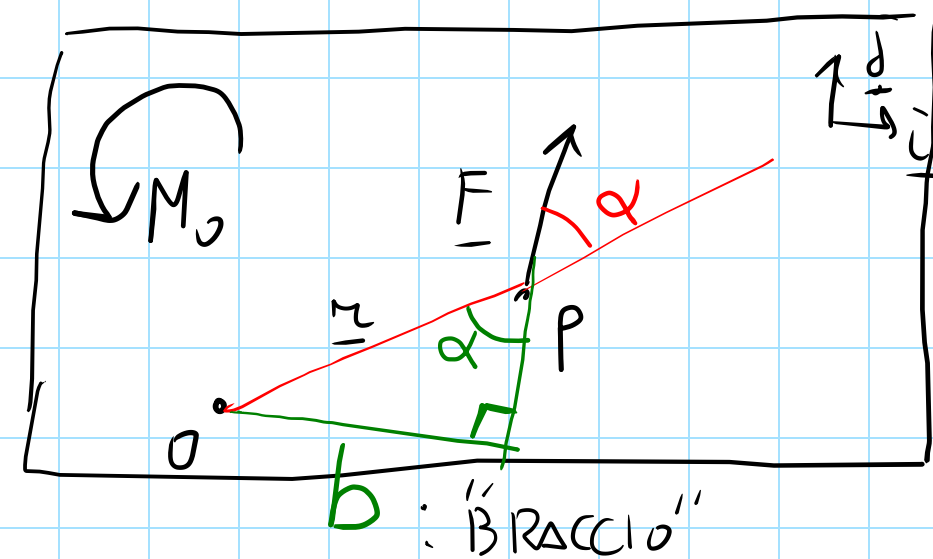
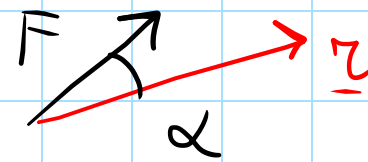
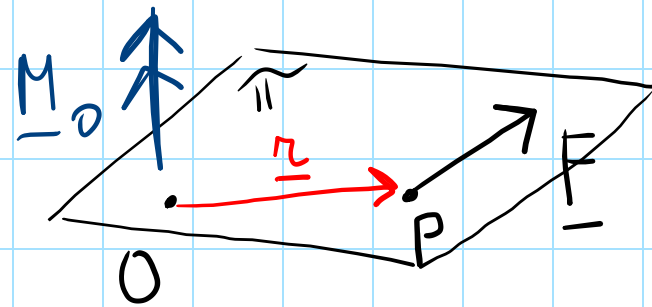


NOTA: CALCOLO DEI MOMENTI IN UN SIST. PIANO

$\underline{M}_O = \underline{r} \times \underline{F}$; MOM DI UNA FORZA $\underline{F}$ RISPETTO AL PUNTO O

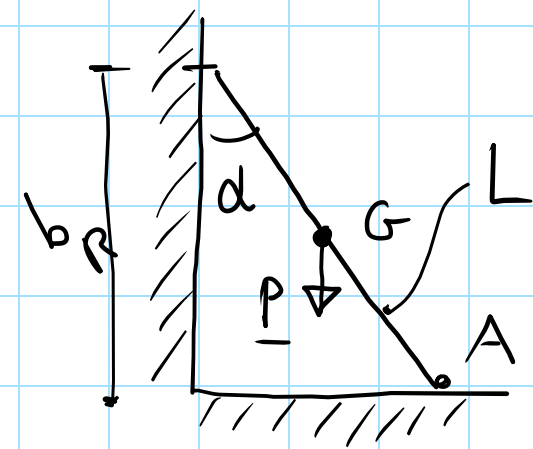


$$\underline{M}_O \perp \pi(\underline{r}, \underline{F})$$

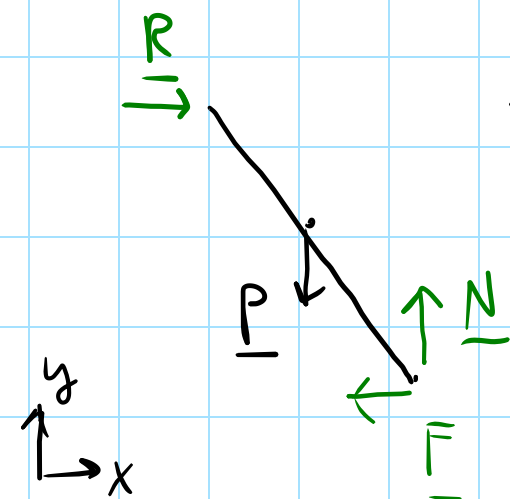
$$|\underline{M}_O| = |\underline{r}| |\underline{F}| \sin \alpha = |\underline{F}| b$$

$$\underline{M}_O = \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ r_x & r_y & r_z \\ F_x & F_y & F_z \end{vmatrix}$$

