

LE FORZE

• Vettori

(freccia)

intensità

(valore numerico)

direzione

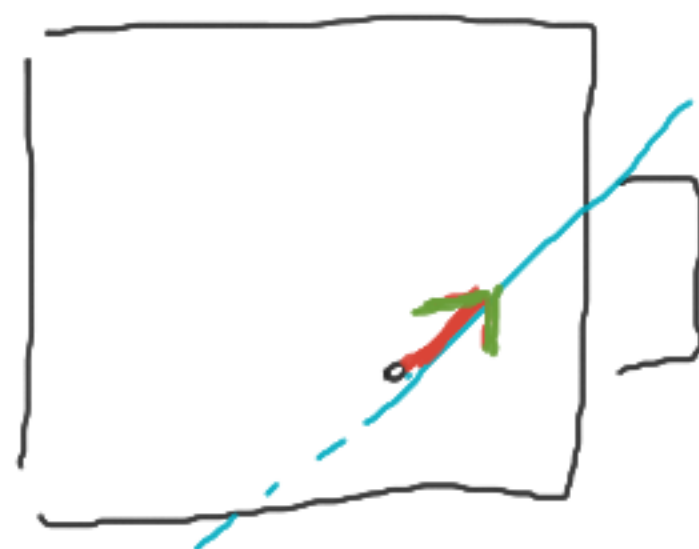
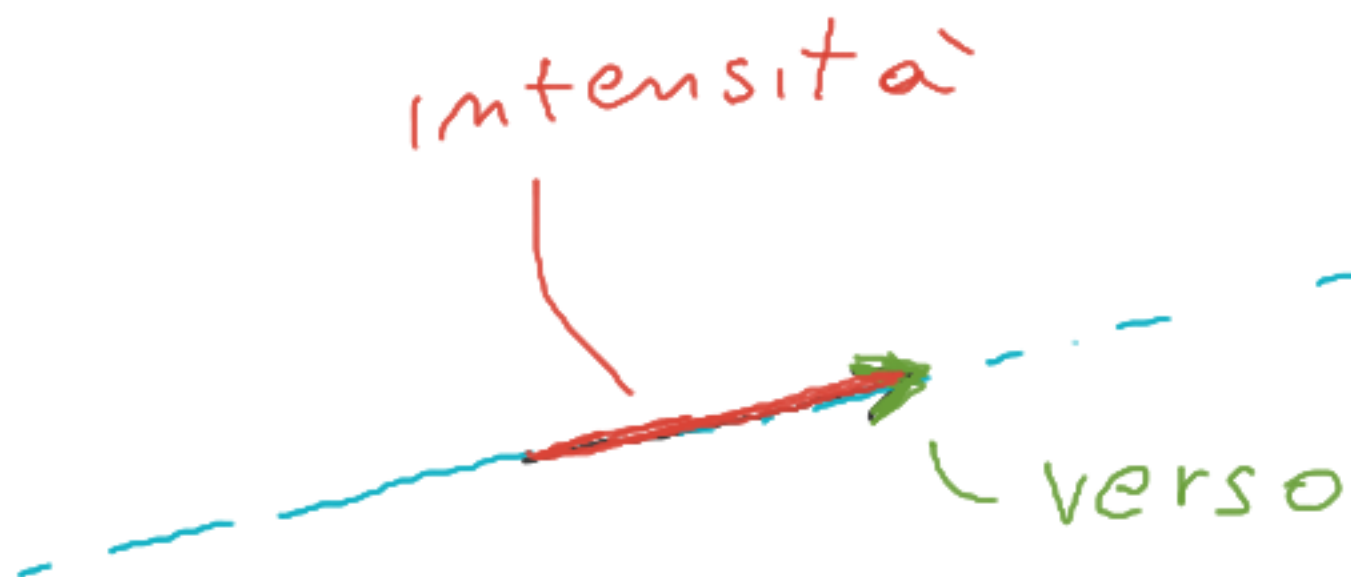
(retta su cui
si trova il
vettore)

verso

intensità

direzione

verso



- grandezze
vettoriali
(Forze, velocità, ecc.)

- grandezze
scalari (Temperatura, tempo ...)

