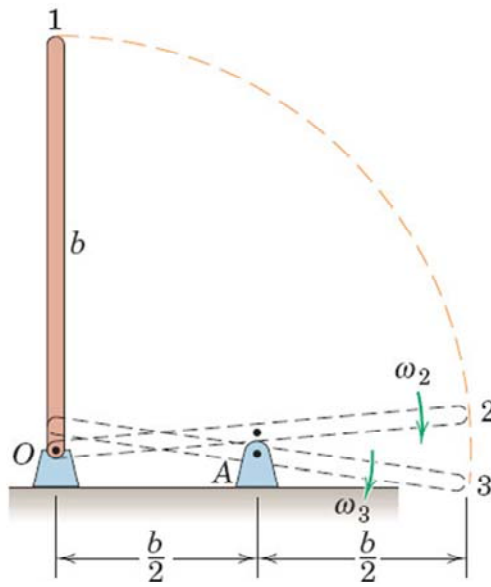


Question of the Day



A slender bar of **mass m** and **length b** is released from rest and pivots at **O** until the bar strikes **A** and then pivots at **A** . The **angular velocity $\omega_2 = (3g/b)^{1/2}$** just before it engages the pivot at **A** .

Determine the **angular velocity ω_3** of the bar just after it engages the pivot at **A** .

ME 231: Dynamics

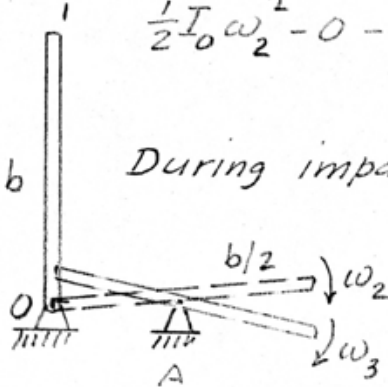
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From 1 to 2, $\Delta T + \Delta V_g = 0$

$$\frac{1}{2} I_O \omega_2^2 - 0 - mg \frac{b}{2} = 0, \quad \frac{1}{3} m b^2 \omega_2^2 = m g b$$

$$\omega_2 = \sqrt{3g/b}$$

During impact with A , $\Delta H_A = 0$, $H_{A_2} = H_{A_3}$



$$H_{A_2} = \bar{I} \omega_2$$

$$H_{A_3} = \bar{I} \omega_3$$

$$\text{so } \omega_3 = \omega_2$$

$$= \sqrt{3g/b}$$