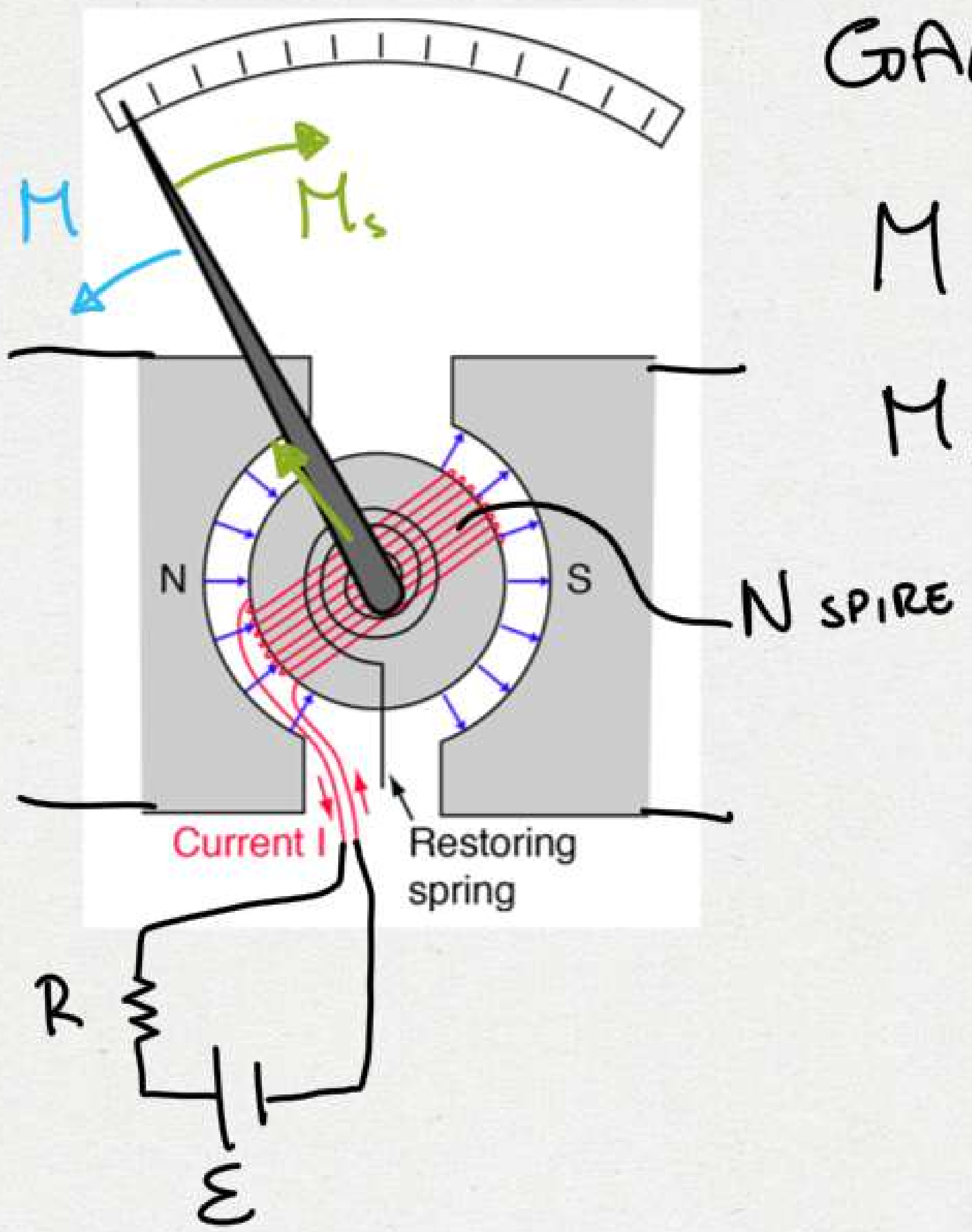


GALVANOMETRO