ES SCAIA (PAVIM. CON ATTRITO)



QUAL È IL MINIMO
COEFF. D'ATTRITO
CHE DEVE AVERE
IL PAVIMENTO
PER GARANTIRE
L'EQUILIBRIO



$$\rightarrow \sum F_x = 0 : R - F = 0$$

$$\uparrow \sum F_y = 0 : -P + N = 0$$

$$\sum M_A = 0 : -R \cdot L \cos \alpha + P \cdot \frac{L}{2} \sin \alpha = 0$$

SIST. LINEARE : UNICA SOLUZ.

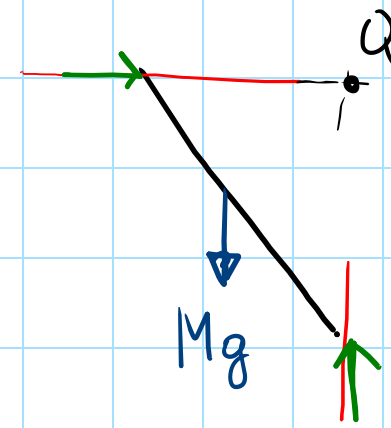
$$N = P$$

$$R = \frac{P}{2} \tan \alpha$$

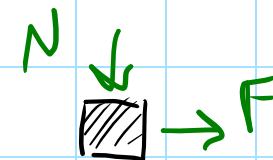
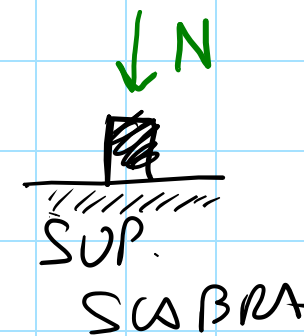
$$F = \frac{P}{2} \tan \alpha$$

$$\mu_{\min} = \frac{F}{N} = \frac{P}{2} \tan \alpha \cdot \frac{1}{P} = \frac{\tan \alpha}{2}$$

CASO VINCOLI Lisci

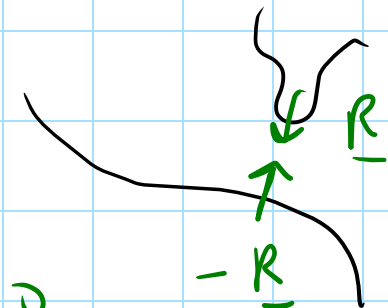
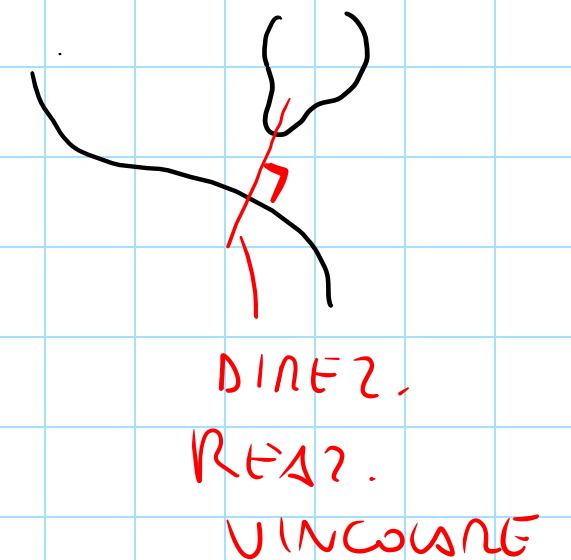
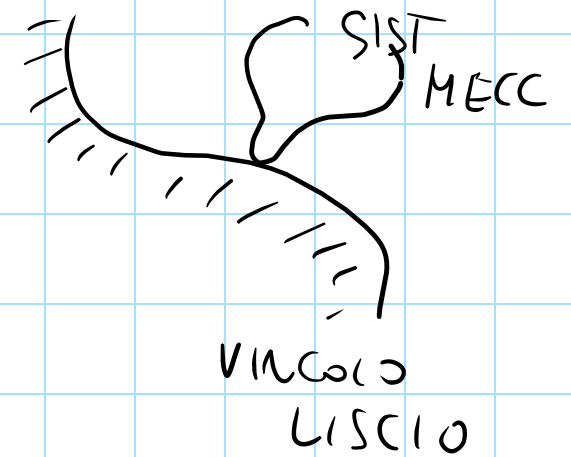


