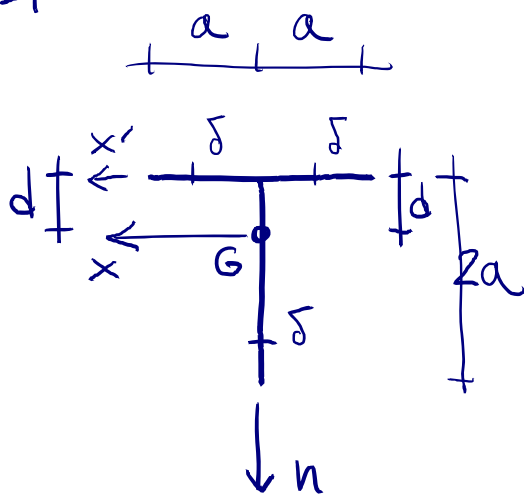
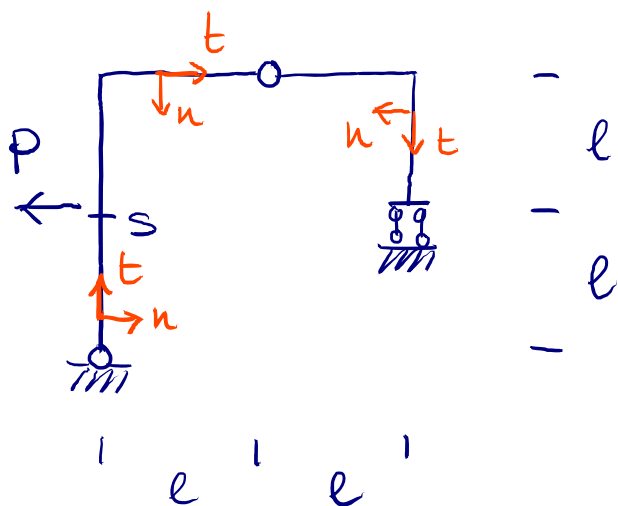


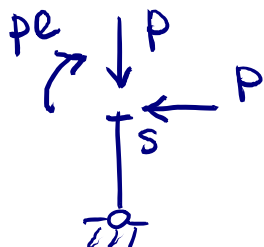


- trovare le c.d.s. in S (sezione che precede P)

$$N = -P$$

$$T = -P$$

$$M = -Pe$$



- trovare la quota del baricentro d

$$A = 4a\delta, \quad S_{x'} = 2a^2\delta \Rightarrow d = \frac{S_{x'}}{A} = \frac{a}{2}$$

- trovare J_x

$$J_x = \frac{\delta(2a)^3}{12} + 2a\delta\left(\frac{a^2}{2}\right) + 2a\delta\left(\frac{a}{2}\right)^2 = \frac{5}{3}a^3\delta$$

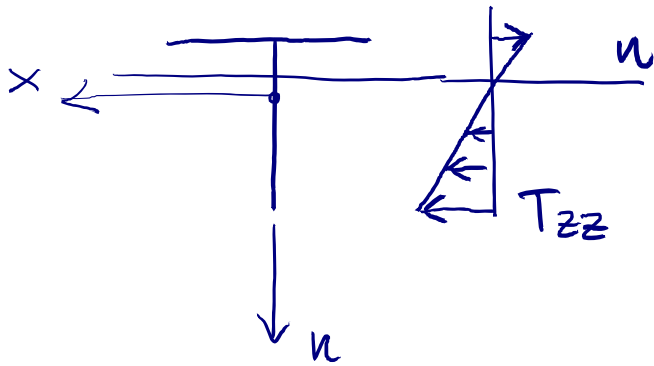
- trovare max T_{zz} e min T_{zz} in S

$$T_{zz} = \frac{N}{A} + \frac{M_x}{J_x} y$$

asse neutro:

$$T_{zz} = 0$$

$$y = -\frac{N}{A} \frac{J_x}{M_x} = -\frac{1}{l} \frac{\frac{5}{3}a^3\delta}{4a\delta} = -\frac{5}{12} \frac{a^2}{l} < 0$$



$$\max T_{zz} = \frac{N}{A} + \frac{M_x}{J_x} \left(-\frac{a}{2} \right)$$

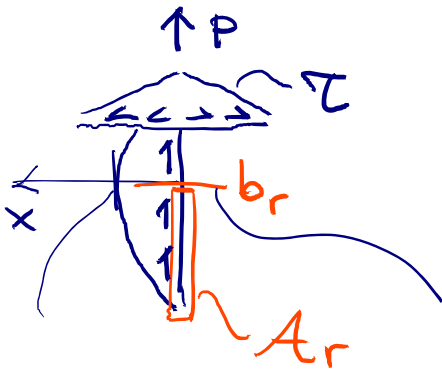
$$\min T_{zz} = \frac{N}{A} + \frac{M_x}{J_x} \left(\frac{3}{2}a \right)$$

$$\min T_{zz} = \frac{-P}{4a\delta} - \frac{Pl}{\frac{5}{3}a^3\delta} \cdot \frac{3}{2}a =$$