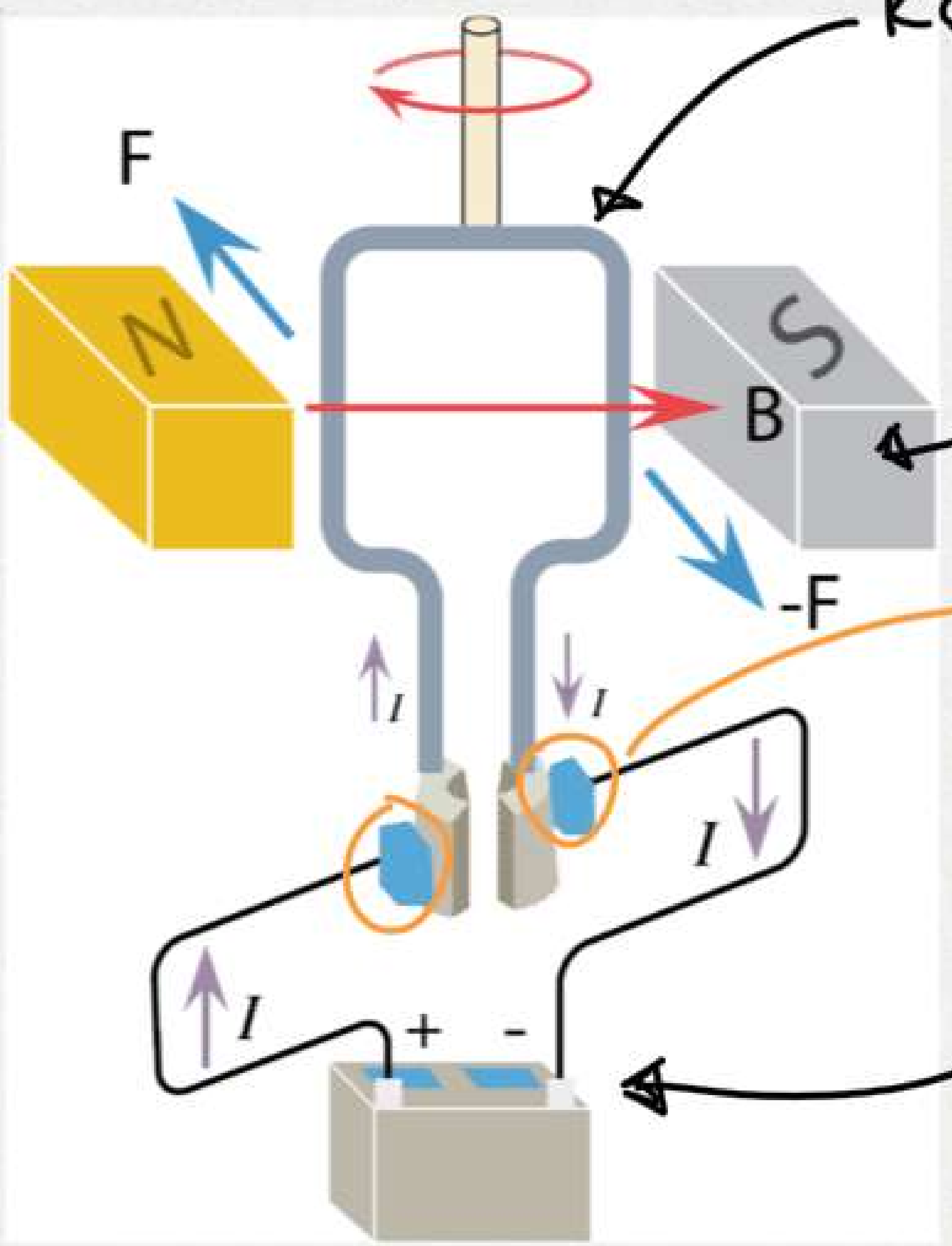
$$M = k\theta \qquad M_M = N M_s = i \Sigma N B$$

