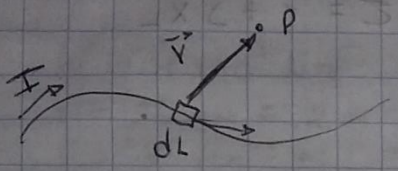
Ley de Biot-Savart

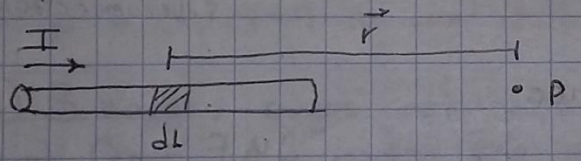
$$\vec{B} = \frac{\mu_0}{4\pi} \int \frac{I\, \vec{dL} \times \vec{r}}{r^2}$$



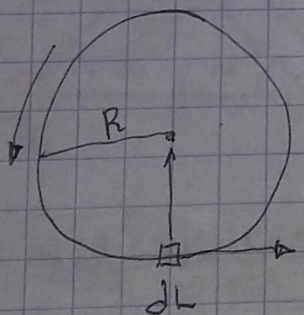
$$\vec{B} = \frac{\mu_0}{4\pi} \int \frac{I\, dL\, |\vec{r}|\, Sen\,\emptyset}{r^2}$$

$$\vec{B} = \frac{\mu_0}{4\pi} \int \frac{I\, dL\, Sen\,\theta}{r^2}$$

$\emptyset$ entre $\vec{dL}$ y $\vec{r}$



$$\vec{B} = \frac{\mu_0}{4\pi} \int \frac{I\, dL\, Sen\,\theta}{r^2} = \vec{B} = 0$$



$$\vec{B} = \frac{\mu_0}{4\pi} \int \frac{I\, dL\, Sen\,90^\circ}{R^2}$$

$$\vec{B} = \frac{\mu_0}{4\pi} \cdot \frac{I}{R^2} \int dL$$

$$\vec{B} = \frac{\mu_0 I}{4\pi R^2} L \qquad L = 2\pi R$$

Traer

MCM de los conductores { cc, L.M, L.L

RMG

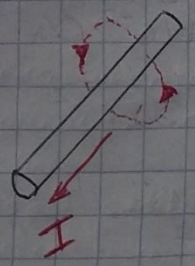
radio medio geometrico

Circuito P, L.T (Mediana Ø larga)

X : R

reactancia es proporcional al conductor (resistencia)

Ley de Ampere



$$\oint \vec{B} \cdot d\vec{L} = \mu_0 I$$

I = Corriente
$\oint$ = Integral de trayectoria cerrada
dL = Diferencial de longitud
$\vec{B}$ = Campo Magnetico

Datos

$$\oint \vec{B} \cdot dL = \mu_0 I$$

$$B \oint dL = \mu_0 I$$

$I = 80\ A$
$r = 3 \times 10^{-3}$
$\mu_0 = 4\pi \times 10^{-7}$
$L = 2\pi r$

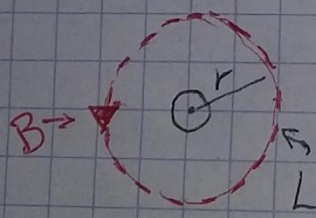
$$BL = \mu_0 I$$

$$B = \frac{\mu_0 I}{L}$$

$$B = \frac{4\pi \times 10^{-7}(80)}{2\pi(3\times10^{-3})}$$

$$B = 5.33 \times 10^{-3}\ T$$

$$B = 5.33\ mT$$



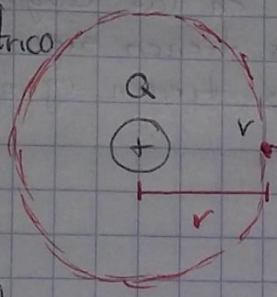
Ley de gauss

$E = ?$

$$\oint \vec{E} \cdot d\vec{A} = \frac{Q}{\varepsilon_0}$$

$$\frac{1}{\varepsilon_0} = 4\pi K$$

E = Campo Electrico
$\oint$ = Integral de una trayectoria cerrada
dA = Diferencia de Area
Q = Carga cerrada
ε_0 = Epsilon sub cero



$$\oint \vec{E} \cdot d\vec{A} = \frac{Q}{\varepsilon_0}$$

$$\oint E \cdot dA = \frac{Q}{\varepsilon_0}$$

$$E \oint dA = \frac{Q}{\varepsilon_0}$$

$$EA = \frac{Q}{\varepsilon_0} \qquad A = 4\pi r^2$$

$$E(4\pi r^2) = \frac{Q}{\varepsilon_0}$$

$$\frac{1}{\varepsilon_0} = 4\pi K$$

$$E = \frac{Q}{(4\pi r^2)\varepsilon_0}$$

$$K = \frac{1}{4\pi\varepsilon_0}$$

$$\boxed{E = \frac{KQ}{r^2}}$$