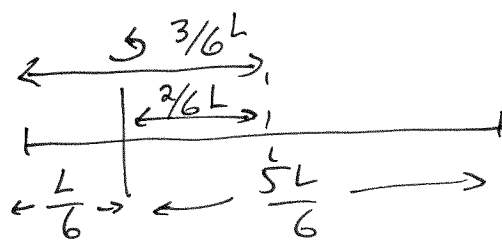


Chapter 10Problem 65

What is the moment of inertia for the rod?



By the parallel axis theorem
$$I = I_{cm} + mh^2$$

For a rod about its center of mass

$$I_{cm} = \frac{1}{12} mL^2$$

The new pivot point is $\frac{2}{6}L$ away from the center of mass.

$$\text{so } h = \frac{1}{3}L$$

Then
$$I = I_{cm} + mh^2$$

$$= \frac{1}{12} mL^2 + m \left(\frac{L}{3} \right)^2$$

$$= \frac{1}{12} mL^2 + \frac{mL^2}{9}$$

using a common denominator

$$I = \frac{3}{36} mL^2 + \frac{4}{36} mL^2 = \boxed{\frac{7}{36} mL^2}$$