EQUIL.
IMPOSS.
(NO BILANCIO
DEI
MOMENTI)



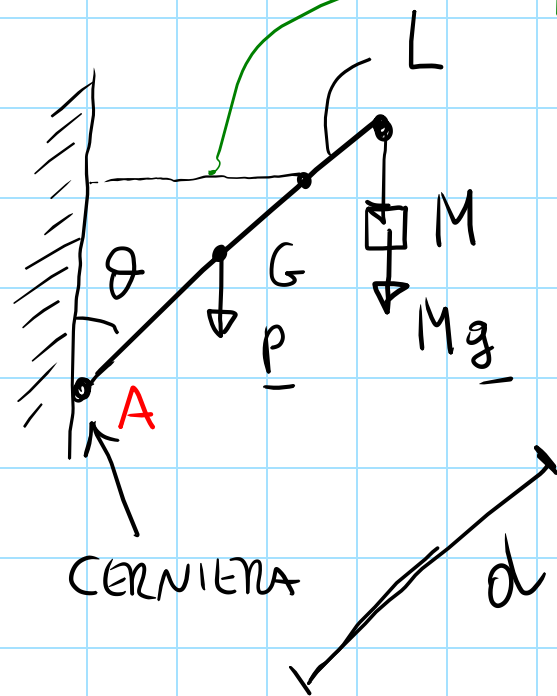
IN EQUILIBRIO STATICO

SE $F \leq \mu N$; μ : COEFF DI
ATTRITO

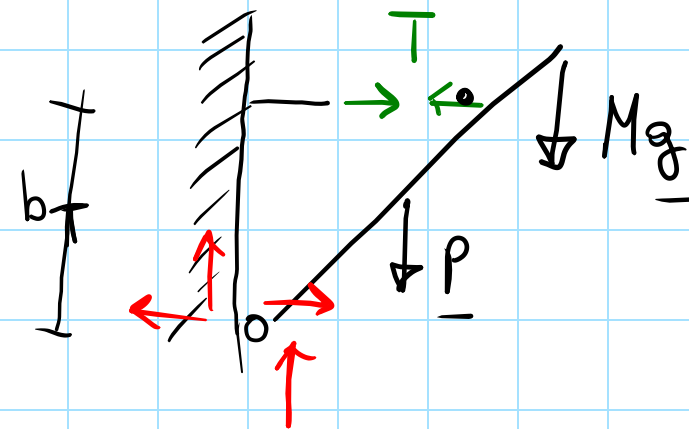


ES : VARIANTE SOLA

FILLO INESTENSIBILE (T_{max} : FORZA MASSIMA)



QUAL È IL VALORE DI M CHE PORTA A ROTURA IL FILLO

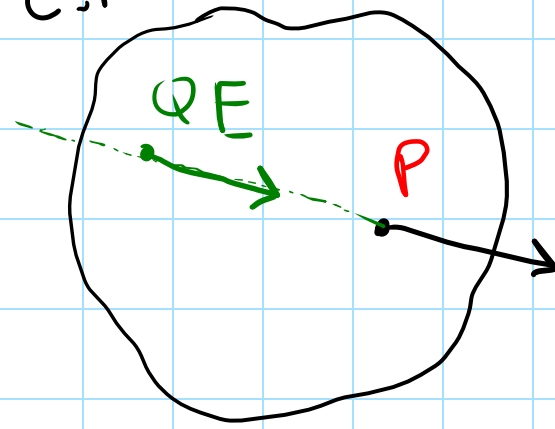


PER CALCOLARE UNICAMENTE T
SCELGO A COME POLO DI RIDUZ.
DEI MOMENTI

$$\begin{aligned} + \sum M_A : -P \frac{L}{2} \sin \theta - Mg L \sin \theta + T d \cos \theta &= 0 \Rightarrow M_{max} \text{ si ottiene da} \\ -P \frac{L}{2} \sin \theta - M_{max} g L \sin \theta + T_{max} d \cos \theta &= 0 \end{aligned}$$

