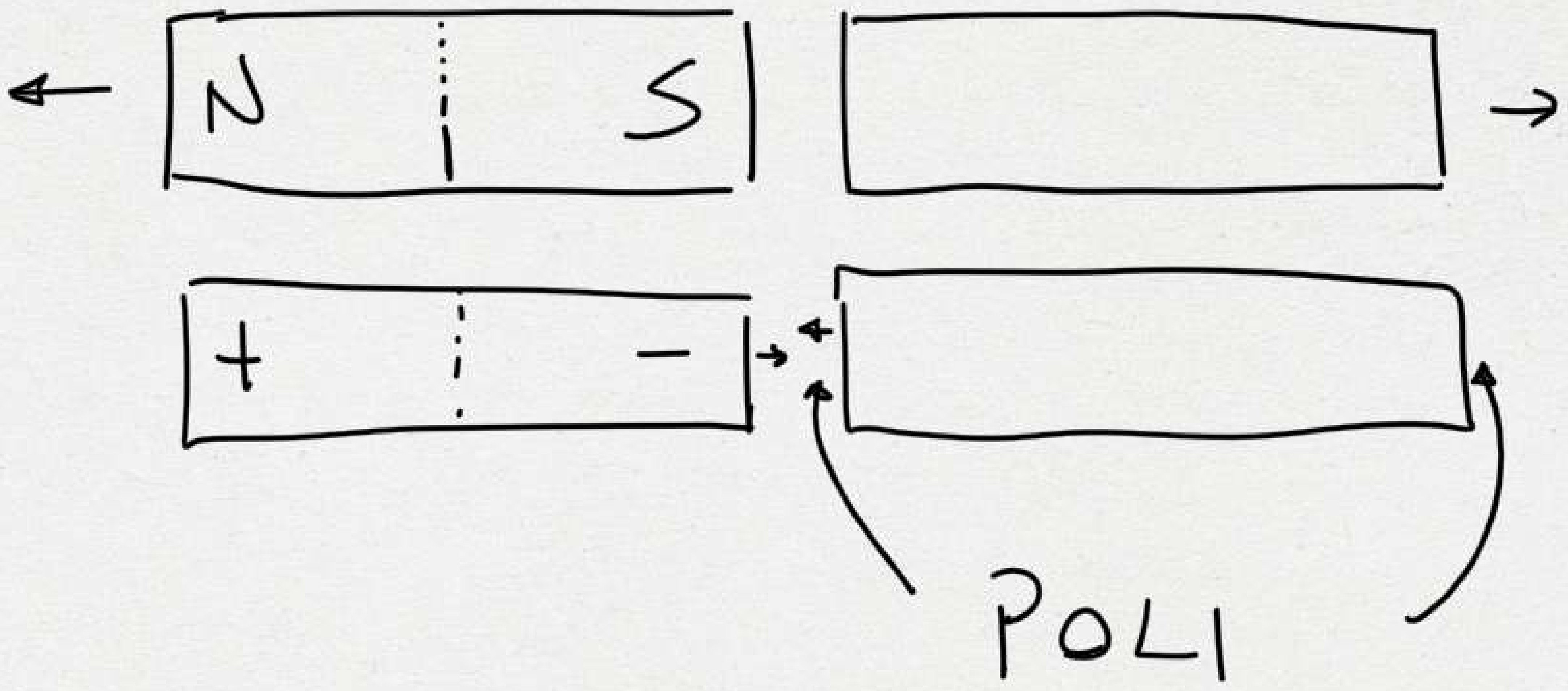
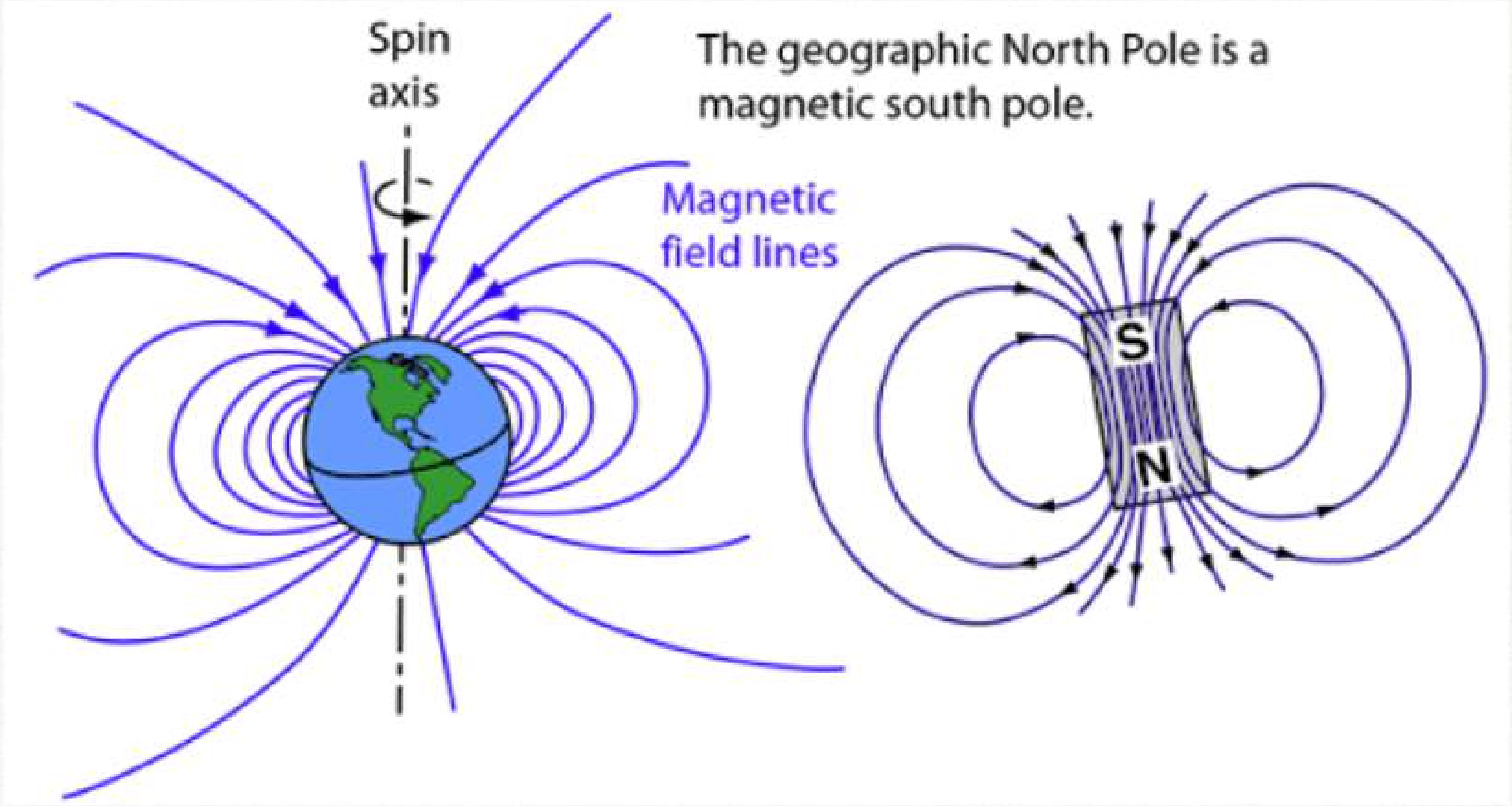