$$M_s = i \Sigma B$$

$$M = M_s \implies k\theta = i\Sigma B \implies i = \frac{k\theta}{\Sigma B}$$

ROTORE

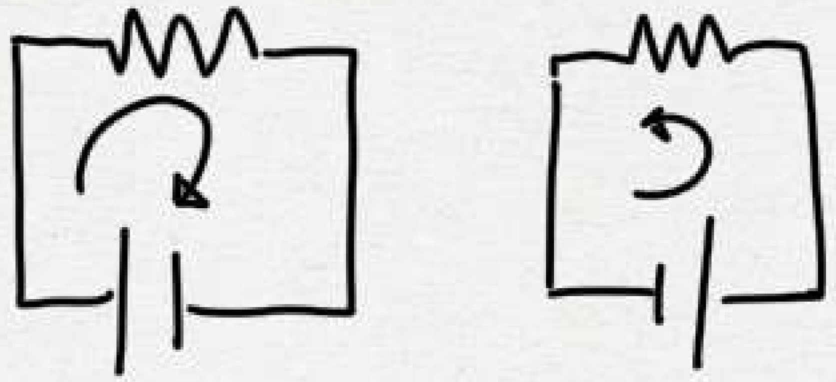
STATORE



- CONTATTI STRISCIANTI
- SPAZZOLE

COLLETTORE

$$\vec{m} = i \Sigma \hat{n}$$

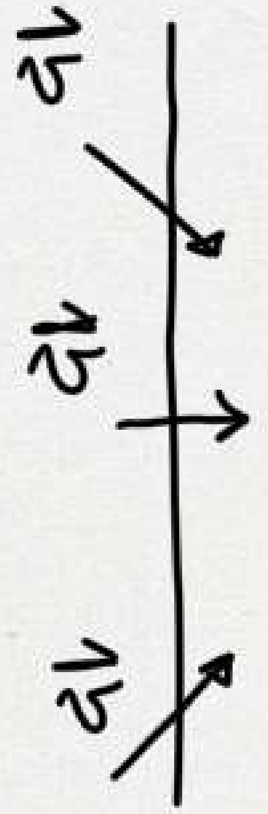


$\vec{B}$ UNIFORME

$$\vec{F}_L = q\vec{v} \times \vec{B} \quad , \quad F_L = qvB\sin\theta$$

$$\theta = \frac{\pi}{2}$$

$\vec{B} = 0$

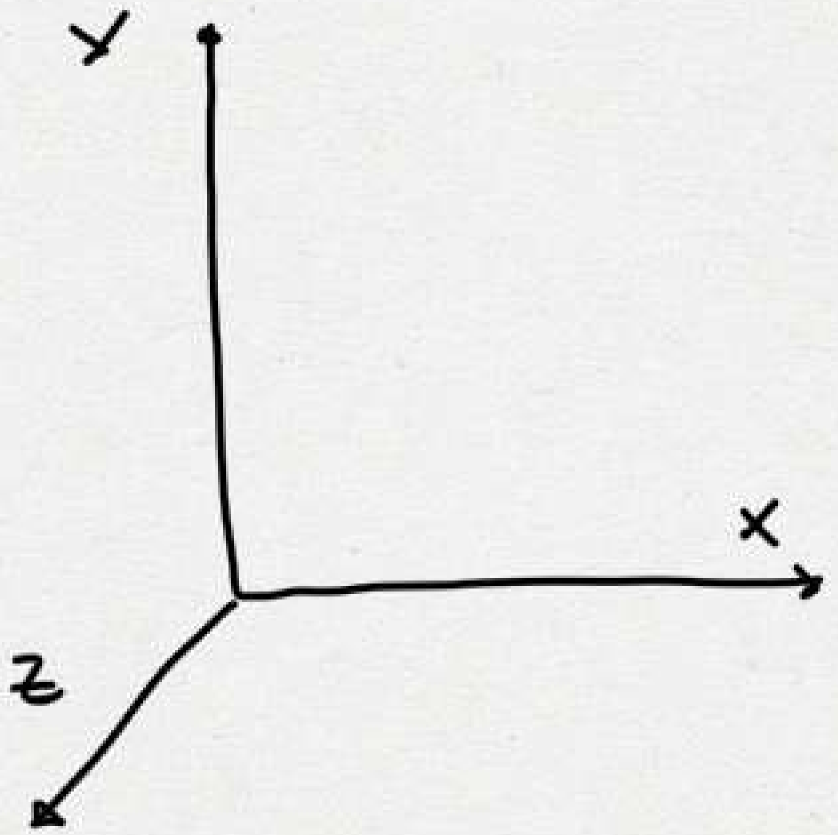


$\vec{B}\ \bullet$ USCENTE

$$\vec{a} \times \vec{b} = \vec{c}$$

$$\vec{c} \cdot \vec{a} = \vec{c} \cdot \vec{b} = 0$$

$$\vec{a} \times \vec{b} = - \vec{b} \times \vec{a}$$



$$\vec{v} = (v_x, v_y, v_z) = v_x \hat{x} + v_y \hat{y} + v_z \hat{z}$$

$$\vec{B} = B_x \hat{x} + B_y \hat{y} + B_z \hat{z}$$

$$\vec{v} \times \vec{B} = (v_x \hat{x} + v_y \hat{y} + v_z \hat{z}) \times (B_x \hat{x} + B_y \hat{y} + B_z \hat{z}) = v_x B_x \hat{x} \times \hat{x} + v_x B_y \hat{x} \times \hat{y} +$$

$$+ v_x B_z \hat{x} \times \hat{z} + v_y B_x \hat{y} \times \hat{x} + \ldots$$

$$\begin{cases} \hat{x} \times \hat{x} = \hat{y} \times \hat{y} = \hat{z} \times \hat{z} = 0 \\ -\hat{x} \times \hat{x} = 0 \end{cases}$$

