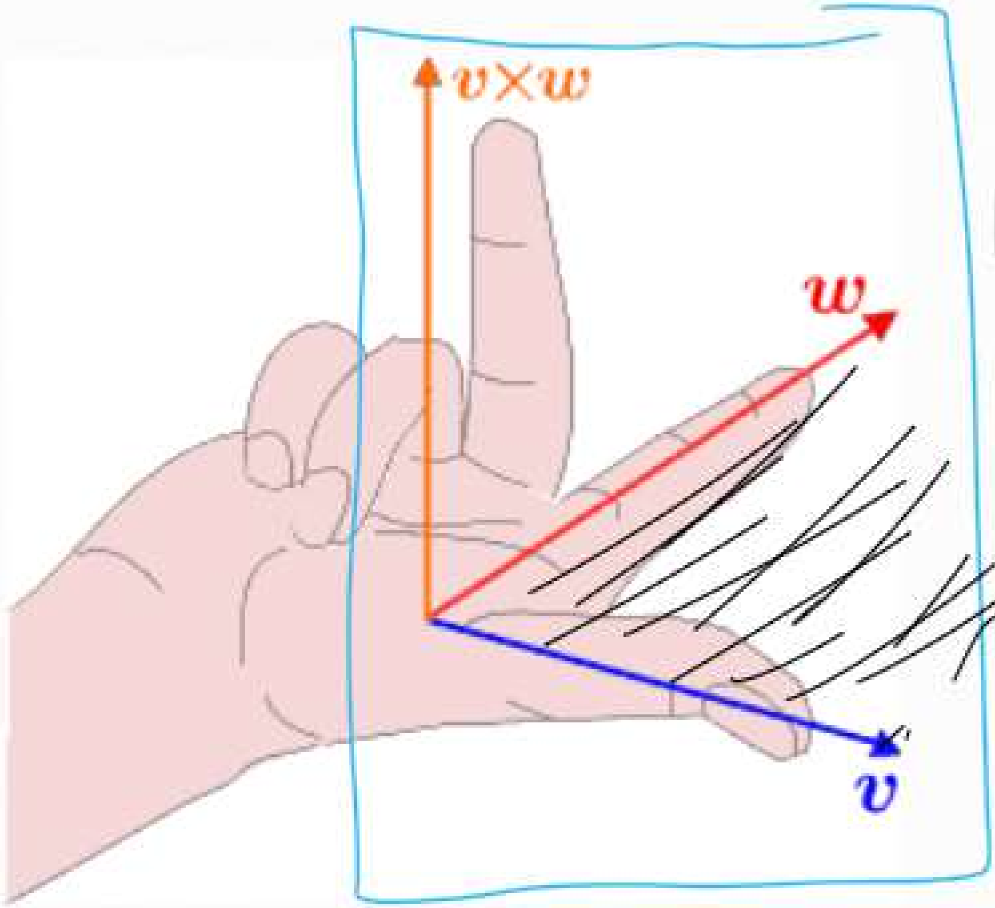


$$\boxed{\vec{v} \times \vec{w} = \vec{c}}$$

- $\vec{v} \times \vec{w} = -\vec{w} \times \vec{v}$

- $|\vec{v} \times \vec{w}| = v w \sin\theta$

① $\vec{v} \times \vec{w} = 0 \Leftrightarrow \vec{v} \parallel \vec{w}$, $\vec{v} \cdot \vec{w} = v w$