1. POLI + o −

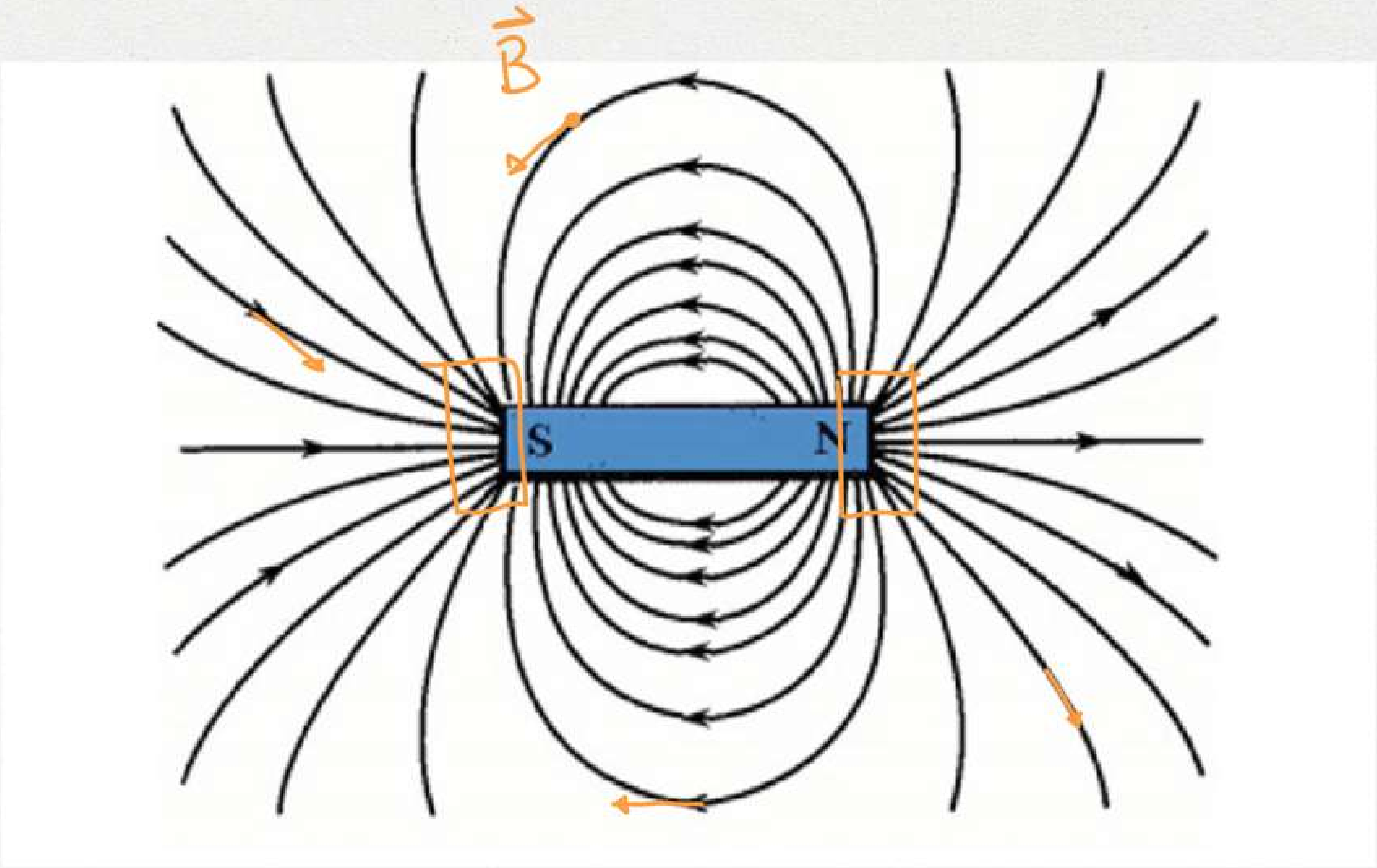
2. + + E − − SI RESPINGONO

   + − SI ATTRAGGONO

3. UN MAGNETE HA UN + E UN −



$$F_{NN} \sim \frac{1}{r^2}$$



$$\vec{F}_e = q\vec{E}$$

$$\vec{B}(t) \longrightarrow \vec{E}(t)$$
$$\vec{E}(t) \longrightarrow \vec{B}(t)$$

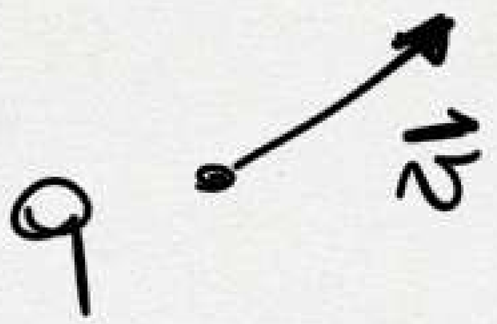
$\boxed{\vec{B} \quad \text{CAMPO MAGNETICO}}$

CAMPO DI INDUZIONE MAGNETICA