$$\hat{x} \times \hat{y} = \hat{z}$$

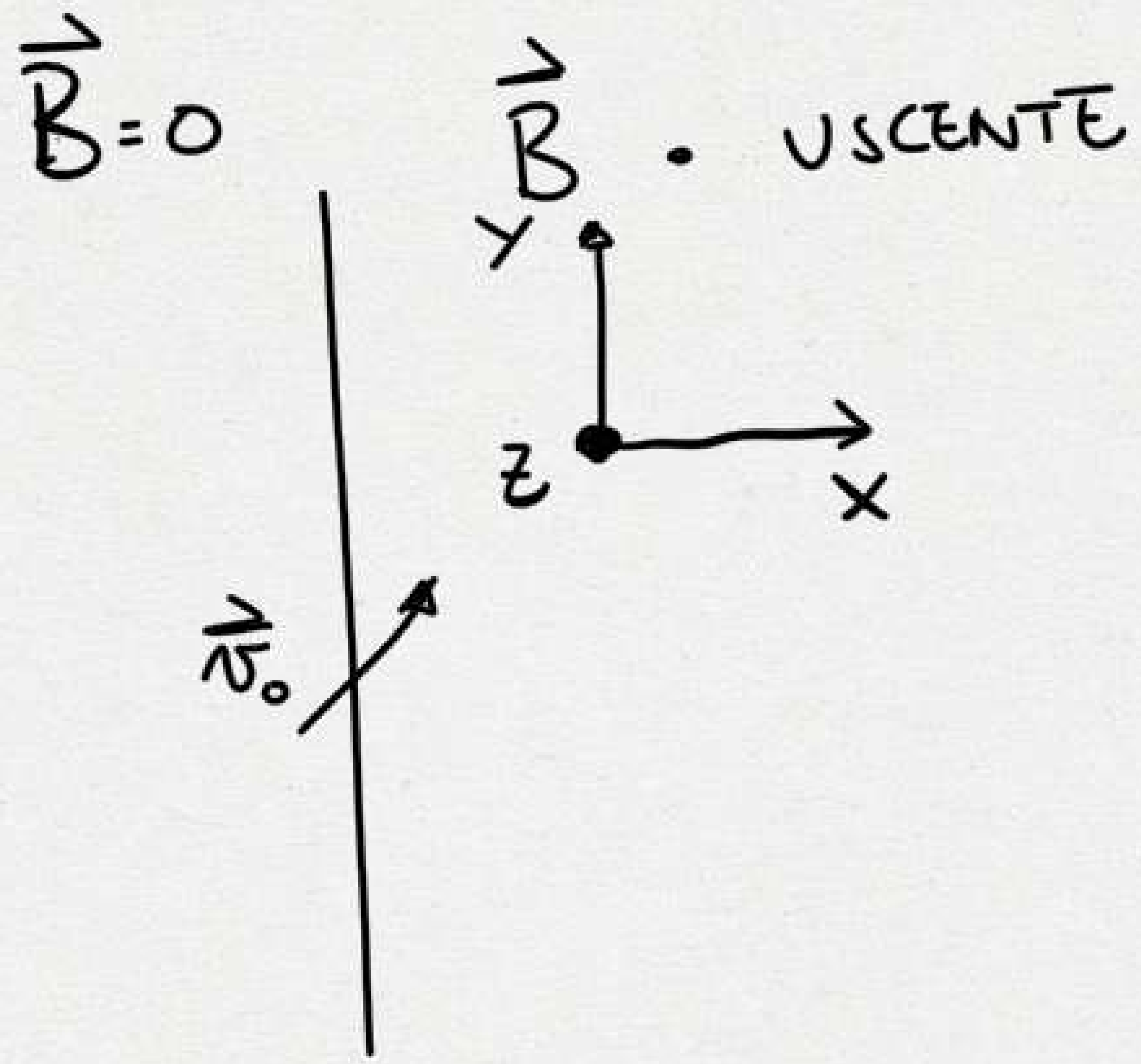
$$\hat{y} \times \hat{x} = -\hat{z}$$

$$\hat{x} \times \hat{z} = -\hat{y}$$

$+$ $x\,y\,z\,x\,y\,z\,x\,y\,z$

$-$ $y\,x\,z\,y\,x\,z$

$x\,z\,y\,x\,z\,y$



$$\vec v_0 = (v_{x0}, v_{y0}, 0) = v_{x0}\hat x + v_{y0}\hat y$$

$$\hat x \times \hat z = -\hat y$$
