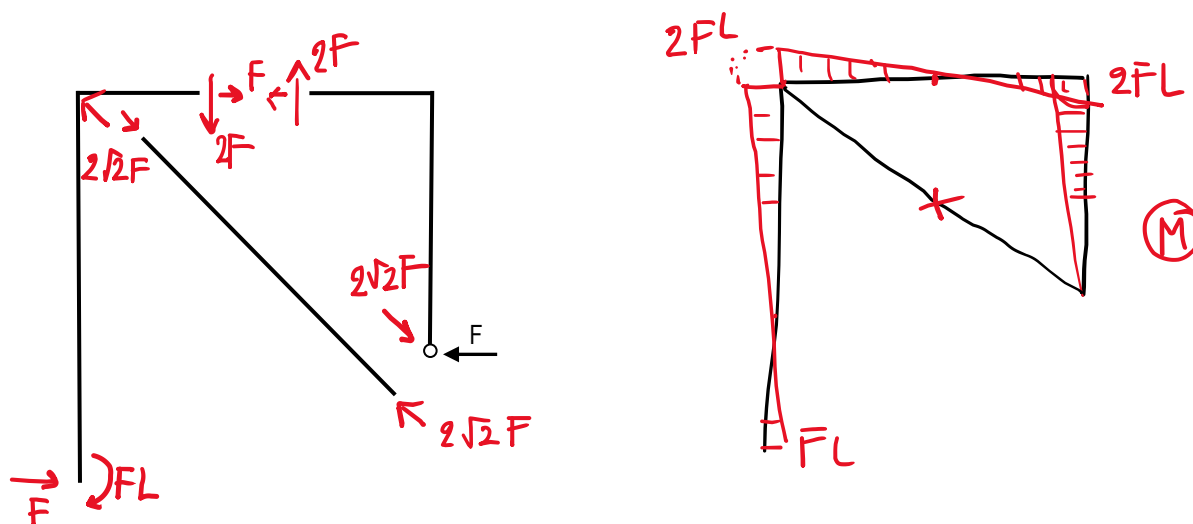
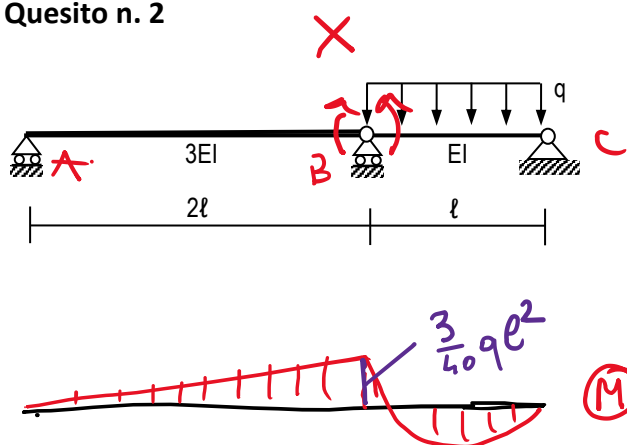


I PARTE

Quesito n. 1



Quesito n. 2



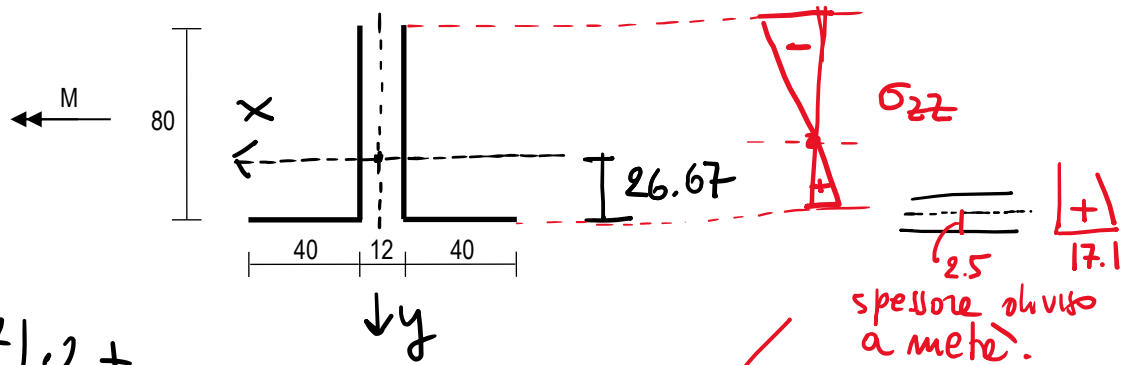
$$\varphi_{BA} = \varphi_{BC} \quad \curvearrowright +$$

$$\frac{X \cdot 2l}{3 \cdot 3EI} = -\frac{Xl}{3EI} + \frac{ql^3}{24EI}$$

$$X = \frac{3}{40} ql^2$$

II PARTE

Quesito n. 1



$$I_x = \left(40 \cdot 5 \cdot 26.67^2 \right) \cdot 2 + 2 \left(\frac{5 \cdot 80^3}{12} + 80 \cdot 5 \cdot 13.33^2 \right) = 853120 \text{ mm}^4$$

$$I_y = \left(80 \cdot 5 \cdot 6^2 \right) \cdot 2 + 2 \left(\frac{5 \cdot 40^3}{12} + 5 \cdot 40 \cdot 26^2 \right) = 366400 \text{ mm}^4$$

$$\sigma_{zz} = \frac{M}{I_x} y = \frac{500'000}{853120} \cdot (26.66 + 2.5) \approx 17.1 \text{ N/mm}^2$$

$$\sigma_{zz} = \frac{M}{I_x} y = \frac{500'000}{853120} \cdot (-53.33) = -31.3 \text{ N/mm}^2$$

spessore alveolo a metà.

Quesito n. 2

$$[\sigma] = \begin{bmatrix} 0 & 0 & 0 \\ 0 & -5 & -2 \\ 0 & -2 & 1 \end{bmatrix} \text{ MPa}; \quad [t_m] = \begin{bmatrix} 0 \\ -5 \\ -2 \end{bmatrix} \text{ MPa}; \quad \tau_m = \frac{t_m - \sigma_{mm} m}{m} = \begin{bmatrix} 0 \\ -5 \\ -2 \end{bmatrix} - \begin{bmatrix} 0 \\ -5 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ -2 \end{bmatrix} \text{ MPa}$$

$$[\sigma^{10}] = -\frac{4}{3} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}; \quad [\sigma^{\text{DEV}}] = \begin{bmatrix} 4/3 & 0 & 0 \\ 0 & -11/3 & -2 \\ 0 & -2 & 7/3 \end{bmatrix} \text{ MPa}$$

tensioni principali:

$$\begin{vmatrix} -1 & 0 & 0 \\ 0 & -5-\lambda & -2 \\ 0 & -2 & 1-\lambda \end{vmatrix} = 0 \Rightarrow \sigma_I = -2 + \sqrt{13}; \quad \sigma_{II} = 0; \quad \sigma_{III} = -2 - \sqrt{13} \text{ (MPa)}$$