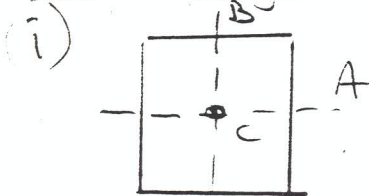


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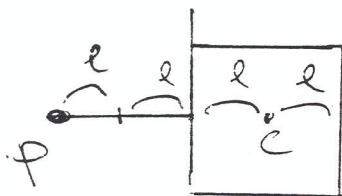


$$I_A = \frac{1}{3} m l^2 = I_B$$

$$I_c = I_A + I_B = \frac{1}{3} m l^2 + \frac{1}{3} m l^2 = \frac{2}{3} m l^2$$

(Parallel axis theorem)

(ii)



for Rod

$$I_p = \frac{4}{3} m l^2$$

For lamina.

Parallel axis theorem

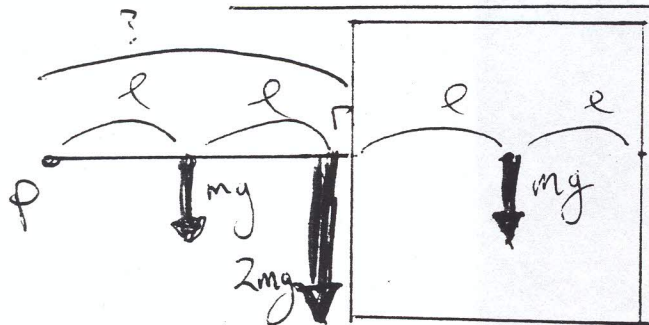
$$I_p = I_c + m (pc)^2$$

$$= \frac{2}{3} m l^2 + m (3l)^2$$

$$= \frac{29}{3} m l^2$$

The system. $I_p = \frac{4}{3} m l^2 + \frac{29}{3} m l^2 = 11 m l^2$.

(iii)



$$T = 2\pi \sqrt{\frac{I}{\text{mass } g (\text{distance between pivot and } G_{cm})}}$$

$$= 2\pi \sqrt{\frac{11 m l^2}{(2m) g (2l)}}$$

$$= 2\pi \sqrt{\frac{11 l}{4g}}$$

Find $|pr|$: Take moments about P:

$$-2mg|pr| = -mg(l) - mg(3l)$$

$$\Rightarrow |pr| = 2l.$$