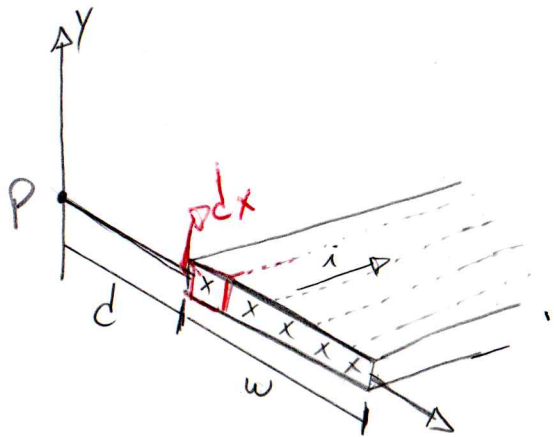


Cap 29 Ex 31



largura  $w = 4,91 \text{ cm}$   
 $i = 4,61 \text{ mA}$   
 $d = 2,16 \text{ cm}$

$\vec{B}$  ?

Considerando a corrente que passa por  $dx$  temos:

$$di = i \cdot \frac{dx}{w}$$

O campo mag. gerado pela corrente num fio:

$$|\vec{B}| = \frac{\mu_0 i}{2\pi r}, \text{ onde}$$

$r$  é a distância de  $dx$  à  $P$ .

logo

$$d|\vec{B}| = \frac{\mu_0 di}{2\pi x}$$

$$d|\vec{B}| = \frac{\mu_0 \cdot i dx}{2\pi x w}$$

$$|\vec{B}| = \int d|\vec{B}| = \int_d^{d+w} d|\vec{B}|$$

$$|\vec{B}| = \frac{\mu_0 i}{2\pi w} \int_d^{d+w} \frac{dx}{x}$$

$$|\vec{B}| = \frac{\mu_0 i}{2\pi w} \ln x \Big|_d^{d+w}$$

$$\ln\left(1 + \frac{w}{d}\right)$$

$$|\vec{B}| = \frac{4\pi \times 10^{-7} \cdot 4,61 \times 10^{-6}}{2\pi \cdot 0,0491} \cdot \ln\left(1 + \frac{0,0491}{0,0216}\right)$$

$$|\vec{B}| = 1,877 \cdot 10^{-11} \cdot 1,185$$

$$|\vec{B}| = 2,2 \times 10^{-11} \text{ T}$$

no ponto  $P$   $\vec{B}$  é  $\perp$  a  $i$ , logo

$$\vec{B} = (2,2 \times 10^{-11} \text{ T}) \hat{j}$$