$$\hat y \times \hat z = \hat x$$

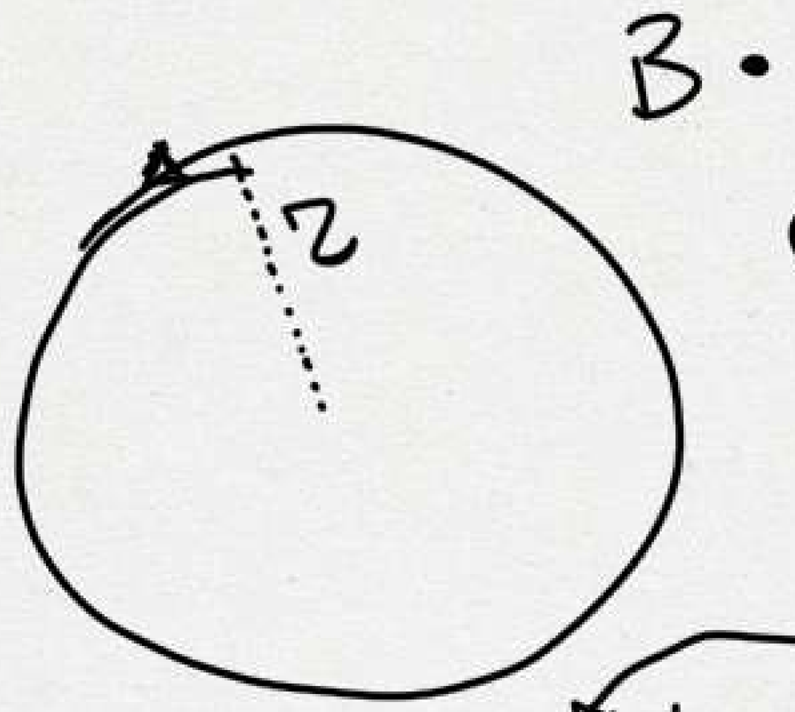
$$\vec B = (0,0,B) = B\hat z$$

$$\vec F_L = q\left(v_{x0}\hat x + v_{y0}\hat y\right)\times B\hat z = q v_{x0} B\, \hat x \times \hat z + q v_{y0} B\, \hat y \times \hat z =$$
$$= -q v_{x0} B\, \hat y + q v_{y0} B\, \hat x = (F_{x0}, F_{y0}, 0)$$