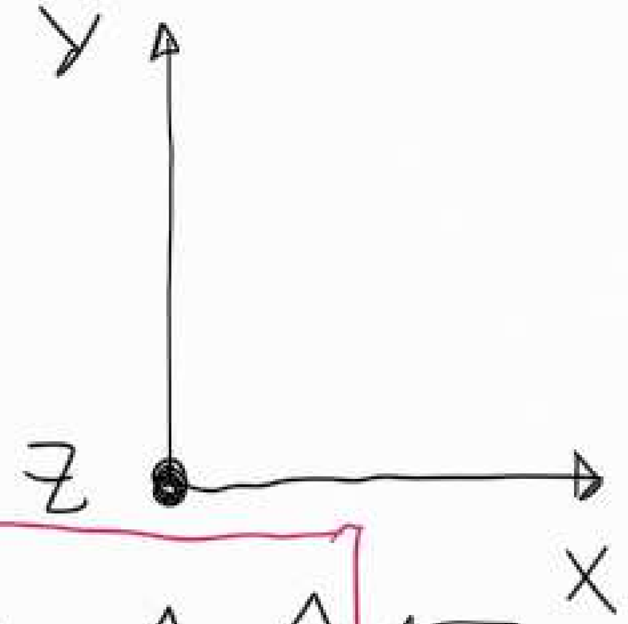
② $|\vec{v} \times \vec{w}| = v w \Leftrightarrow \vec{v} \perp \vec{w}$, $\vec{v} \cdot \vec{w} = 0$

- $\vec{v} \times \vec{w} = \vec{c} \Rightarrow \vec{c} \perp \vec{v}$, $\vec{c} \perp \vec{w}$

$$\Updownarrow$$

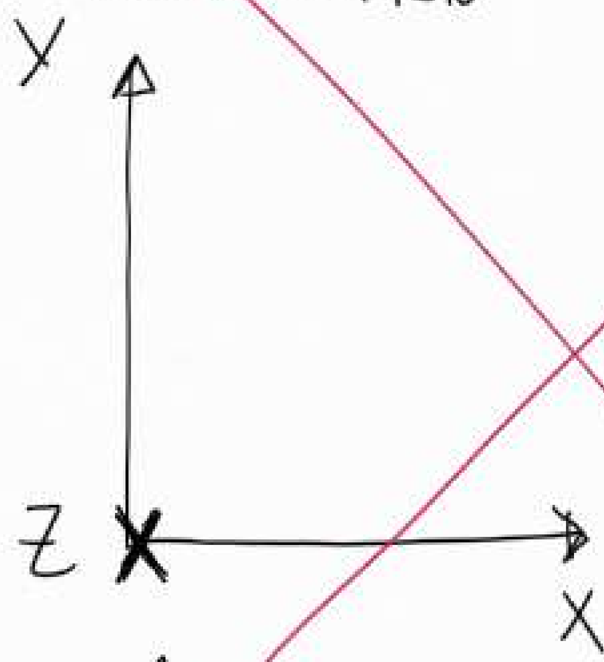
$\vec{c} \cdot \vec{v} = 0$, $\vec{c} \cdot \vec{w} = 0$

DESTROGIRO



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

LEVOGIRO



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

$$\vec{v} = a\hat{x} + b\hat{y} + c\hat{z}$$

$$\vec{w} = d\hat{x} + e\hat{y} + f\hat{z}$$

I $\boxed{\hat{x} \times \hat{x} = \hat{y} \times \hat{y} = \hat{z} \times \hat{z} = 0}$

II $\boxed{\begin{aligned} \hat{x} \times \hat{y} &= \hat{z} \\ \hat{y} \times \hat{z} &= \hat{x} \\ \hat{z} \times \hat{x} &= \hat{y} \end{aligned}}$

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

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

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

$\vec{B} = (B_x, B_y, B_z)$, q, $\vec{v} = (v_x, v_y, v_z)$

1) per quali condizioni $\vec{F}_L \parallel \hat{x}, \hat{y}, \hat{z}$

2) $\vec{B} = (3, 15, -1)\ G$. Applicare le relazioni precedenti.
   Hanno soluzione?

3) Per quali condizioni la particella si muove su di un piano?

