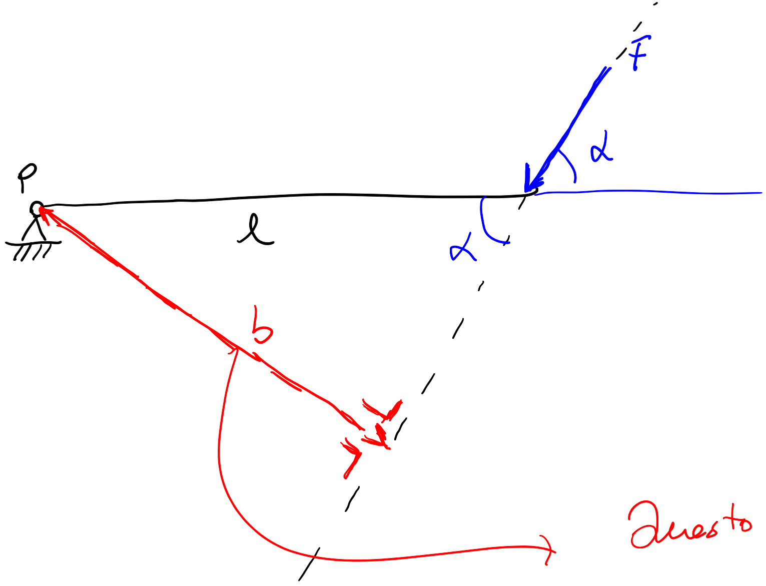


$F = 20\ kN$

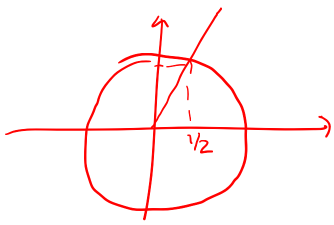
$\alpha = 60°$

$l = 2\ m$

Questo è il braccio!

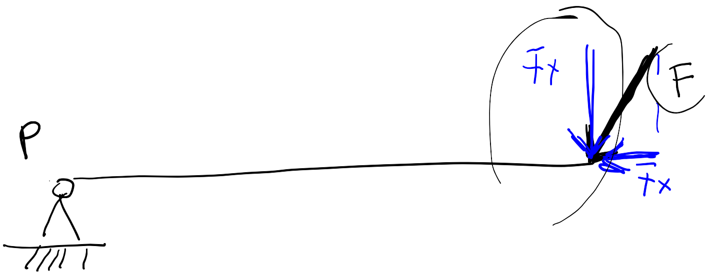
$b = l \operatorname{sen} \alpha = 2\,m \cdot \operatorname{sen} 60° =$

$= 2\,m \cdot \frac{\sqrt{3}}{2} \approx 1.7\ m$



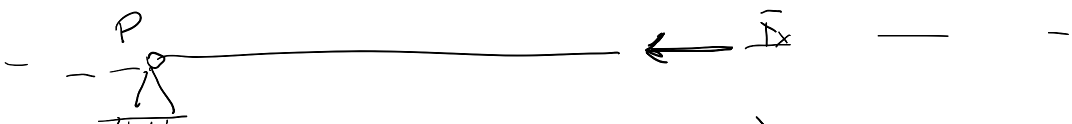
Modulo: $M = F \cdot b = 20\,kN \cdot 1.7\,m =$

$= 34\ kN \cdot m$



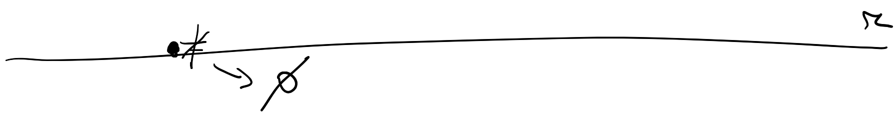
$F_x = F \cos\alpha$

$F_y = F \cdot \operatorname{sen}\alpha$



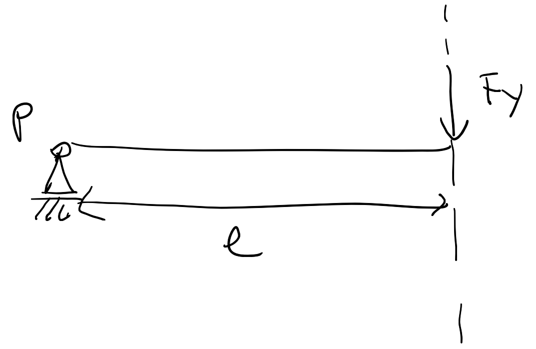
↳ Il braccio è nullo

$\Rightarrow b = 0$



$+\ \circlearrowright P \quad M = F_x \cdot b_x + F_y \cdot b_y$

($F_x \cdot b_x$ → 0)



