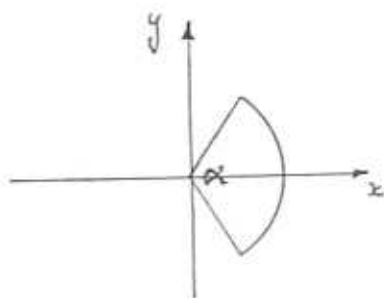


.16

$$dm = \rho dx = A \rho dx$$

$$x_{cm} = \frac{\int x dm}{\int dm} = \frac{\rho \int_0^L x^2 dx}{\rho \int_0^L x dx} = \frac{\frac{\rho x^3}{3} \Big|_0^L}{\frac{\rho x^2}{2} \Big|_0^L} = \frac{2}{3} L$$



.2

$$dm = \sigma ds = \sigma \cdot r dr d\theta = B r \cdot r dr d\theta$$

$$\begin{aligned} y_{cm} &= \frac{\int y dm}{\int dm} = \frac{\int r \sin \theta dm}{\int dm} = \frac{\iint r \sin \theta \cdot B r^2 dr d\theta}{\iint B r^2 dr d\theta} = \\ &= \frac{B \int_0^L r^3 dr \int_{-\pi/2}^{+\pi/2} \sin \theta d\theta}{B \int_0^L r^2 dr \int_{-\pi/2}^{+\pi/2} d\theta} = (12\pi L) \times \underbrace{\int_{-\pi/2}^{+\pi/2} \sin \theta d\theta}_{=0} \end{aligned}$$

Handwritten notes at the bottom of the page, including the number 10 and some illegible text.

במקרה זה  $y_{cm} = 0$  108

$$x_{cm} = \frac{\int x dm}{\int dm}$$

$$\int x dm = \int r \cos \theta dm = B \int_0^L dr \cdot r^3 \int_{-\alpha/2}^{+\alpha/2} \cos \theta d\theta =$$

$$= B \frac{L^4}{4} \left( \sin \theta \right)_{-\alpha/2}^{+\alpha/2} = B \frac{L^4}{2} \sin \frac{\alpha}{2}$$

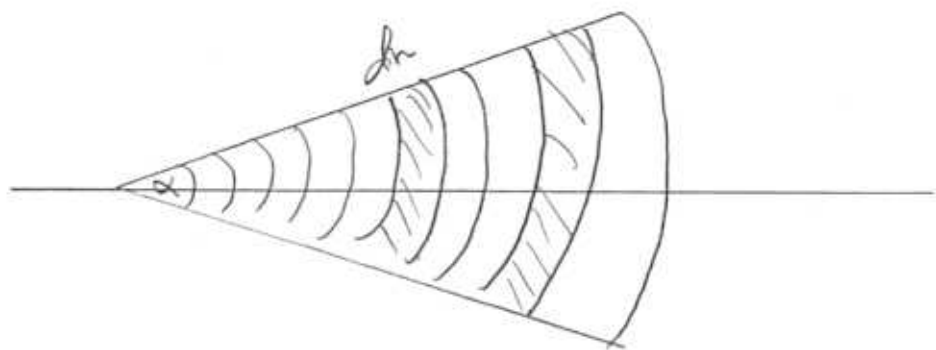
$$\int dm = B \int_0^L r^2 dr \int_{-\alpha/2}^{+\alpha/2} d\theta = B \frac{L^3}{3} \alpha$$

$$x_{cm} = \frac{B \frac{L^4}{4} \sin \frac{\alpha}{2}}{B \frac{L^3}{3} \cdot \frac{\alpha}{2}} = \frac{3}{4} L \frac{\sin \frac{\alpha}{2}}{\alpha/2} = \frac{3}{4} L \operatorname{sinc} \left( \frac{\alpha}{2} \right)$$

$$\lim_{\alpha \rightarrow 0} \frac{3}{4} L \operatorname{sinc} \left( \frac{\alpha}{2} \right) = \frac{3}{4} L$$

המרחק  $x_{cm}$  הוא  $\propto x^2$

$$\propto x^2$$



אלקטרון  
 קרינה  
 המרחק  
 $dm$   
 המרחק  
 $r$   
 המרחק  
 $r^2$   
 $ds = r^2 d\alpha$   
 $\sigma = B r^2$   
 המרחק  
 $r$