$$x' = x - vt$$ GALILEO

$$x' = \gamma (x - vt) = \frac{x - vt}{\sqrt{1 - \frac{v^2}{\alpha^2}}} = \frac{x - vt}{\sqrt{1 - \frac{v^2}{c^2}}}$$ RELATIVITÀ

$\vec{B}$



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

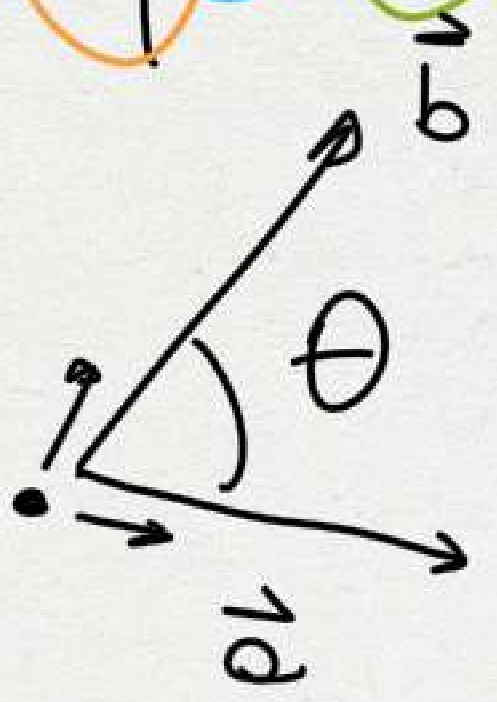
① $|\vec{c}| = ab\sin\theta$

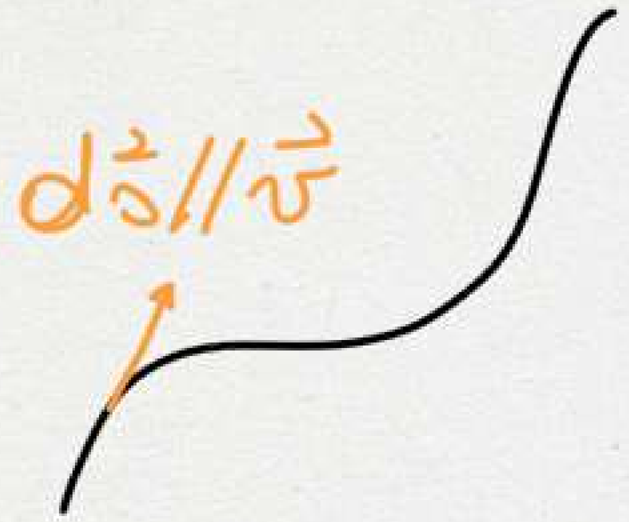
② $\vec{a}\times\vec{b} = -\vec{b}\times\vec{a}$