(mi interessa
solo il valore
numerico \Rightarrow NO VETTORE)

- Quando ho a che fare con una grandezza vettoriale, devo indicare il simbolo di vettore (una freccia) sopra la grandezza stessa
es:

vettori $\vec{F} = 10 \text{ N}$

$$\vec{v} = 1 \text{ m/s}$$

$$\vec{a} = 0,5 \text{ m/s}^2$$

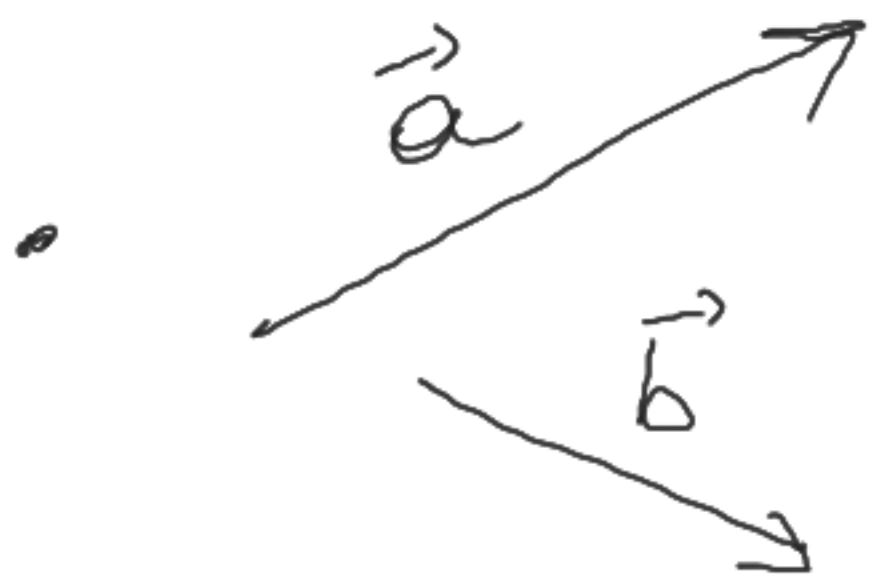
solo
intensità $F = 10 \text{ N}$

$$v = 1 \text{ m/s}$$

