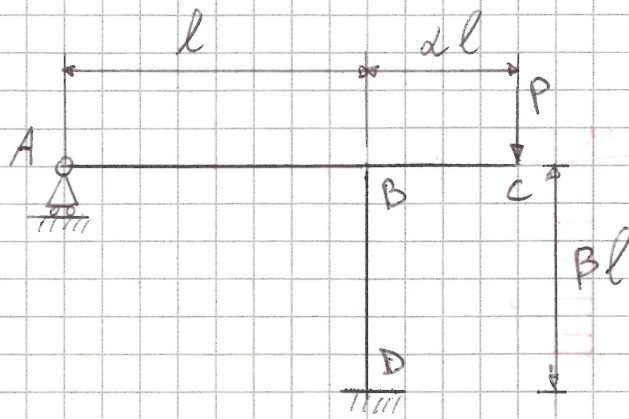
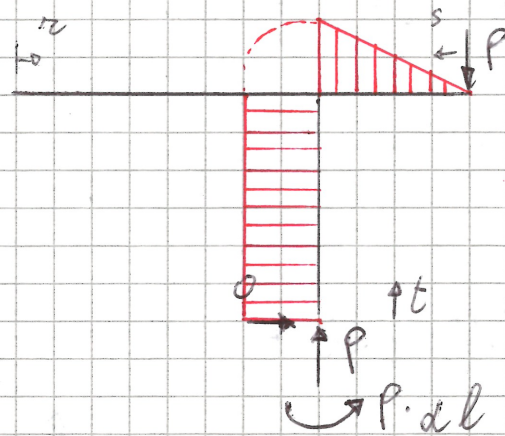


esercizio 2.09.



Parte della struttura principale caricata solo con P

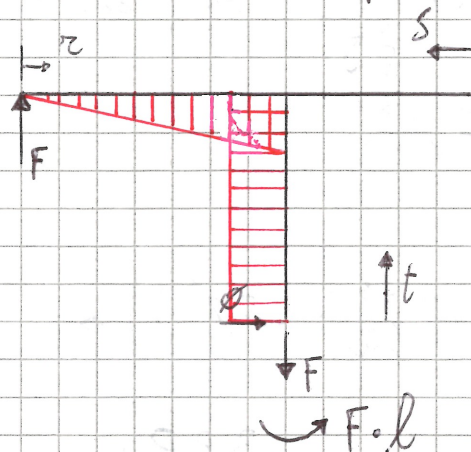


$$M_f(z)_P = 0$$

$$M_f(s)_P = P \cdot s$$

$$M_f(t)_P = P \cdot dl$$

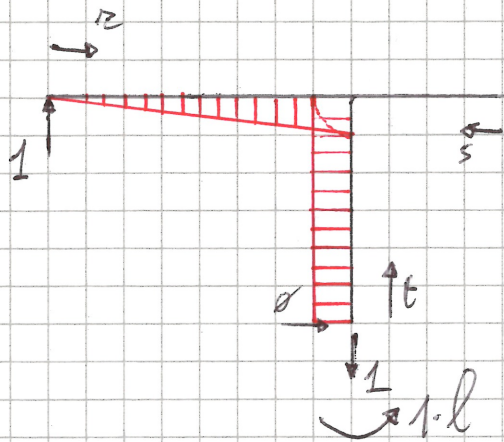
Caricare la struttura principale con F.



$$M_f(z)_F = -F \cdot z ; \quad M_f(s)_F = 0 ; \quad M_f(t)_F = F \cdot l$$



Per trovare  $M_f$  con la forza esplorativa, sfruttando  $M_{fF}$ :



$$M_f(z)_1 = -1 \cdot z; \quad M_f(s)_1 = 0; \quad M_f(t)_1 = 1 \cdot l$$

Applico il PLV.

$$h_e = 1 \cdot 0 = 0$$

$$h_i = \int_0^l (M_{fP}(z) + M_{fF}(z)) \cdot \frac{1}{EJ} \cdot M_f(z)_1 dz +$$

$$+ \int_0^{\beta l} (M_{fP}(s) + M_{fF}(s)) \cdot \frac{1}{EJ} \cdot M_f(s)_1 ds +$$

$$+ \int_0^{\beta l} (M_{fP}(t) + M_{fF}(t)) \cdot \frac{1}{EJ} \cdot M_f(t)_1 dt =$$

$$= \int_0^l \frac{-F \cdot z \cdot (l-z)}{EJ} dz + \int_0^{\beta l} \frac{(P \cdot l + F \cdot l) \cdot (l)}{EJ} dt =$$

$$= \frac{1}{EJ} \cdot \left( \frac{Fl^3}{3} + P \cdot l^3 \cdot \beta + F \cdot l^3 \cdot \beta \right)$$

$$h_e = h_i \Rightarrow 0 = \frac{1}{EJ} \left( \frac{Fl^3}{3} + P \cdot l^3 \cdot \beta + F \cdot l^3 \cdot \beta \right) \Rightarrow$$

$$\Rightarrow F + 3\beta P + 3F \cdot \beta = 0 \Rightarrow F = \frac{-3\beta \cdot \alpha \cdot P}{1 + 3\beta}$$