③ $\vec{c}\perp\vec{a}\,,\ \vec{c}\perp\vec{b}$

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

$$\vec{F}_L = q\vec{v}\times\vec{B}$$





FORZA DI LORENTZ

$\cdot$ ESCONO $\quad\times$ ENTRANO

$$W = \int_P^Q \vec{F}_L\cdot d\vec{s} = \Delta U_K = \frac{1}{2}mv_Q^2 - \frac{1}{2}mv_P^2$$

$$W = q\int_P^Q (\vec{v}\times\vec{B})\cdot d\vec{s} = 0 \implies$$

$v_P = v_Q$ la forza di Lorentz non cambia <u>il modulo</u> di $\vec{v}$

$$\vec{F}_L = q\vec{v} \times \vec{B}$$

$$[F_L] = [q][v][B] \Rightarrow$$

$$[B] = \frac{Ns}{Cm} = \frac{Kg}{As^2} = T \quad \text{TESLA}$$

$$G = 10^{-4}\,T \quad \text{GAUSS}$$

$$B_T \sim 0.4\ G$$

n densità di elettroni

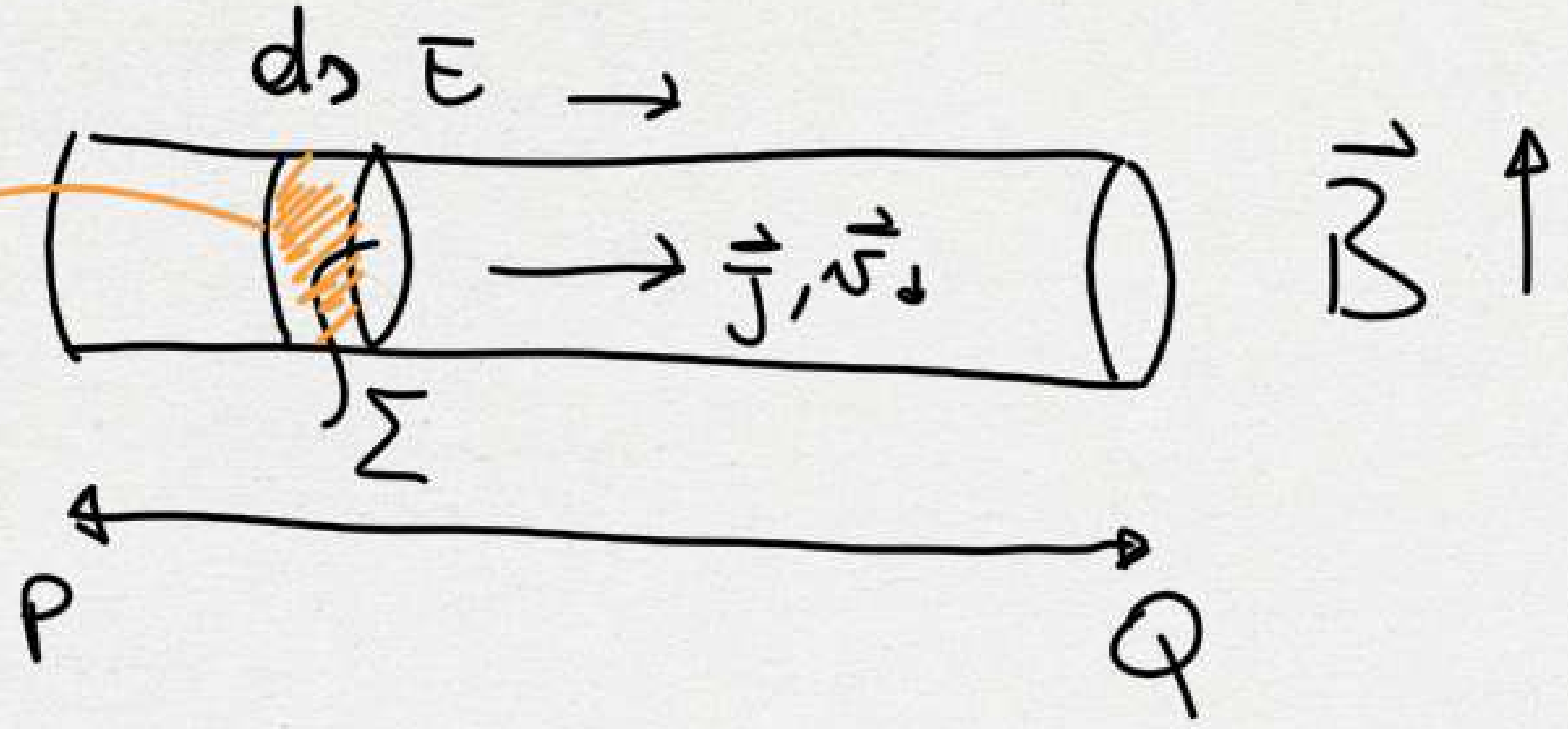
$-e$ carica

$\vec{v}_d$

$\vec{J} = -ne\vec{v}_d$

$i = J\Sigma$

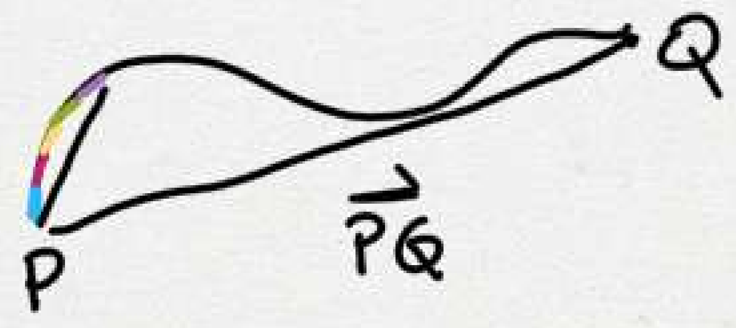
$d\tau = ds\Sigma$

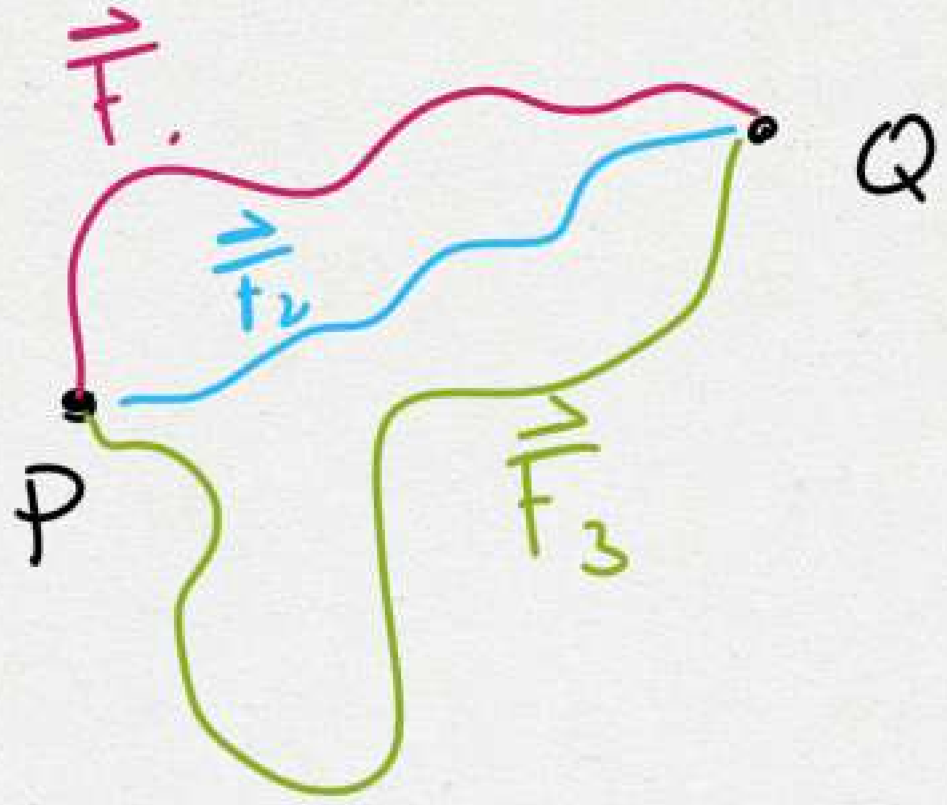


$\vec{F}_L = -e\vec{v}_d \times \vec{B}$

$d\vec{F} = \vec{F}_L \, dN_e = n\Sigma ds\left(-e\vec{v}_d \times \vec{B}\right) = \Sigma ds \, \vec{J} \times \vec{B} = i \, d\vec{s} \times \vec{B}$ II LEGGE ELEMENTARE DI LAPLACE