$$a = 0,5 \text{ m/s}^2$$

Operazioni con i vettori

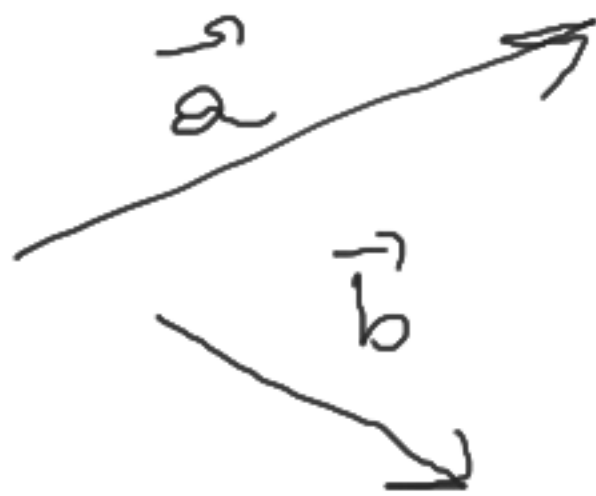
→ SOMMA $\vec{c} = \vec{a} + \vec{b}$



\Rightarrow



Metodo
Parallelogramma
ma



\Rightarrow



Metodo
punta-coda

MOLTIPLICAZIONE VETTORE • NUMERO

\vec{a}



$2\vec{a}$



$\times 2$

$\frac{1}{2}\vec{a}$



$\times \frac{1}{2}$

$-2\vec{a}$

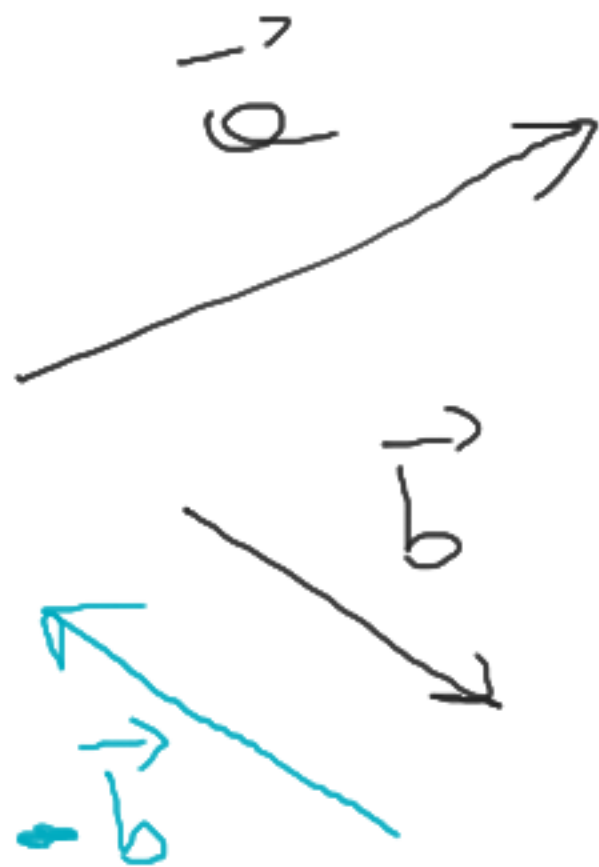