$M = F_y \cdot l = F \cdot \text{sen}\,\alpha \cdot l =$

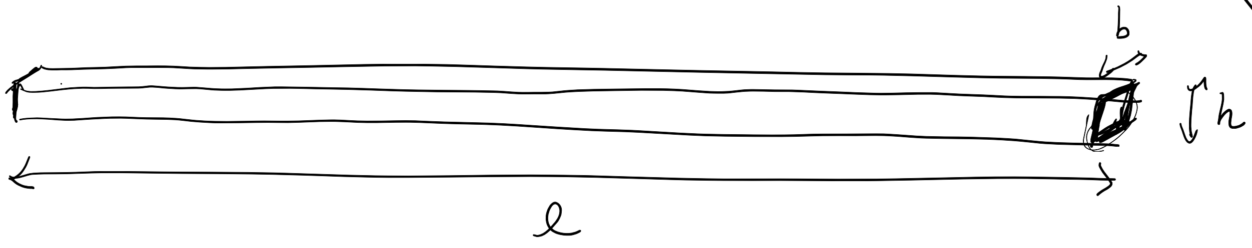
$= 20\ kN \cdot \text{sen}\ 60° \cdot 2\ m =$

$= 34\ kN \cdot m$

ESEMPIO : TRAVE SEMPLICEMENTE APPOGGIATA

↓

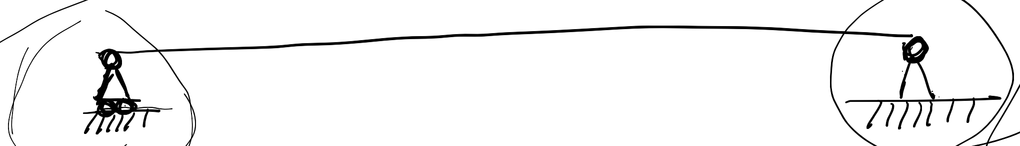
CORPO MONODIMENSIONALE (una dimensione prevale sulle altre 2)



$l \gg b$ e h ⇒ posso considerare il corpo monodimensionale e lo indico con un segmento.

↓

TRAVE SEMPLICEMENTE APPOGGIATA



SISTEMA ISOSTATICO

↓

Cioè il numero di vincoli (con la loro molteplicità) è = ai gradi di libertà.