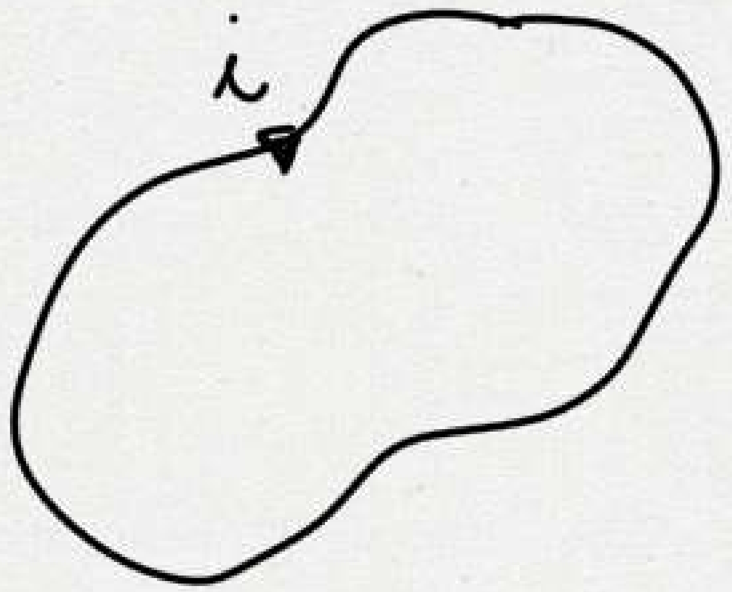
$$\vec{F} = \int_P^Q i \, d\vec{s} \times \vec{B} = i \int_P^Q d\vec{s} \times \vec{B} \xrightarrow[\vec{B}\ \text{UNIFORME}]{} i\left[\int_P^Q d\vec{s}\right] \times \vec{B} = i \, \vec{PQ} \times \vec{B}$$



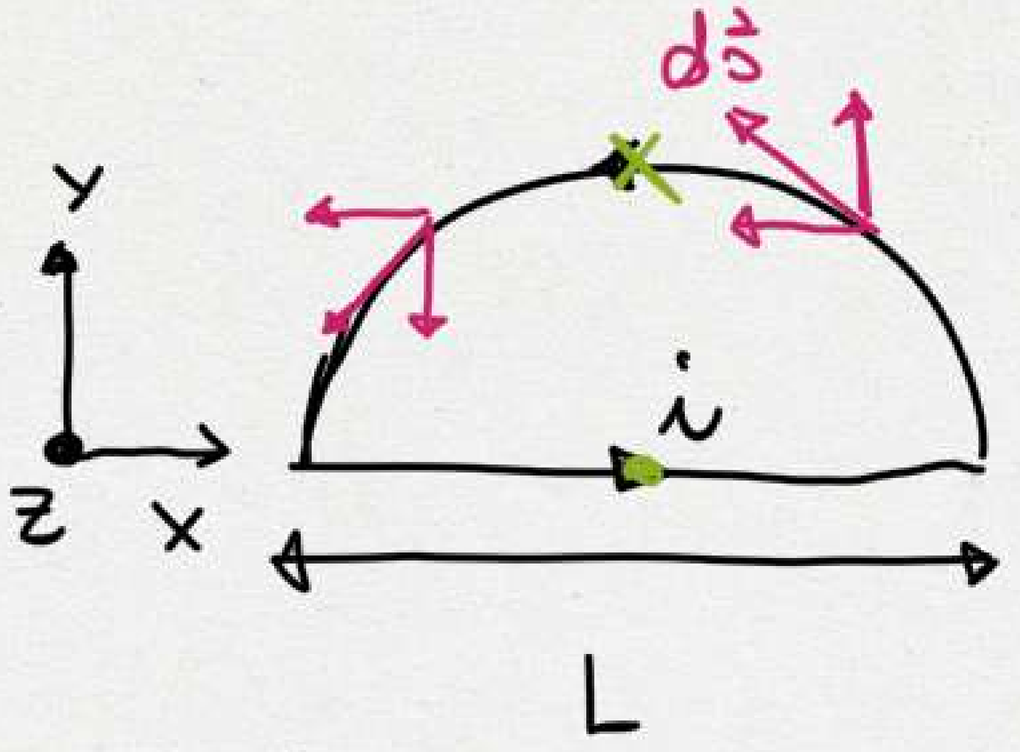


$$\vec{F}_1 = \vec{F}_2 = \vec{F}_3$$

SE $\vec{B}$ É UNIFORME



$$\vec{F} = i\left[\oint d\vec{s}\right]\times\vec{B} = 0$$



$\vec{B} \uparrow$

$$\vec{F} = \vec{F}_R + \vec{F}_s = i\int_{RETT.} d\vec{s} \times \vec{B} + i\int_{SEMI} d\vec{s} \times \vec{B}$$