EQUIVALENZA DEL SIST. DI VETTORI

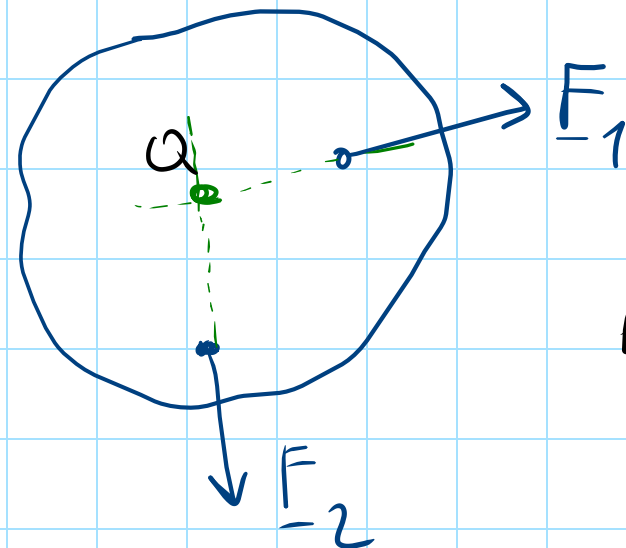
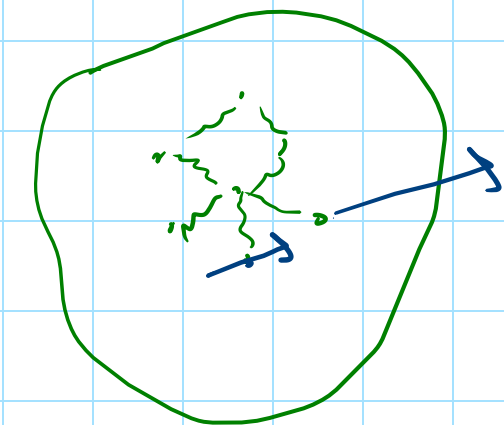
C.R.



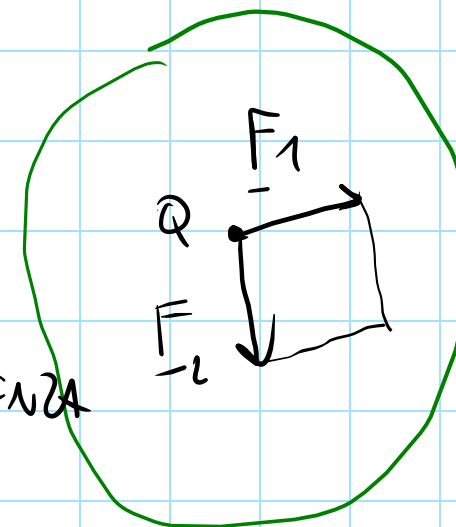
POSTULATO DELLA TRASL. DELLA FORZA LUNGO LA PROPRIA RETTA D'AZIONE:

PER IL C.R. DISEGNATO, IL PROBL. MECCANICO È INVARIANTE SE $\underline{F}$ VIENE APPLICATO AD UN PUNTO QUALSIASI DELLA PROPRIA RETTA D'AZIONE.

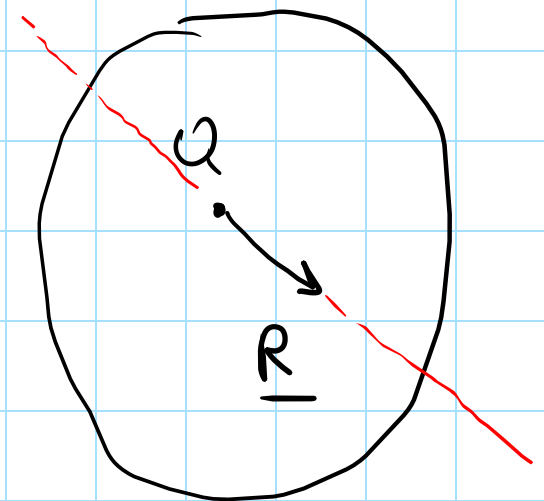
OPERAZIONI LEUTE IN UN C.R.



