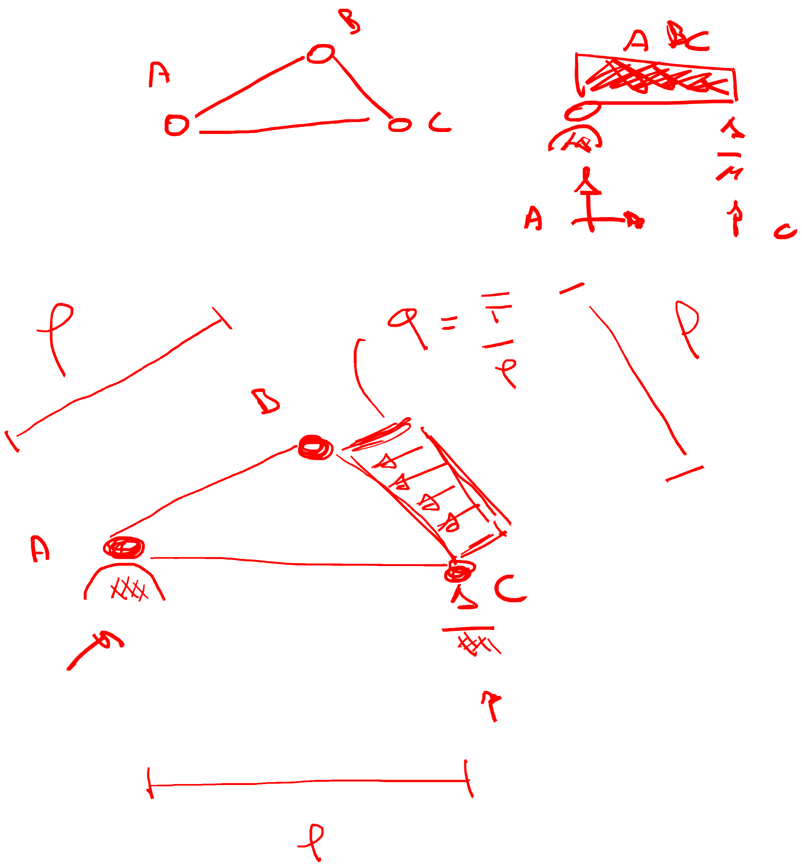
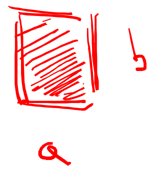
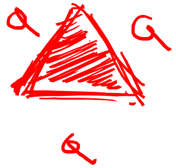
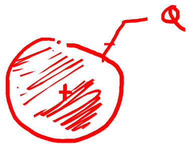


Sezione Resistente

#1 · 

#2 · 

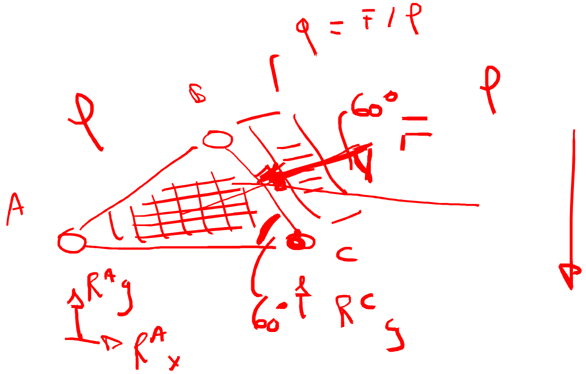
#3 · 

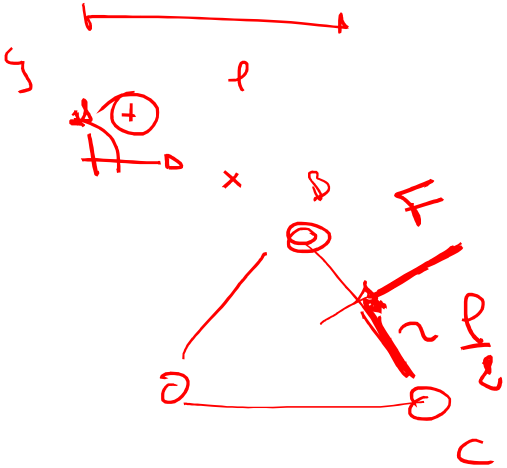
- Equazione Linea elastica → $y(x)$ → $M(x)$
- Energia assorbita dalla struttura → $M(x)$

