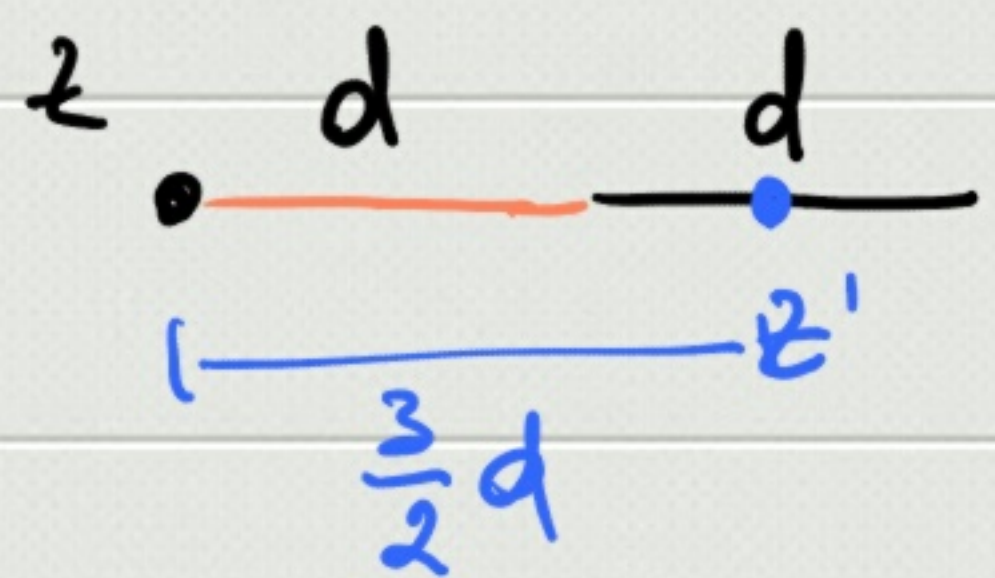⇑

$$I_A = \frac{1}{3} m_A d^2$$

$$I_B = \frac{1}{3} m_B \cancel{d^2} + m_B d^2$$

$$I_B = \frac{1}{12} m_B \cancel{d^2} + m_B d^2$$

$$I_B = \frac{1}{12} m_B d^2 + m_B \left(\frac{3}{2} d\right)^2 \quad *$$

$$I_B = \cancel{m_B \left(\frac{3}{2} d\right)^2}$$

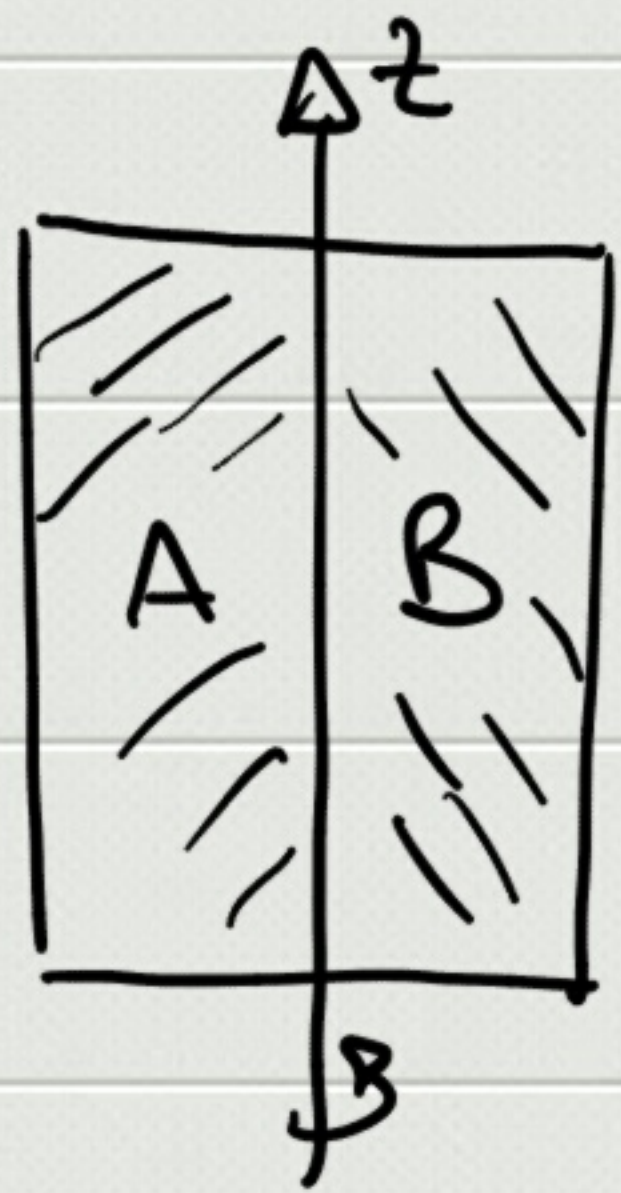$$\frac{3}{2} d$$

$$I_z = I_{z'} + m a^2$$

$$I_A = \frac{1}{3} m d^2$$

$$I_B = \frac{1}{\cancel{12}_6} 2m d^2 + 2m \frac{9}{4_2} d^2$$

$$I_z = I_A + I_B = m d^2 \left(\frac{1}{3} + \frac{1}{6} + \frac{9}{2} \right) = 5\, m\, d^2$$

$$W_{0 \to 1} = \frac{1}{2} I_z \omega_1^2 = \frac{1}{2} 5 m d^2 \omega_1^2 = 101.4 \ J$$

$$W_{1 \to 2} = ?$$

$$W_{1 \to 2} = \Delta E_k = \frac{1}{2} I_z' \omega_2^2 - \frac{1}{2} \bar{I}_z \omega_1^2$$

$$I_z' = \frac{1}{12} \left(\cancel{m_A + m_B} \right) d^2$$

$$I_z' = \frac{1}{12} \left(\cancel{m_A + m_B} \right) (2d)^2 \qquad \underline{\quad d \quad \overset{z}{\bullet} \quad d \quad}$$

$$I_z' = \frac{1}{3} m_A d^2 + \frac{1}{3} m_B d^2 \qquad * \qquad = m d^2$$

$$I_z' = \left[\frac{1}{12} m_A d^2 + m_A \left(\frac{d}{2} \right)^2 \right] + \left[\frac{1}{12} m_B d^2 + m_B \left(\frac{d}{2} \right)^2 \right]$$
$$*$$

$$\bar{M}_o^e = 0 \implies \boxed{\bar{L} = \text{cost}}$$

$$\implies \bar{L}_1 = \bar{L}_2 \implies I_z \, \omega_1 = I_z' \, \omega_2$$

$$\implies \omega_2 = \frac{I_z}{I_z'} \, \omega_1 = \frac{5m\,d^2}{m\,d^2} \, \omega_1 = 5\,\omega_1$$

$$\implies W_{1\to 2} = \frac{1}{2} I_z' \, \omega_2^2 - \frac{1}{2} I_z \, \omega_1^2 = 10\,m\,d^2\,\omega_1^2 =$$

$$= 405.5 \ J$$