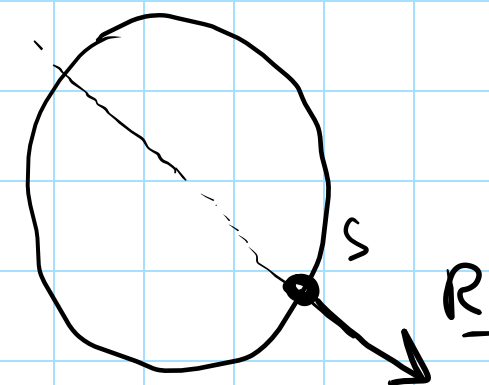
$\underline{F}_1$
 $\equiv$
EQUIVALENZA



$\equiv$

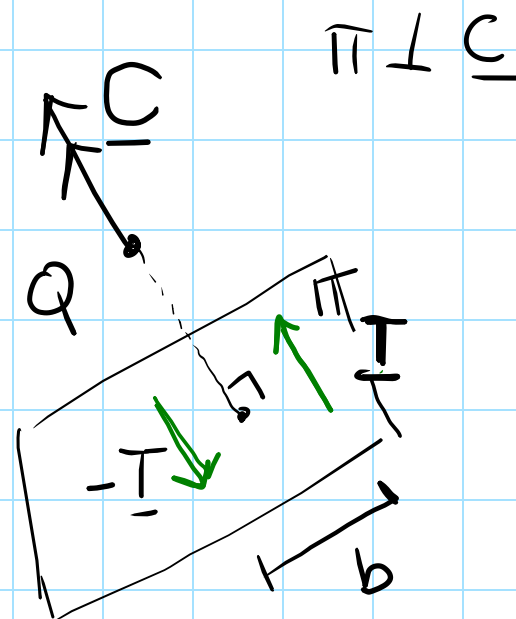


$\equiv$



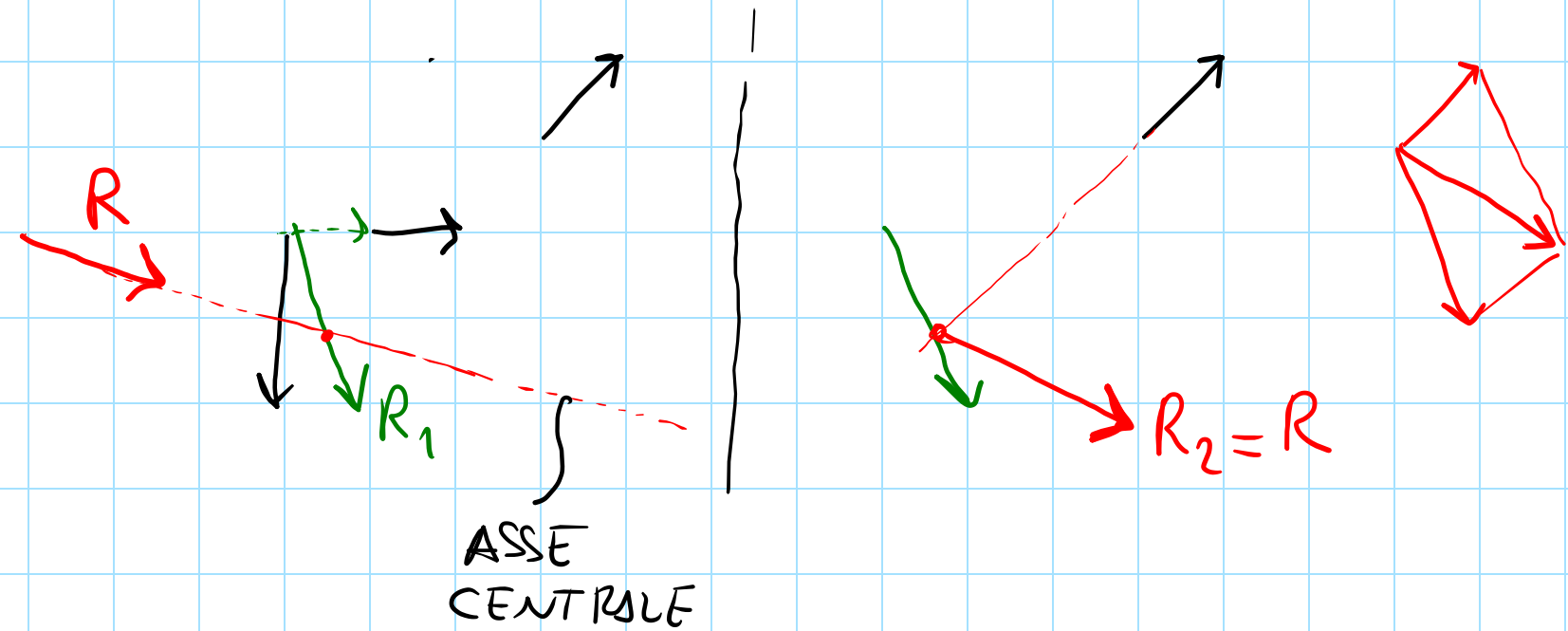
POSTULATO SUI MOMENTI