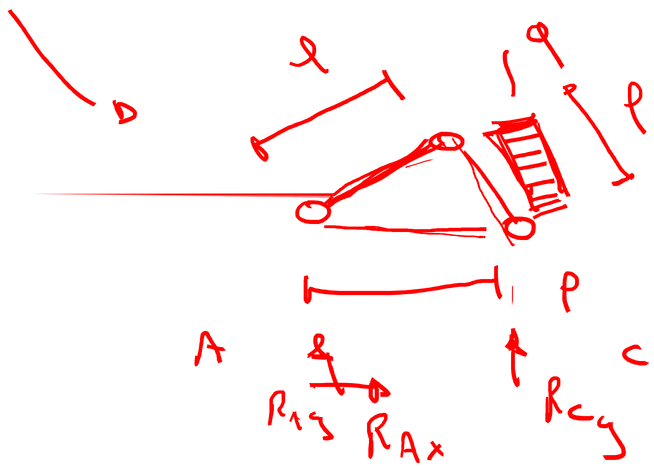
$$x: \quad R^A_x - F \sin 60 = 0$$

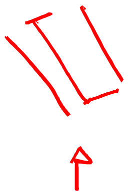
$$y: \quad R^A_y + R^C_y - F \cos 60 = 0$$

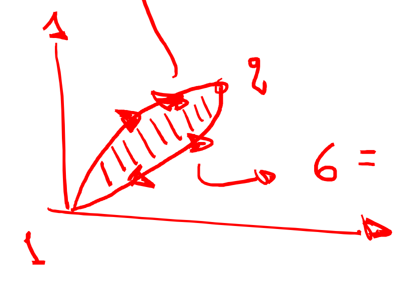
$$\circlearrowleft\big|_C: \quad -R^A_y\, \ell + F\,\frac{\ell}{2} = 0$$











$\sigma = \sigma_0 \varepsilon^{1/2}$

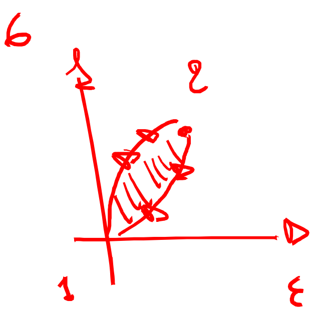
$\sigma = \sigma_0 \varepsilon^{2}$

$\sigma_0 = 20\ MPa$

Toughness → 1 GPa

→ n ?

$$e = \oint \sigma \, d\varepsilon = \int_1^1 \sigma \, d\varepsilon \Rightarrow \underbrace{\int_1^2 \sigma \, d\varepsilon}_{\text{Percorso di carico}} - \underbrace{\int_1^2 \sigma \, d\varepsilon}_{\text{Percorso di scarico}} = \int_1^2 \sigma \, d\varepsilon + \int_2^1 \sigma \, d\varepsilon$$



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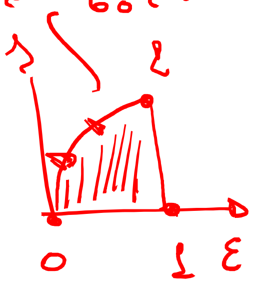

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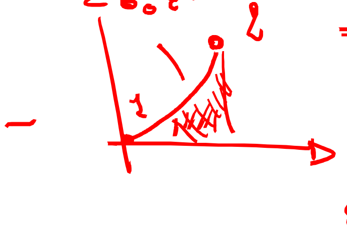
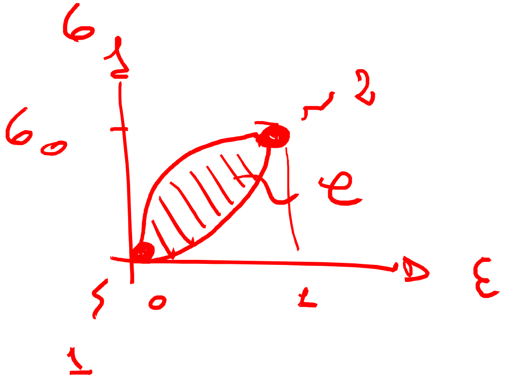


$$\Rightarrow e = \int_1^2 \sigma_0 \varepsilon^{\frac{1}{2}} \, d\varepsilon - \int_1^2 \sigma_0 \varepsilon^{2} \, d\varepsilon$$

$$\Rightarrow e = \int_0^1 \sigma_0 \varepsilon^{1/2} \, d\varepsilon - \int_0^1 \sigma_0 \varepsilon^{2} \, d\varepsilon = \sigma_0 \left[\int_0^1 \varepsilon^{1/2} \, d\varepsilon - \int_0^1 \varepsilon^{2} \, d\varepsilon \right]$$

