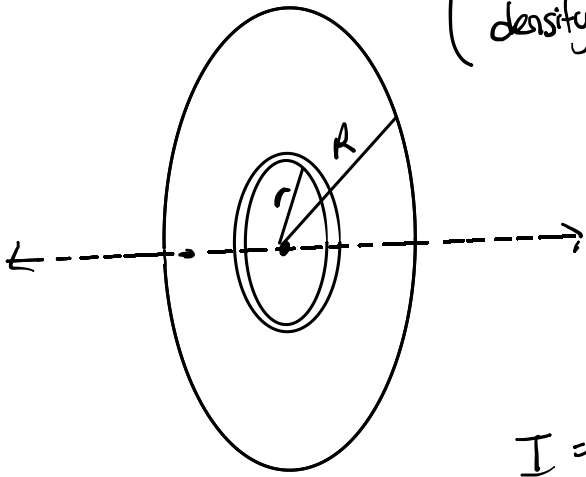


$$\left(\begin{array}{l} \text{mass} \\ \text{density} = \sigma \end{array} \right) \left(\sigma = \frac{M}{\pi R^2} \right)$$

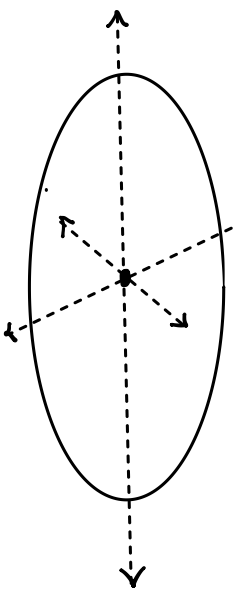


$$\left. \begin{array}{l} dm = \sigma dA \\ dA = 2\pi r dr \end{array} \right\} dm = 2\pi \sigma r dr$$

$$I = \int r^2 dm = \int_0^R r^2 2\pi \sigma r dr = 2\pi \sigma \int_0^R r^3 dr$$

$$\frac{\pi \sigma R^4}{2} = \frac{1}{2} \pi R^4 \frac{M}{\pi R^2} = \frac{1}{2} MR^2$$

$$\left(\begin{array}{l} \text{mass} \\ \text{density} = \sigma \end{array} \right) \left(\sigma = \frac{M}{\pi R^2} \right)$$



from perpendicular axis theorem

$$I_{\text{central axis}} = 2 I_{\text{diameter}} = \frac{1}{2} MR^2 \Rightarrow I_{\text{diameter}} = \frac{1}{4} MR^2$$

