

Act 2 Solution

- Since the string is pulled through a hole at the center of rotation, there is no torque: Angular momentum is conserved.

$$L_1 = I_1 \omega_1 = mR^2 \omega_1 = L_2 = I_2 \omega_2 = m \left(\frac{R}{2} \right)^2 \omega_2$$

$$mR^2 \omega_1 = m \frac{1}{4} R^2 \omega_2$$

$$\omega_1 = \frac{1}{4} \omega_2$$



$$\omega_2 = 4\omega_1$$