PER UN C.R. POSSO SOSTITUIRE UN MOMENTO CONCENTRATO CON UNA COPPIA DI FORZE



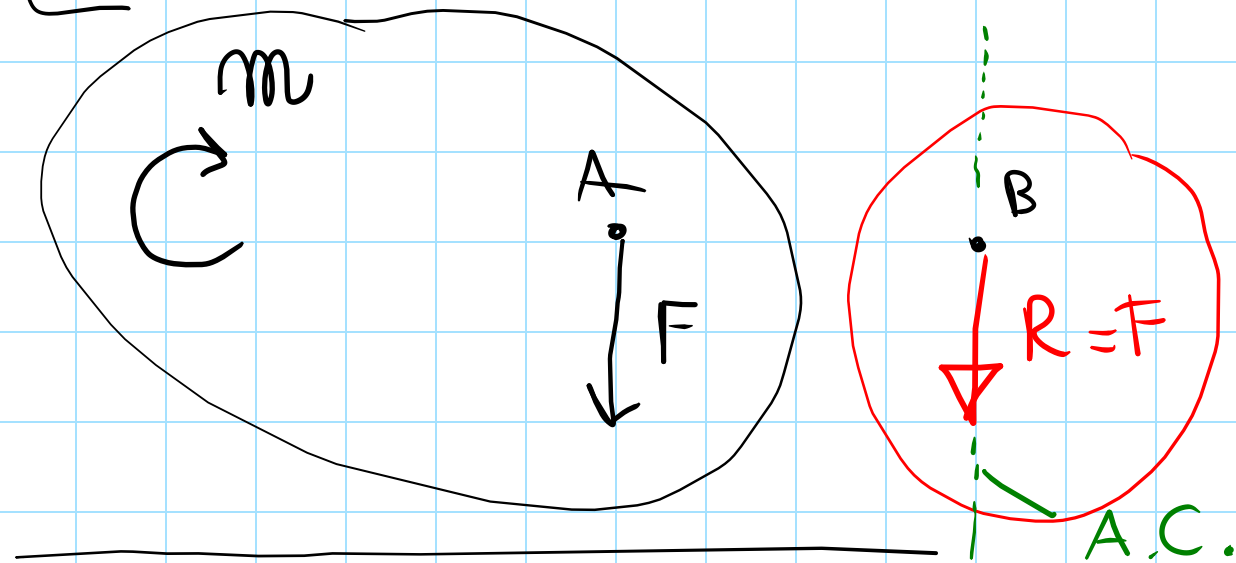
$$|\underline{C}| = |\underline{I}| b$$

QUALCHE ESEMPIO



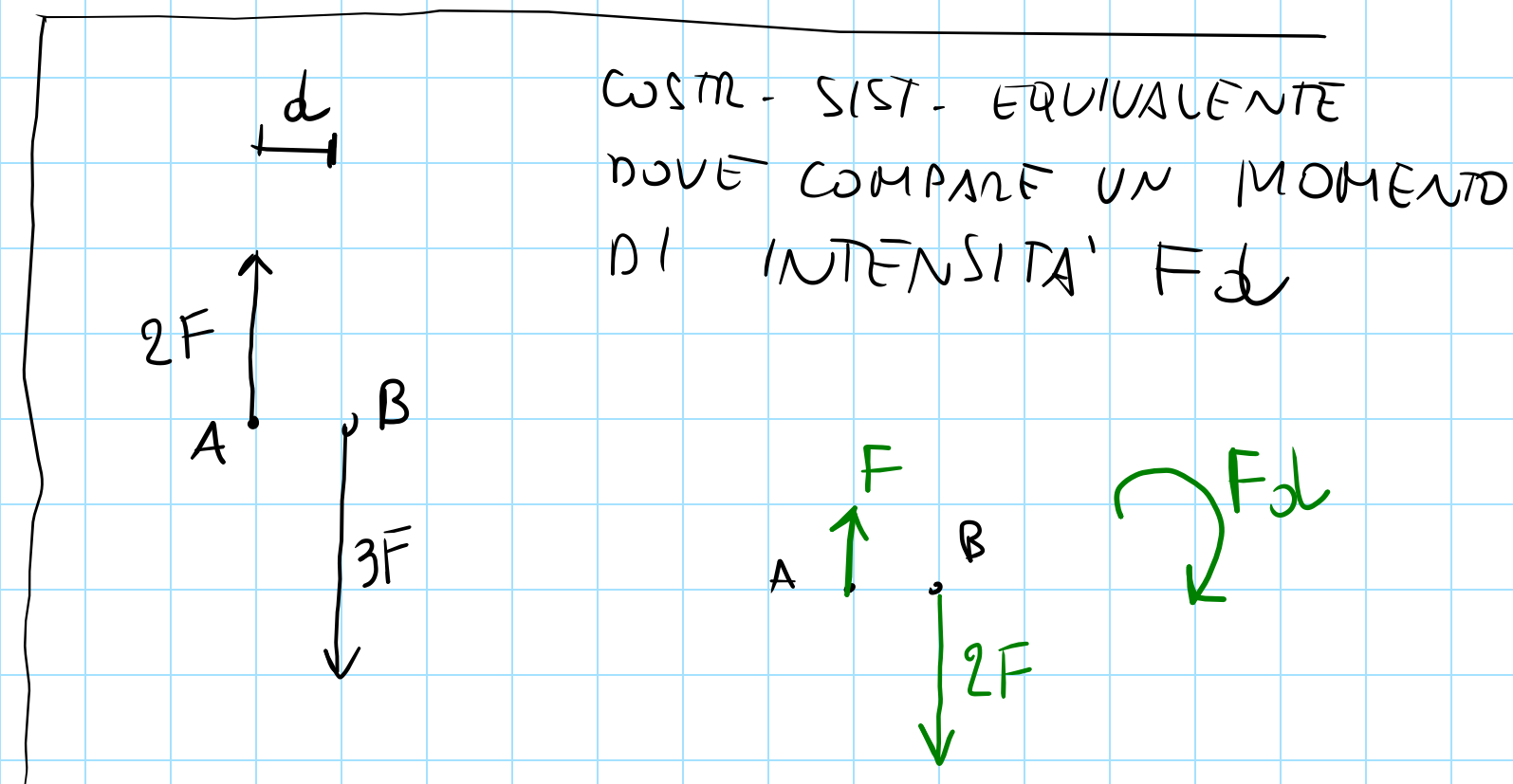
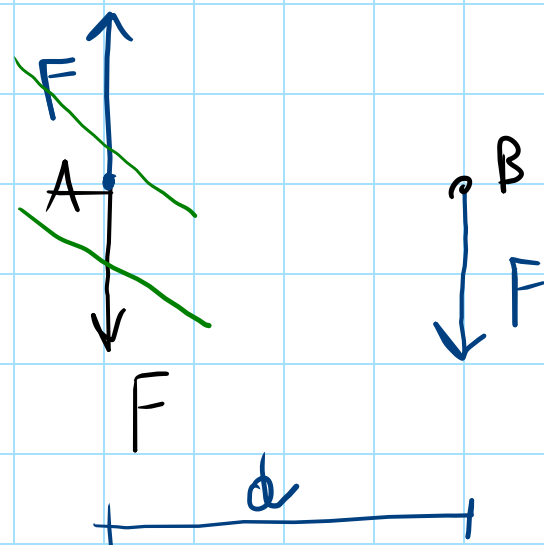
NEI PROBLEMI DI VETTORI PIANI, L'ASSE CENTRALE DI UN SISTEMA DI VETTORI È LA RETTA D'AZIONE DELLA RISULTANTE.

ES DET. UN SIST. COSTITUITO DA UNA SOLA FORZA (R)



$$Fd = m$$

$$d = \frac{m}{F}$$



COSTR. SIST. EQUIVALENTE
DOVE COMPARE UN MOMENTO
DI INTENSITA' Fd