$\times -2$

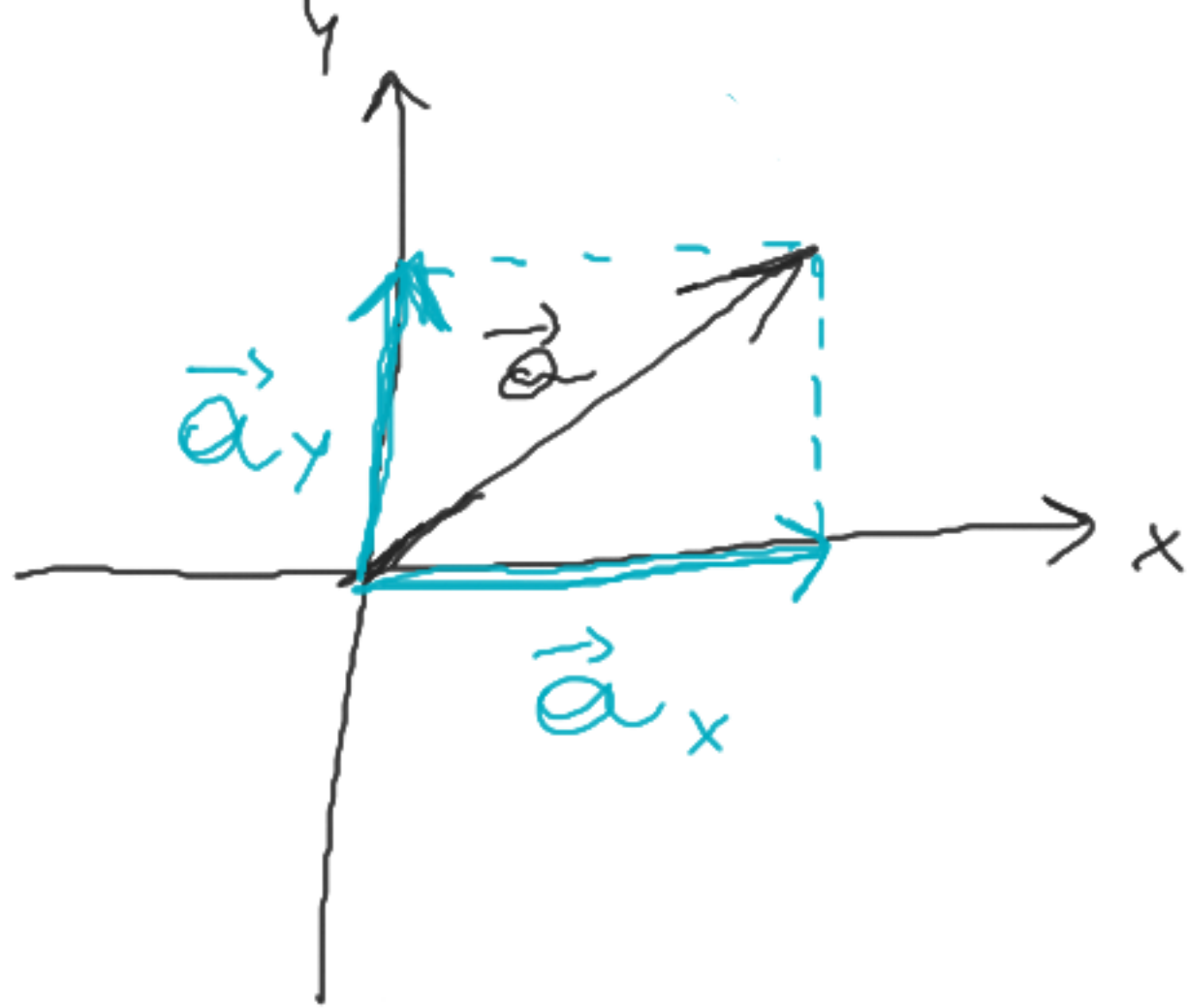
- DIFFERENZA

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

$$\vec{c} = \vec{a} + (-\vec{b})$$

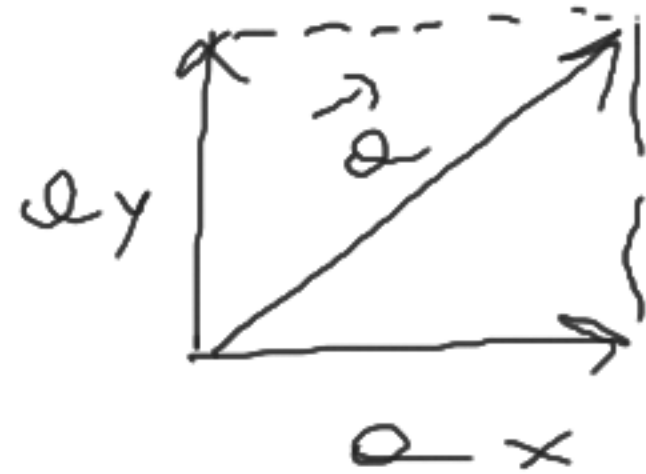


- Scomposizione



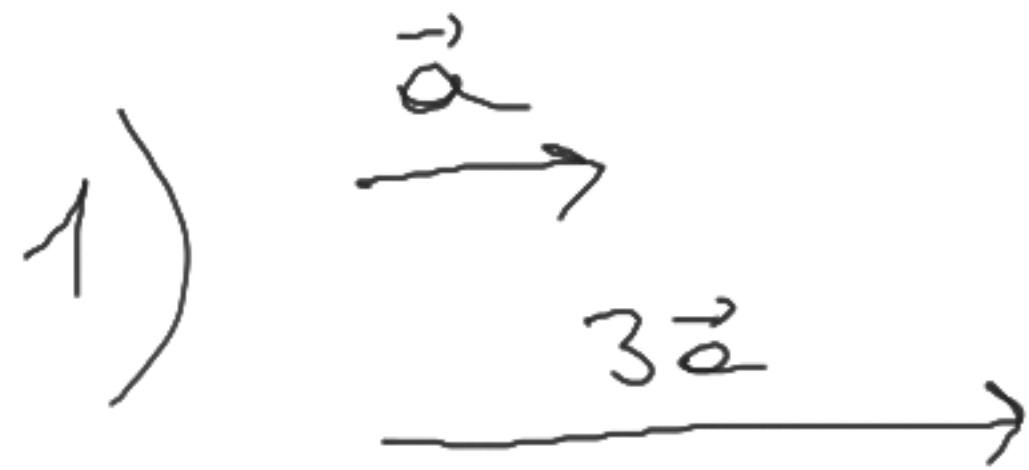
Note:

$$\vec{a} = \vec{a}_x + \vec{a}_y$$

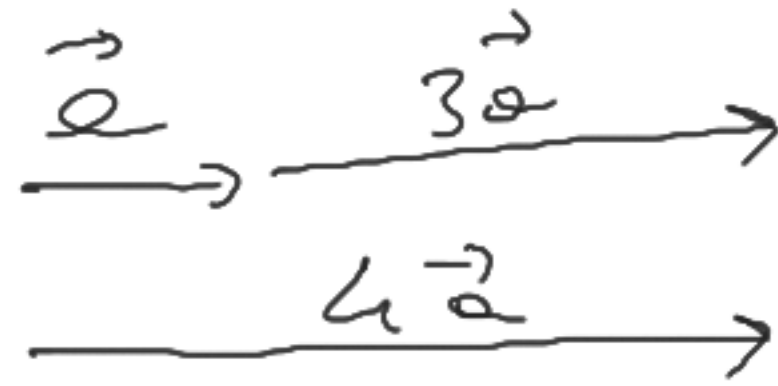


(Regola
Parallelogramma)