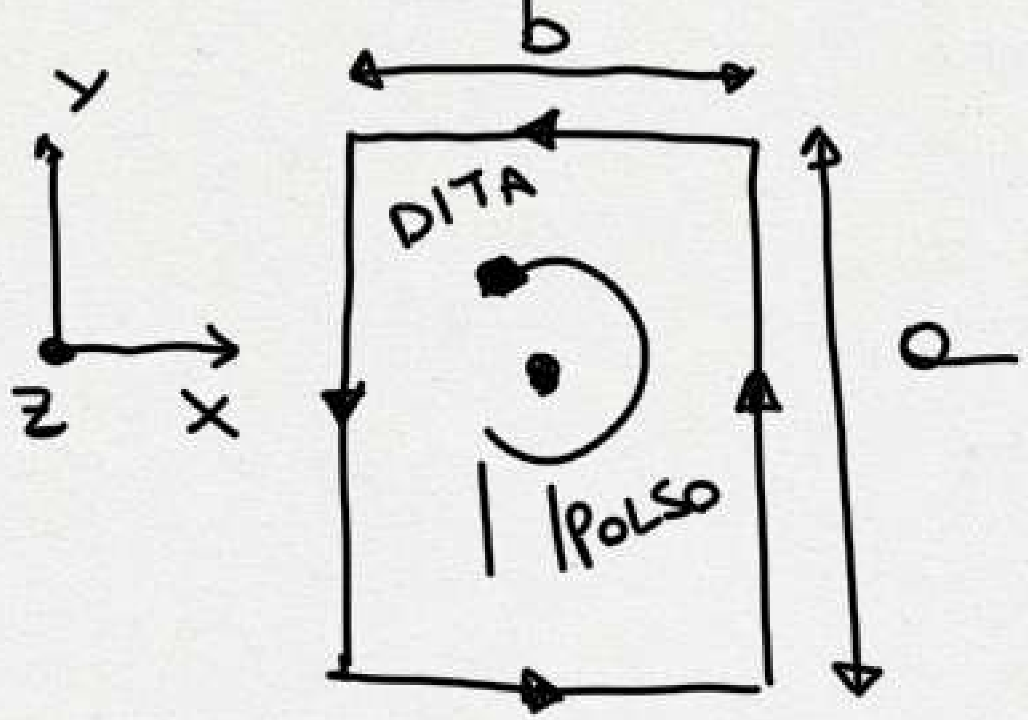
$$\vec{F}_R = i\int_{RETT} dx\, B\, \hat{z}$$

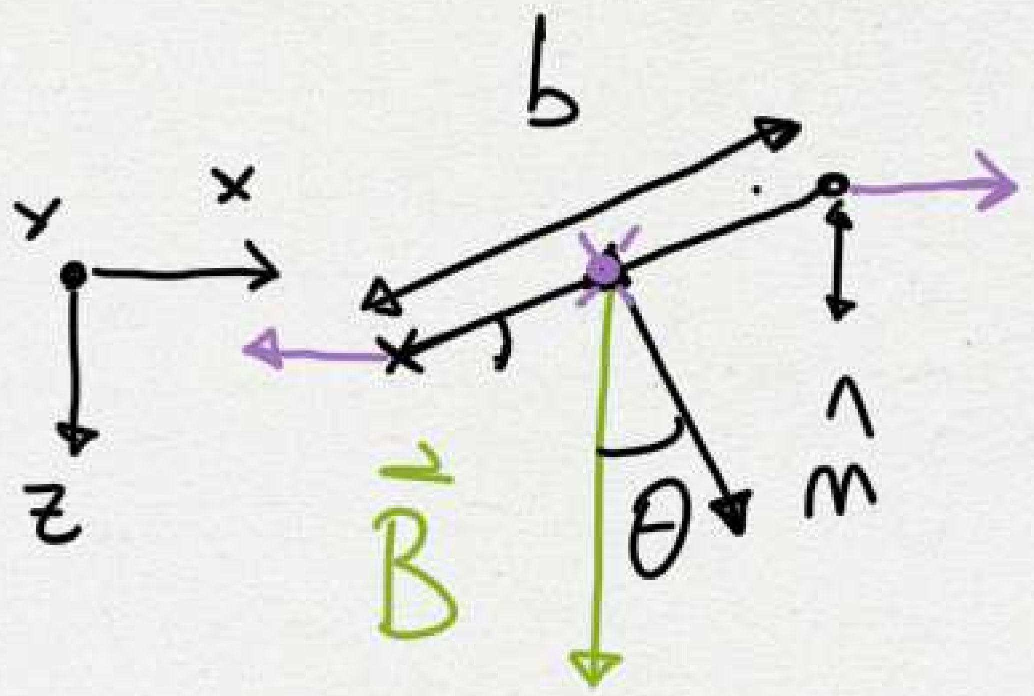
$$\vec{F}_s = i\int_{SEMI} d\vec{s} \times \vec{B} = i\int_{SEMI} (-d\vec{x} \pm d\vec{y}) \times \vec{B} = i\int_{SEMI} \left[(-d\vec{x}) \times \vec{B} + \underbrace{\cancel{(\pm d\vec{y}) \times \vec{B}}}_{} \right] =$$

$$\cancel{(\pm d\vec{y}) \times \vec{B}} = 0$$

$$= -i\int_{SEM} dx\, B\, \hat{z}$$

$$\left.\begin{aligned} \vec{F}_R &= iLB\,\hat{z} \\ \vec{F}_s &= -iLB\,\hat{z} \end{aligned}\right\} \quad \vec{F} = 0$$