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

1) $\boxed{\vec{F}_L \parallel \hat{x}}$

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

$$= q\left[v_xB_y\hat{z} - v_xB_z\hat{y} - v_yB_x\hat{z} + v_yB_z\hat{x} + v_zB_x\hat{y} - v_zB_y\hat{x}\right]$$

$$= q\left[(v_yB_z - v_zB_y)\hat{x} + (v_zB_x - v_xB_z)\hat{y} + (v_xB_y - v_yB_x)\hat{z}\right]$$

$$\begin{cases} q(v_yB_z - v_zB_y) > 0 \\ v_zB_x - v_xB_z = 0 \\ v_xB_y - v_yB_x = 0 \end{cases}$$

$$\vec{B} = (3, 15, -1) =$$

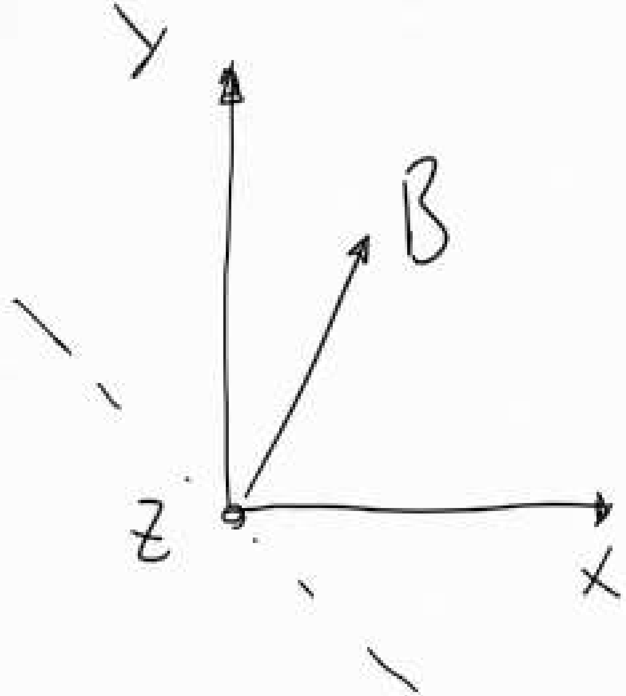
$$= 3\hat{x} + 15\hat{y} - \hat{z}$$

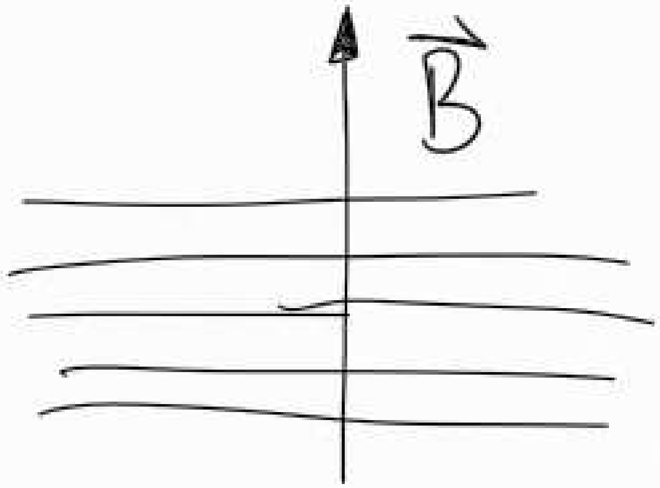
$$\vec{c} = \vec{a} \times \vec{b} \Rightarrow \vec{c} \perp \vec{a},\ \vec{c} \perp \vec{b}$$

$$\vec{F} = q\vec{v} \times \vec{B} \Rightarrow \vec{F} \perp \vec{v},\ \vec{F} \perp \vec{B}$$