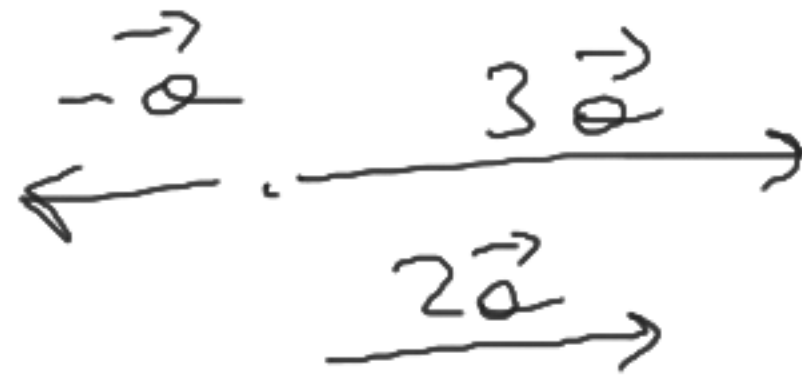
- CASI FACILI



SOMMA



DIFF

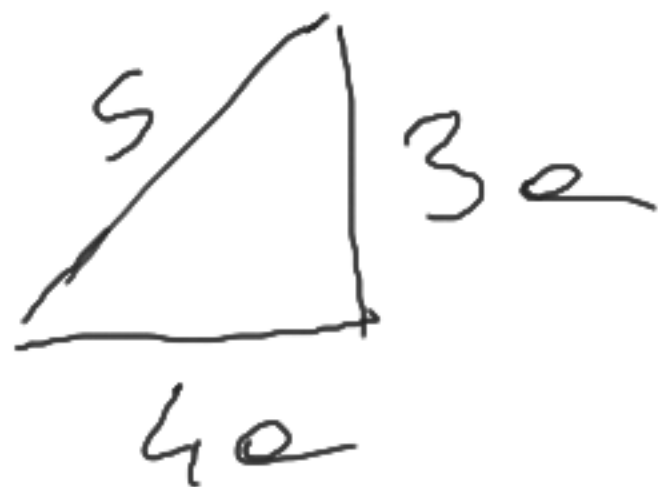
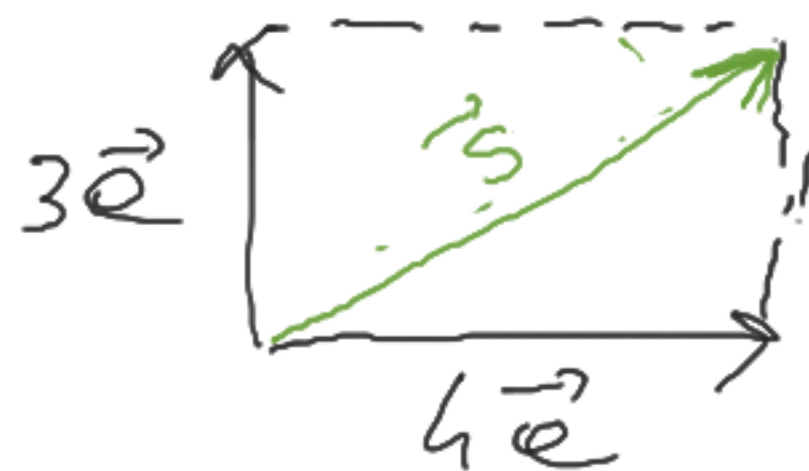


(VETTORI PARALLELI)

2)