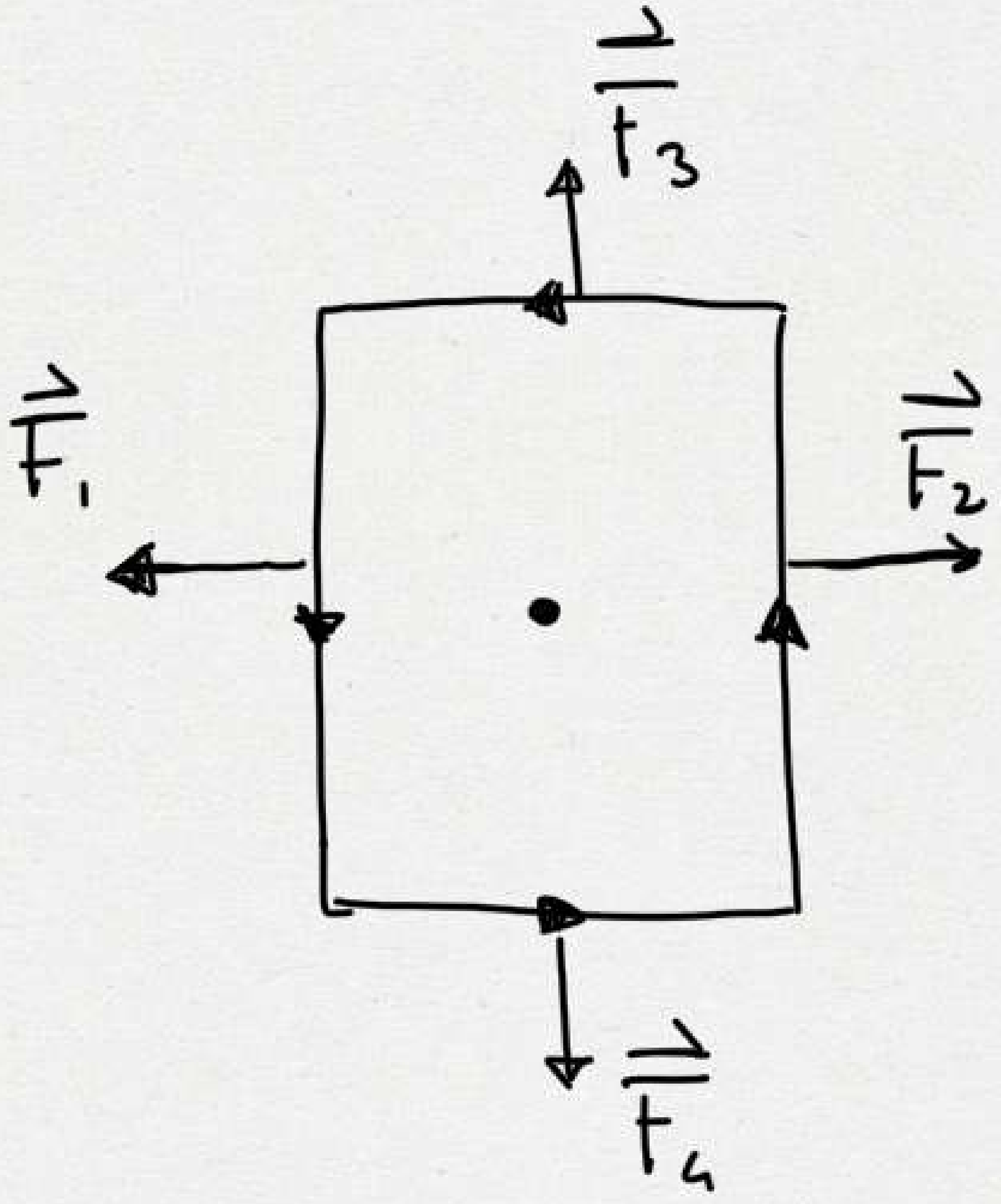




$$F = i(PQ)B$$

$$\Sigma = ab$$

$$\vec{M} = \vec{p} \times \vec{E}$$



$$M = F_1\, b \sin\theta = i\, a B b \sin\theta = i \Sigma B \sin\theta$$

$$\vec{m} \equiv i \Sigma \hat{n} \implies$$

$$\begin{cases} \vec{M} = \vec{m} \times \vec{B} \\ U_m = -\vec{m} \cdot \vec{B} = -mB\cos\theta \end{cases}$$

FORMULE GENERALI

$$\frac{d\vec{L}}{dt} = \vec{M} \quad , \quad M = I\alpha = I\frac{d^2\theta}{dt^2}$$

$$[m] = A\, m^2 = \frac{J}{T}$$