SE $\vec{B} = 3\hat{x} + 15\hat{y} - \hat{z}$

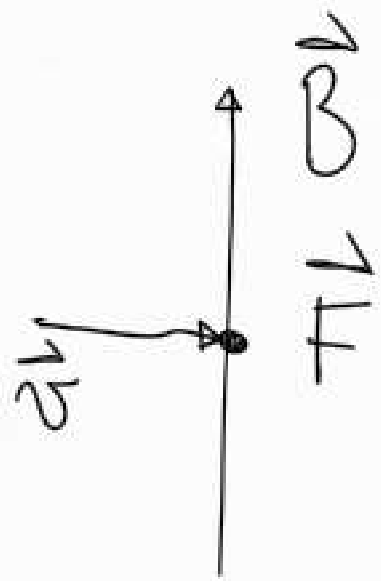
$\boxed{\vec{F} \perp \vec{B}} \Rightarrow \vec{F}$ non può essere // $\hat{x}$

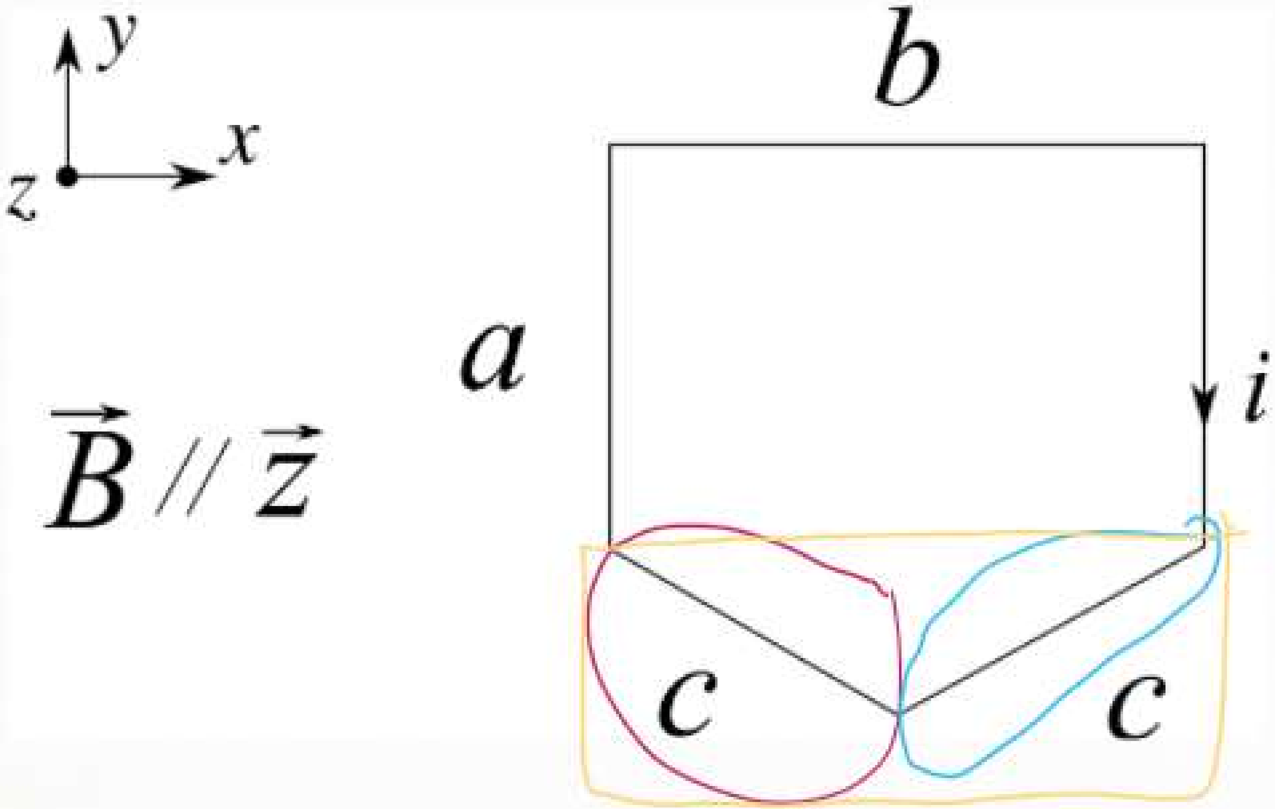




la traiettoria si svolge sul piano $\iff$