1 SE $\theta = \frac{\pi}{2}$ e $\vec v = (v_{0x}, v_{0y}, 0)$ ALLORA IL MOTO È CONFINATO AL PIANO X,Y

2 $\vec a = \frac{\vec F_L}{m} = \frac{q}{m}\vec v \times \vec B$, $\vec a \perp \vec v$ (I) , $a = \frac{q v B}{m}$ = COSTANTE (II)

IL MOTO È CIRCOLARE UNIFORME



① $v_t = \frac{2\pi r}{T} = v$

② $\omega = \frac{d\theta}{dt} = \frac{2\pi}{T} = \frac{v}{r}$

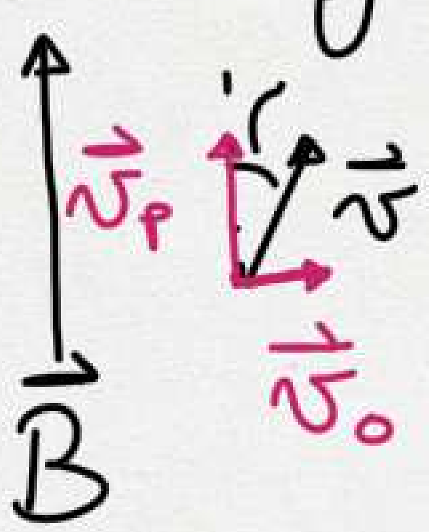
③ $\vec{a} = \vec{\omega} \times \vec{v} = \frac{q}{m}\vec{v} \times \vec{B} = -\frac{q}{m}\vec{B} \times \vec{v} \implies \vec{\omega} = -\frac{q}{m}\vec{B}$

$\omega = \frac{q}{m}B = \frac{v}{r} \implies$

$$\boxed{r = \frac{mv}{qB}}$$

$$\begin{cases} \vec{\omega} = -\frac{q}{m}\vec{B} & \text{CAMPO MAGNETICO} \\ \vec{a} = \frac{q}{m}\vec{E} & \text{CAMPO ELETTRICO} \end{cases}$$

