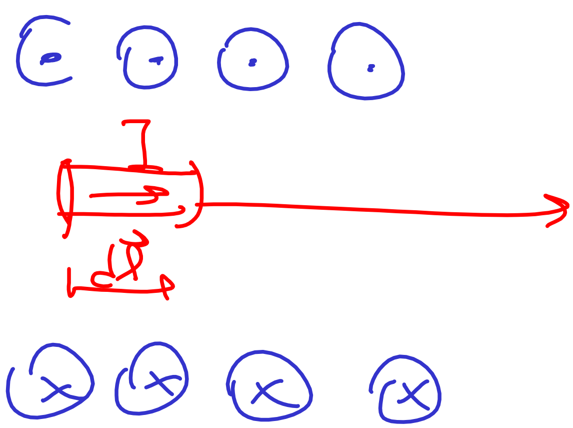
TALLER 10

Biot - Savart:

$$\vec{B} = \frac{\mu_0}{4\pi} \frac{q\vec{v}\times\hat{r}}{r^2}$$ por 1 carga.

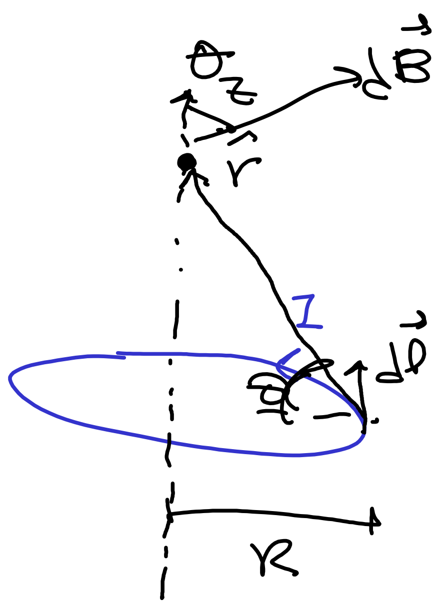
$$d\vec{B} = \frac{\mu_0}{4\pi} \frac{I\,d\vec{\ell}\times\hat{r}}{r^2}$$



Sale $\odot$

Entra $\otimes$

Ej:



$$B_z = \frac{\mu_0}{4\pi} \frac{I}{r^2} \underbrace{\int d\ell}_{2\pi R} \cos\theta$$

$$\frac{\cos\theta}{r^2} = \frac{R^2}{(R^2+z^2)^{3/2}}$$

$$\vec{B}_z = \frac{\mu_0 I}{2} \frac{R^2}{(R^2+z^2)^{3/2}}\,\hat{z}$$

$$B_z(z=0) = \frac{\mu_0 I}{2R}$$

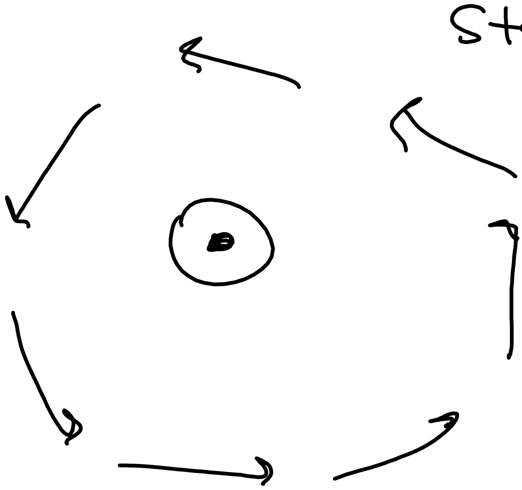
Ley de Ampère

$$\nabla \cdot \vec{B} = 0$$

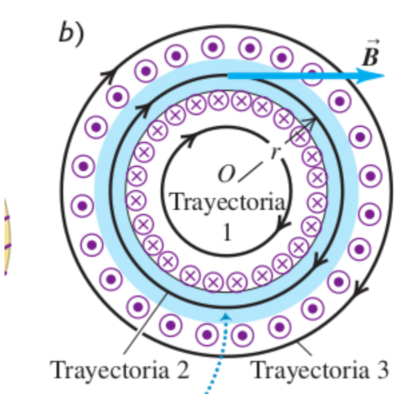
$$\boxed{\oint \vec{B} \cdot d\vec{l} = \mu_0 I_{enc.}}$$

$$\nabla \times \vec{B} \propto I_{enc}$$

Teorema de Stokes.



→ 'Amperia Loop'



Trayectoria 1:

$$B(2\pi r) = \mu_0 (0)$$

$$\Rightarrow B = 0.$$

Trayectoria 3:

$$\vec{B}(2\pi r) = \mu_0 \underset{0}{(\cancel{I - I})}$$

Trayectoria 2:

$$B(2\pi r) = \mu_0 I_{enc}$$

$\hookrightarrow I_{enc} = NI$

$$\boxed{\vec{B} = \frac{\mu_0 N I}{2\pi r}}\ \hat{\phi}$$