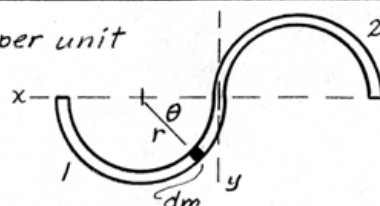


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$I_{xy_1} = I_{xy_2}$; Let $\rho =$ mass per unit length

$$m_1 = \pi r \rho, m = 2\pi r \rho$$



$$I_{xy_1} = \int xy dm = \int_0^\pi r(1-\cos\theta)(r\sin\theta)\rho r d\theta$$

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

$$I_{xy} = 2I_{xy_1} = 4\rho r^3 = \underline{2mr^2/\pi}, \quad \underline{I_{xz} = I_{yz} = 0}$$