$\theta \neq \frac{\pi}{2}$



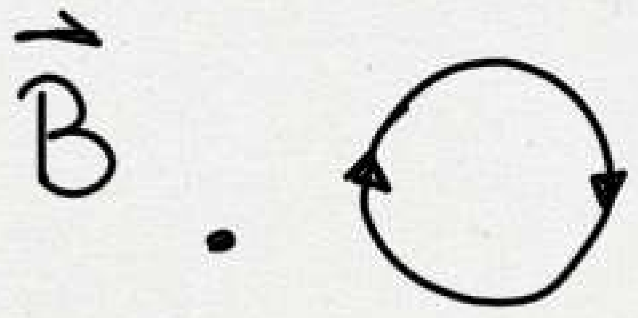
$$\vec{v} = \vec{v}_0 + \vec{v}_p$$

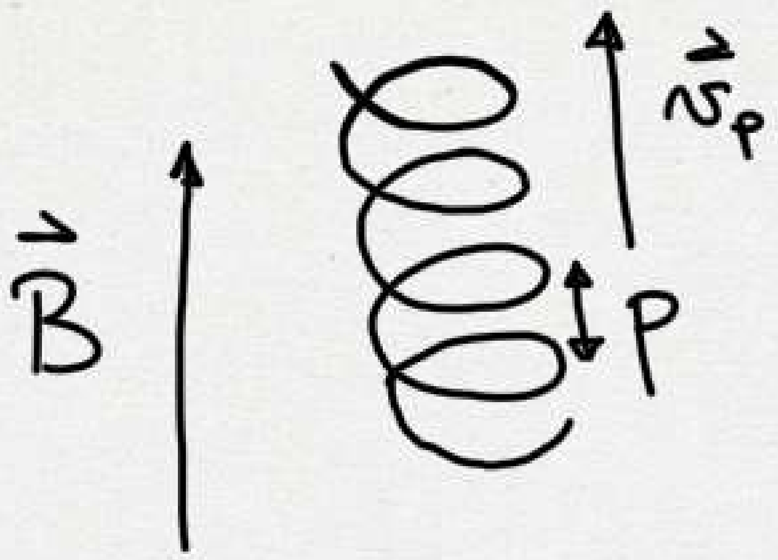
$$\vec{F}_L = q(\vec{v}_0 + \vec{v}_p) \times \vec{B} = q\vec{v}_0 \times \vec{B} + \overbrace{\cancel{q\vec{v}_p \times \vec{B}}}^{0} = q\vec{v}_0 \times \vec{B}$$

$$v_p = v\cos\theta$$

$$v_0 = v\sin\theta$$

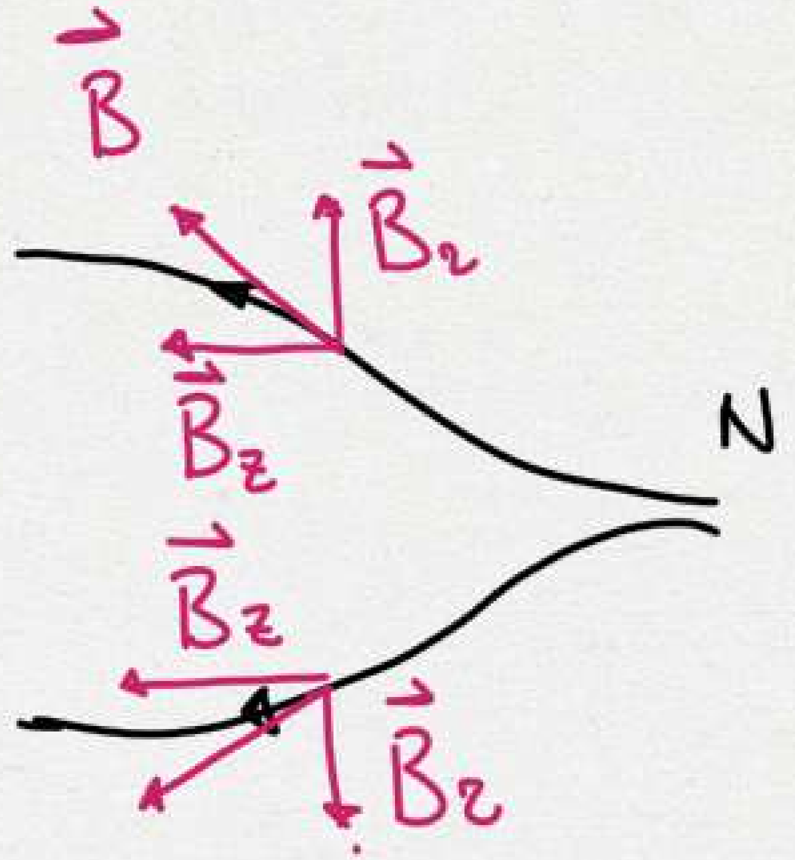
$$\boxed{r = \frac{m v_0}{qB} = \frac{m v \sin\theta}{qB}}$$





$$\omega = \frac{2\pi}{T} = \frac{v}{r} \Rightarrow T = \frac{2\pi r}{v}$$

$$p = v_p T = v_p \frac{2\pi r}{v_0} = \frac{v_p 2\pi r}{v_0}$$


$\vec{B}$
$\vec{B}_r$
$\vec{B}_z$
N
$\vec{B}_z$
$\vec{B}_r$