blocca la traslazione verticale (lungo y) ⇒ blocca 1 g.d.l

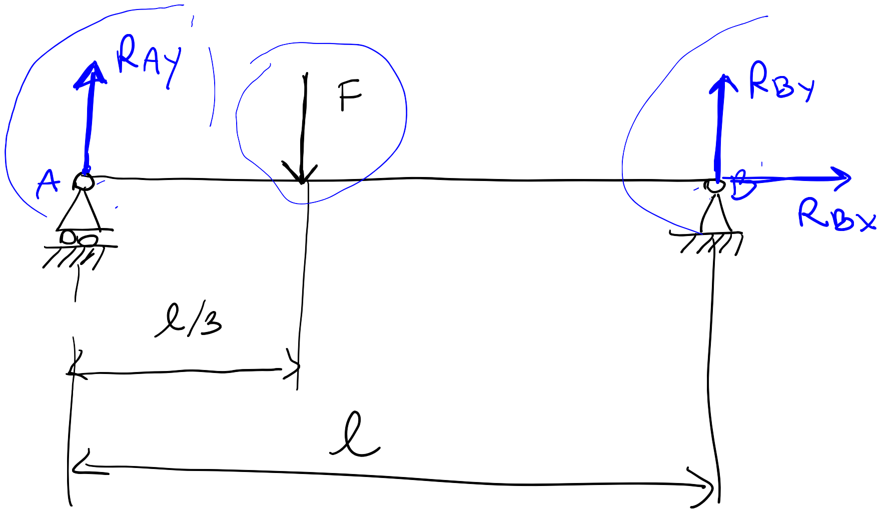
↑ y

blocca le 2 traslazioni

↑ y → x

\+

⇒ blocca 2 g.d.l



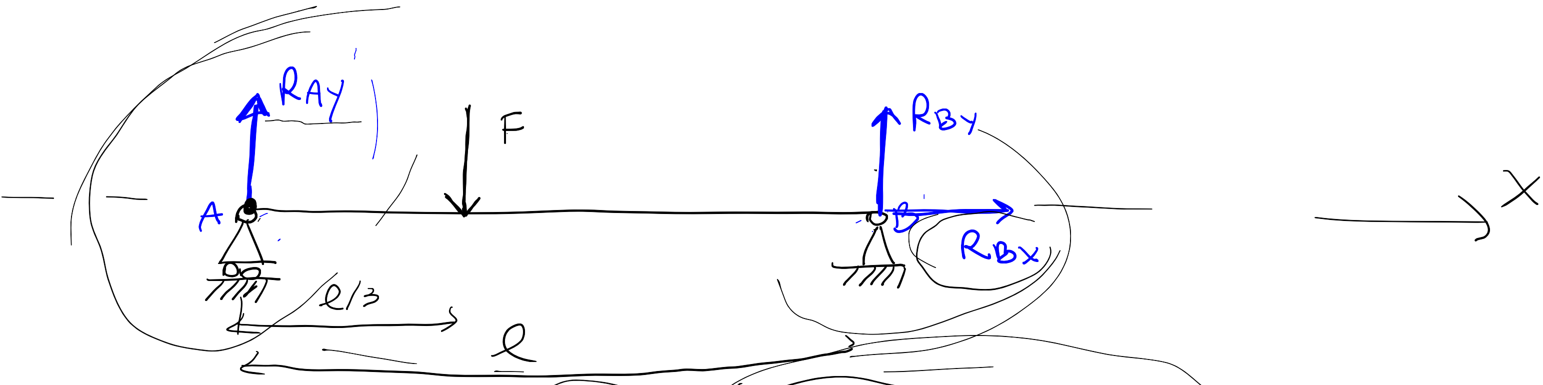
$F = 10$ kN

$\ell = 2$ m

Ob: DETERMINARE LE REAZIONI VINCOLARI R_{Ay}, R_{By} e R_{Bx} che equilibrano il sistema

Come si fa? Si applicano le eqq. cardinali della STATICA:

$$\left.\begin{array}{l} \sum F_x = 0 \\ \sum F_y = 0 \\ \sum M = 0 \end{array}\right\} \Rightarrow \begin{array}{l} R_{Ay} \\ R_{By} \\ R_{Bx} \end{array}$$



$\sum F_x = 0 \rightarrow \overset{+}{\longrightarrow}$ $\quad R_{Bx} = 0$

$\sum F_y = 0 \rightarrow +\uparrow$ $\quad R_{Ay} + R_{By} - F = 0$

$\sum M = 0 \rightarrow \overset{+}{\curvearrowleft}$ (A) $\quad -F \cdot \frac{\ell}{3} + R_{By} \cdot \ell = 0$

$$\begin{cases} R_{Ay} + R_{By} - F = 0 \\ -F\dfrac{l}{3} + R_{By} \cdot l = 0 \end{cases} \Rightarrow \begin{cases} R_{Ay} = F - R_{By} \\ R_{By} l = F\dfrac{l}{3} \end{cases} \Rightarrow$$

$$\Rightarrow \begin{cases} R_{Ay} = F - \dfrac{F}{3} = \dfrac{2}{3}F = \dfrac{2}{3} \cdot 10\ kN = 6.7\ kN \\ R_{By} = F\dfrac{l}{3} \cdot \dfrac{1}{l} = \dfrac{F}{3} = \dfrac{10}{3}\ kN = 3.3\ kN \end{cases}$$