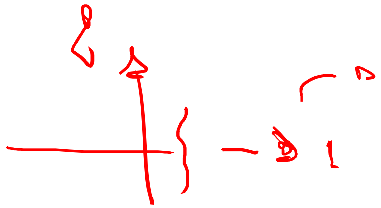


$\rightarrow e \rightarrow \frac{J}{m^3} - \frac{\text{energia}}{\text{volume}}$

$\downarrow$

$$\frac{N \cdot m}{m^2 \cdot m} = [Pa]$$

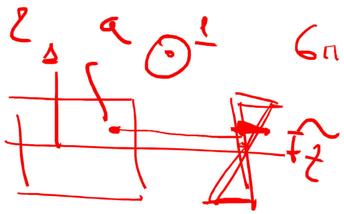
$$n = \frac{\text{Toughness}}{e}$$



σ_{11}

σ_{12}

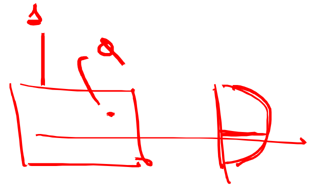
σ^M



$\sigma_{11} \to m_f$

$\frac{m_f}{J} z \to \sigma_{11}(a) \quad \to z_G(a)$

τ



$\sigma_{12} \to T$

$\sigma_{12} = \frac{T S_x}{I b} \to \sigma_{12}(a)$

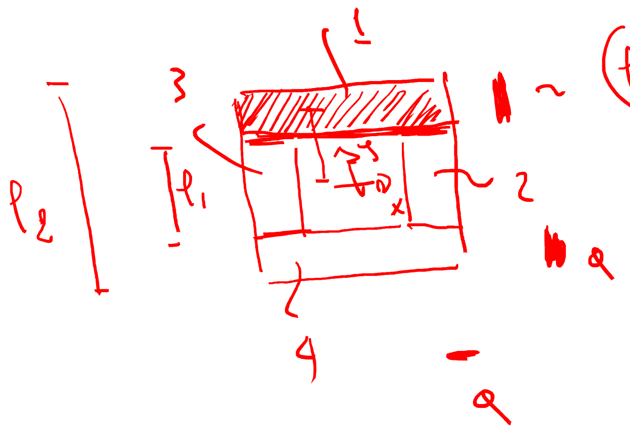
$\underline{\sigma}(a) \to ?$

$$\begin{pmatrix} \sigma_{11}^{a} & \sigma_{12}^{a} \\ \sigma_{12}^{a} & 0 \end{pmatrix}$$

Componenti principali:

$\underline{\sigma}(a) \to \underline{?}$

$$\begin{pmatrix} \sigma_{I} & 0 \\ 0 & \sigma_{II} \end{pmatrix}$$



$\sim (l_2 - l_1)/2 \rightarrow a$

$\bullet\ I_{x_1} = \frac{1}{12} l_2 a^3 + \frac{a l_2}{2^2}(l_1 + a)^2$

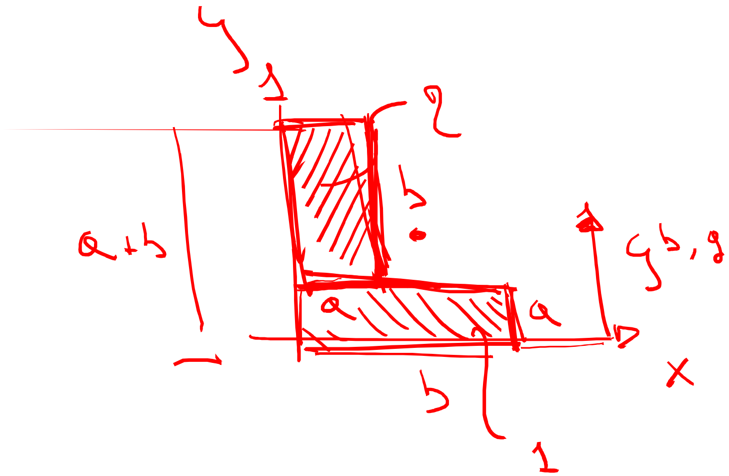
$\bullet\ I_{x_4} = \frac{1}{12} l_2 a^3 + \frac{a l_2}{4}(l_1 + a)^2$

$\bullet\ I_{x_2} = I_{x_3} = \frac{1}{12} a l_1^3$

$\frac{l_1}{2} + \frac{a}{2}$

$I_x^{TOT} = 2 I_{x_1} + 2 I_{x_2} = 2\left(\frac{l_2 a^3}{12} + \frac{a l_2}{4}(l_1 + a)^2 + \frac{a l_1^3}{12}\right)$

$I - I = \frac{1}{12}(l_2^4 - l_1^4)$



x^b

y^b

$$x_g = \frac{S_x}{A} = \frac{S_{x1} + S_{x2}}{A}$$