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



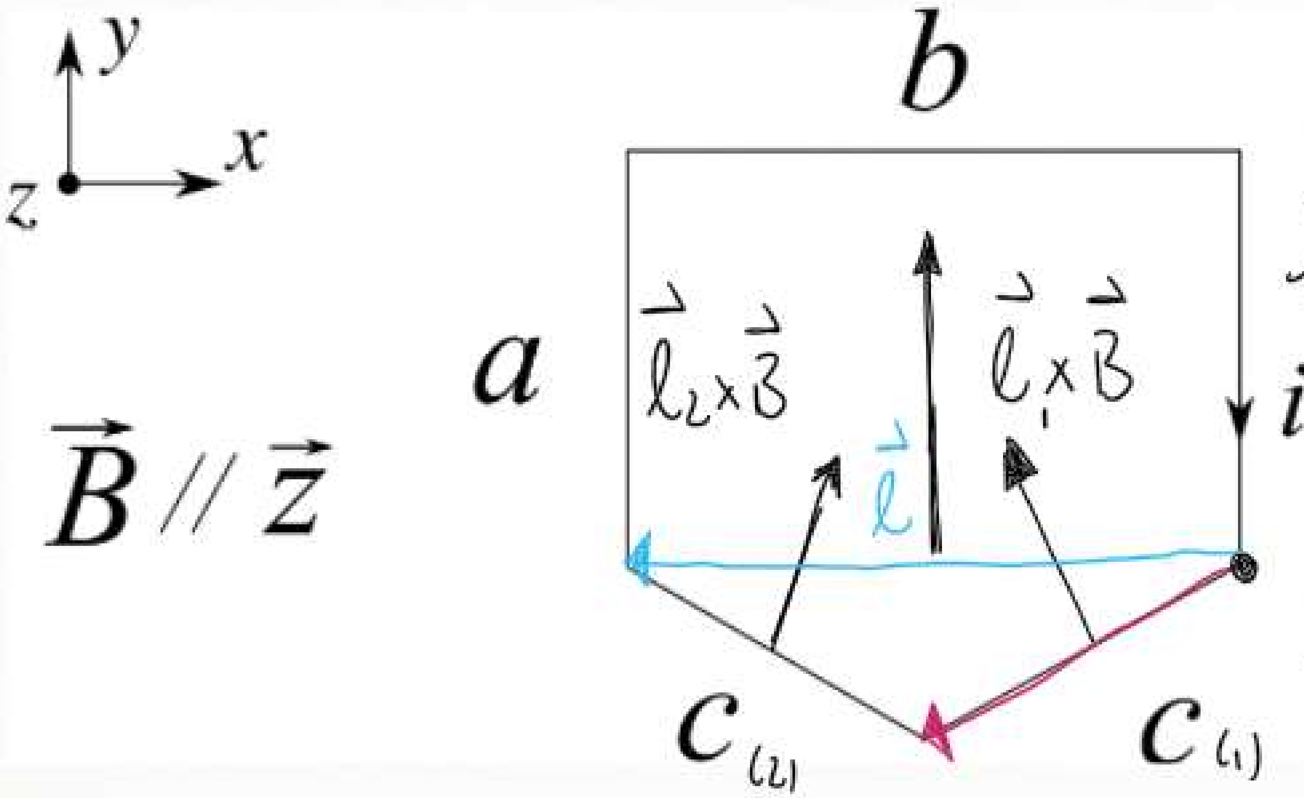


$$\boxed{\vec{F} = i\,\vec{\ell} \times \vec{B}}$$

1) determinare le forze agenti sui segmenti diagonali

2) " " " " sulla parte inferiore (in giallo)