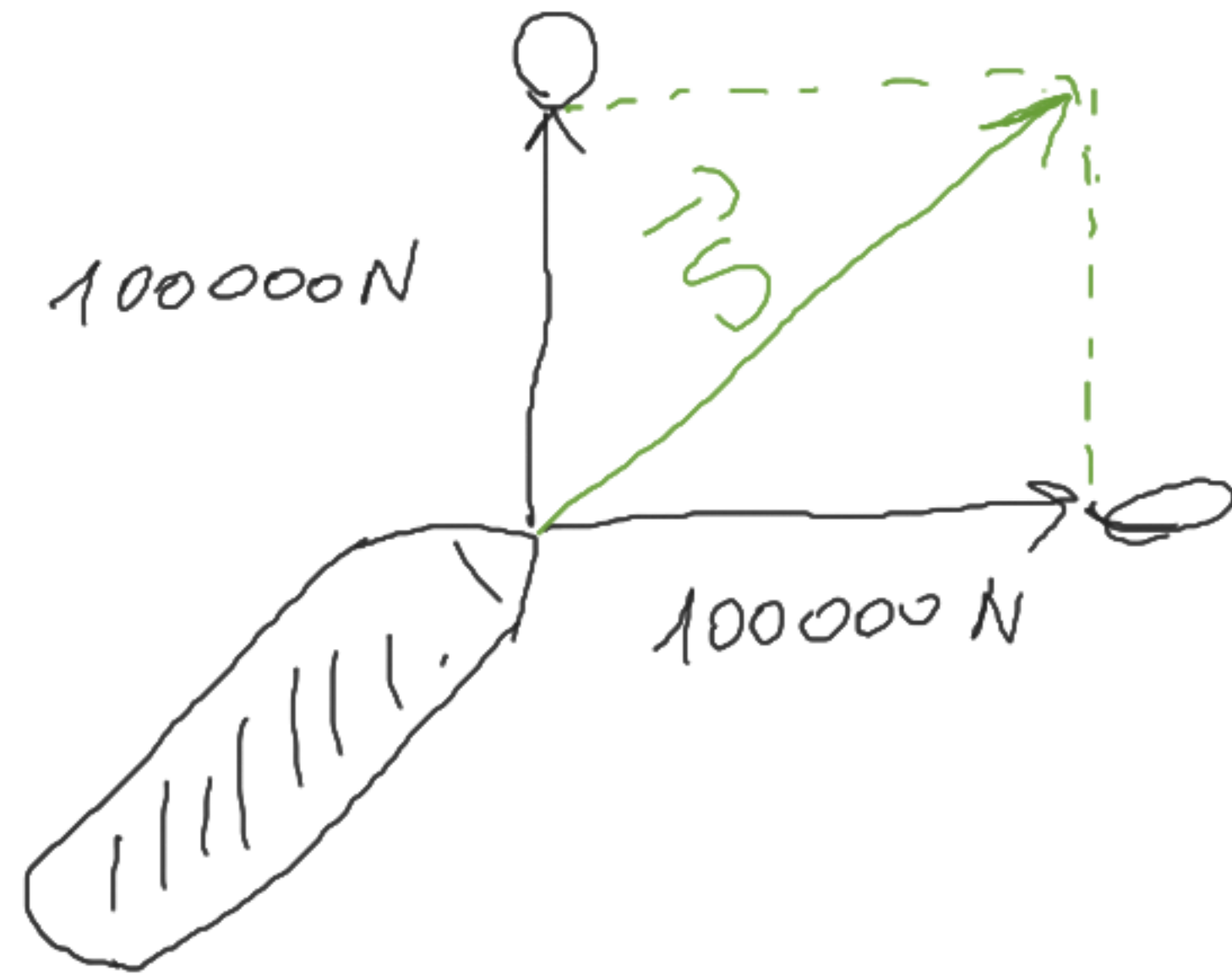
VETTORI

PERPENDICOLARI



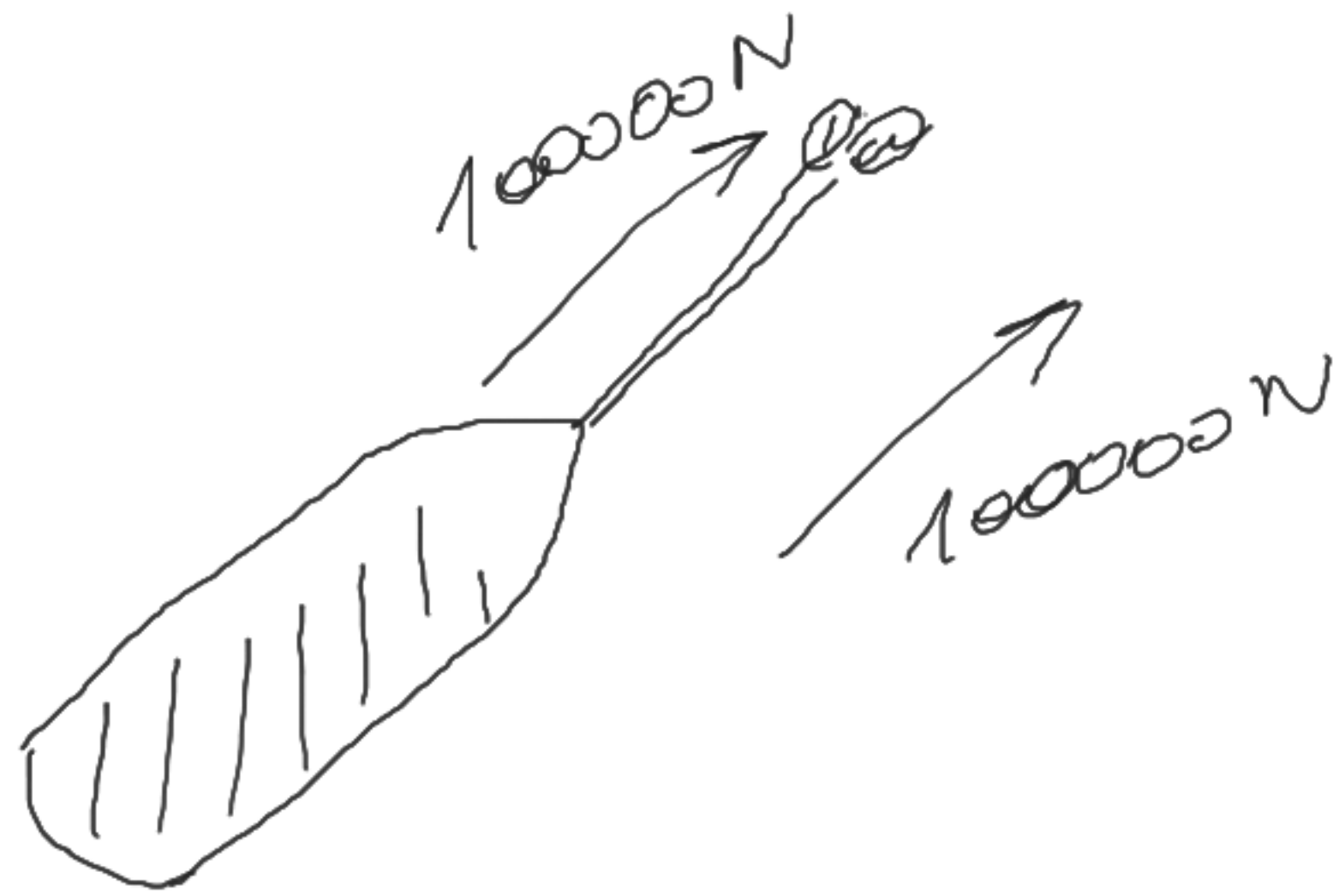
$$\vec{S} = 5a$$

$$\begin{aligned} S &= \sqrt{9a^2 + 16a^2} \\ &= \sqrt{25a^2} \\ &= 5a \end{aligned}$$



VETTORI
PERPENDICOLARI

$$\begin{aligned} \vec{S} &= \sqrt{(10^5)^2 + (10^5)^2} = \sqrt{10^{10} + 10^{10}} \\ &= \sqrt{2 \cdot 10^{10}} = 10^5 \cdot \sqrt{2} \text{ N} \sim \underline{\underline{141000 \text{ N}}} \end{aligned}$$



FORZE
PARALLELE

$$\vec{S} = 100000 + 100000 = \underline{200000 \text{ N}}$$