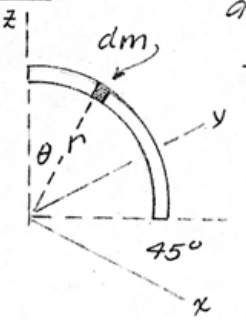
B/56 Let ρ = mass per unit length of rod



$dm = \rho r\,d\theta$

$$I_{xy} = \int_0^{\pi/2} (r\sin\theta\cos 45^\circ)^2 \rho r\,d\theta$$

$$= \rho r^3 \frac{1}{2}\int_0^{\pi/2} \sin^2\theta\,d\theta = \frac{1}{8}\pi\rho r^3$$

$$= \frac{1}{4}mr^2$$

$$I_{xz} = I_{yz} = \int yz\,dm = \int_0^{\pi/2} (r\sin\theta\sin 45^\circ)(r\cos\theta)\rho r\,d\theta$$

$$= \rho r^3 \frac{1}{\sqrt{2}}\int_0^{\pi/2} \sin\theta\cos\theta\,d\theta = \frac{\rho r^3}{\sqrt{2}}\left[\frac{-\cos 2\theta}{4}\right]_0^{\pi/2}$$

$$= \frac{1}{2\sqrt{2}}\rho r^3 = \frac{1}{\pi\sqrt{2}}mr^2$$