

B/27

Part 1:

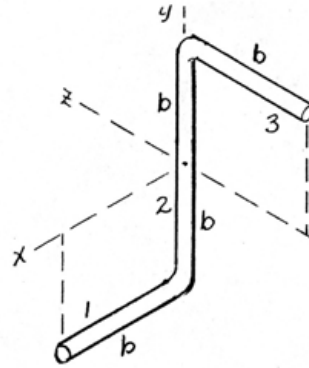
$$m_1 = m/4$$

$$I_{xx} = \frac{m}{4} b^2$$

$$I_{yy} = \frac{1}{3} \frac{m}{4} b^2 = \frac{1}{12} m b^2$$

$$I_{zz} = \frac{1}{12} \frac{m}{4} b^2 + \frac{m}{4} \left[\left(\frac{b}{2} \right)^2 + b^2 \right]$$

$$= \frac{1}{3} m b^2$$



Part 2:

$$m_2 = \frac{1}{2} m$$

$$I_{xx} = \frac{1}{12} \frac{m}{2} (2b)^2 = \frac{1}{6} m b^2$$

$$I_{yy} = 0$$

$$I_{zz} = \frac{1}{6} m b^2$$

Part 3:

$$m_3 = m/4$$

$$I_{xx} = \frac{1}{12} \frac{m}{4} b^2 + \frac{m}{4} \left[\left(\frac{b}{2} \right)^2 + b^2 \right] = \frac{1}{3} m b^2$$

$$I_{yy} = \frac{1}{3} \frac{m}{4} b^2 = \frac{1}{12} m b^2$$

$$I_{zz} = \frac{m}{4} b^2$$

Total:

$$I_{xx} = m b^2 \left(\frac{1}{4} + \frac{1}{6} + \frac{1}{3} \right) = \frac{3}{4} m b^2$$

$$I_{yy} = m b^2 \left(\frac{1}{12} + 0 + \frac{1}{12} \right) = \frac{1}{6} m b^2$$

$$I_{zz} = m b^2 \left(\frac{1}{3} + \frac{1}{6} + \frac{1}{4} \right) = \frac{3}{4} m b^2$$