3) $\vec{F}_{TOT} = ?$

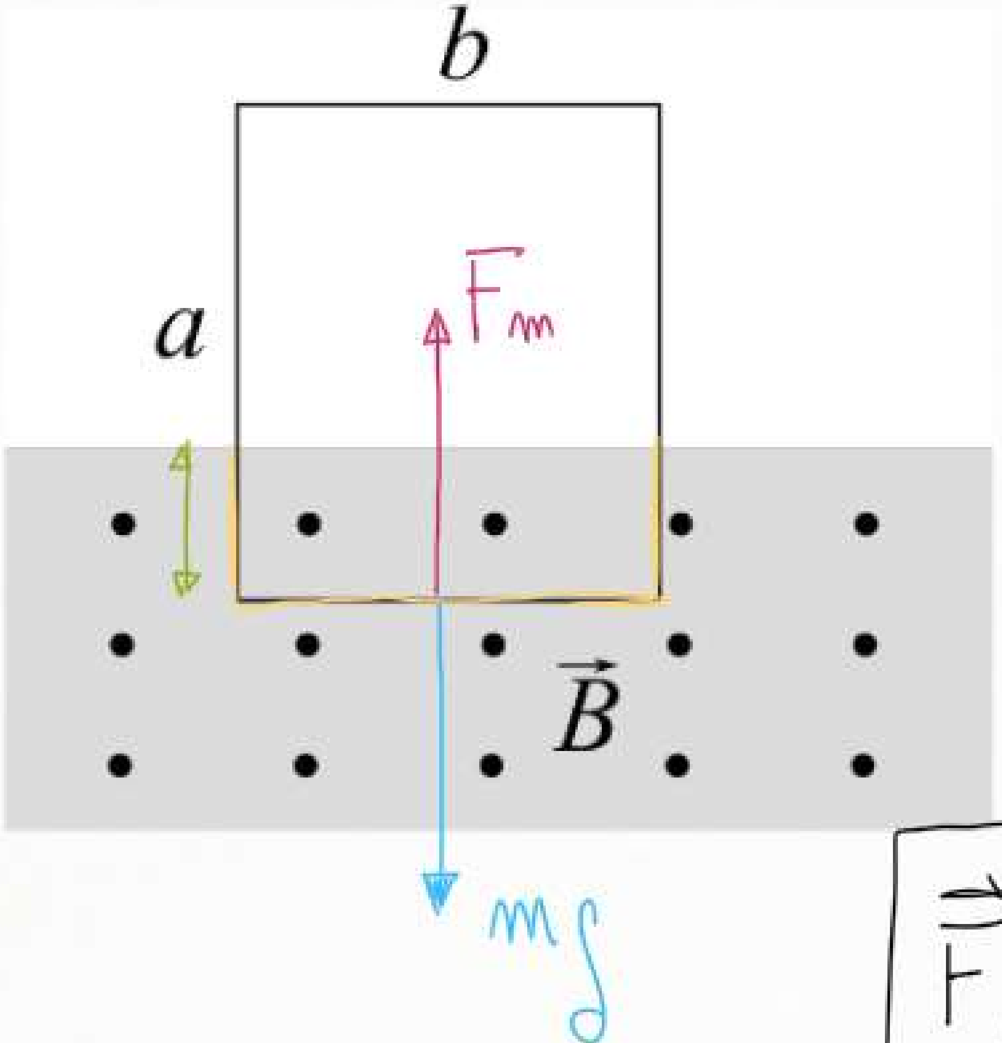


$$\vec{F} = i\,\vec{l} \times \vec{B}$$

1) $\boxed{F_1 = F_2 = i\,c\,B}$

2) $\vec{F}_b = i\,\vec{l} \times \vec{B} = i\,b\,B\,\hat{y}$

3) $\vec{F}_{TOT} = 0$



$a = 3$ cm, $b = 2$ cm, $m = 4 \cdot 10^{-2}$ g

$|i| = 1$ A

1) il verso della corrente

2) $|\vec{B}| = ?$

$$\boxed{\vec{F}_m = i\vec{l} \times \vec{B}}$$

$$F_m = mg$$