$$= -\frac{P}{a\delta} \left(\frac{1}{4} + \frac{9}{10} \frac{l}{a} \right)$$

$$\max T_{zz} = \dots \quad (\text{per caso})$$

- Trovare la tens. tang. massima in S



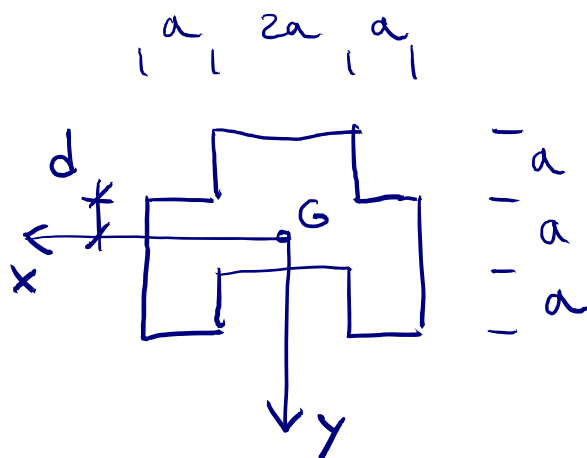
$$b_r = \delta$$

$$(S_x)_r = \delta \cdot \frac{3}{2}a \cdot \frac{\frac{3}{2}a}{2} = \frac{9}{8}a^2\delta$$

su questa
corda si ha
il massimo
momento statico

$$\max \tau = \frac{T_y (S_x)_r}{J_x b_r} = \frac{P \cdot \frac{9}{8}a^2\delta}{\frac{5}{3}a^3\delta \cdot \delta} = \frac{27}{40} \frac{P}{a\delta}$$

Esercizio



- determinare J_x e J_y

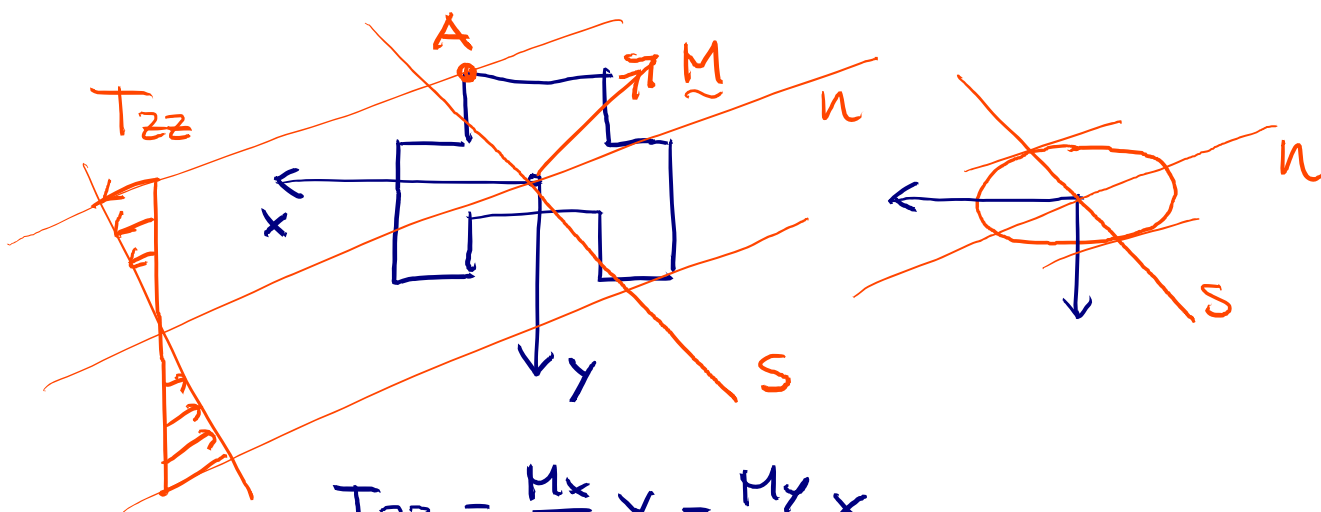
si vede facilmente che $d = \frac{a}{2}$

$$J_x = \frac{14}{3} a^4 \quad J_y = \frac{32}{3} a^4$$

- la sezione è sottoposta al mom. flettente

$$\underline{M} = -M(\underline{e}_x + \underline{e}_y), \quad M > 0,$$

trovare $\max T_{zz}$



$$T_{zz} = \frac{M_x}{J_x} y - \frac{M_y}{J_y} x$$

asse neutro

$$T_{zz} = 0 \Rightarrow y = \frac{M_y}{M_x} \frac{J_x}{J_y} x$$

$y = \frac{7}{16} x < 1 x \Rightarrow$ il punto A è quello dove si ha $\max T_{zz}$

$$\max T_{zz} = -M \left(\frac{y_A}{J_x} - \frac{x_A}{J_y} \right) = \frac{93}{224} \frac{M}{a^3}$$

$$x_A = a, y_A = -\frac{3}{2}a$$

— trovare N affinché la sezione sia tutta compressa

$$\frac{N}{A} \leq -\frac{93}{224} \frac{M}{a^3} \Rightarrow N \leq -\frac{93}{28} \frac{M}{a}$$

$$A = 8a^2$$