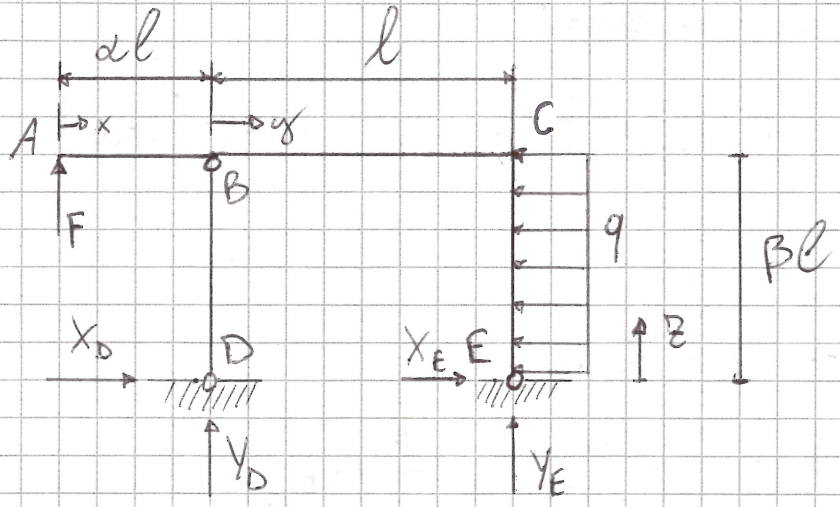
Esercizio 1.18



Considero solo il carico distribuito q.

Equilibrio dell'intera struttura:

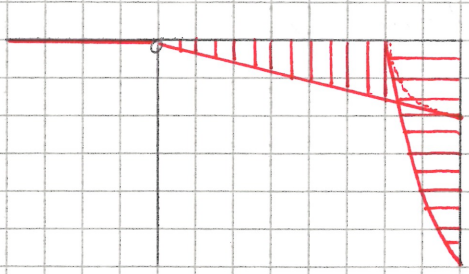
$$\uparrow] \; Y_{D_q} + Y_{E_q} = 0 \longrightarrow Y_{D_q} = q \cdot \frac{\beta^2 l}{2}$$

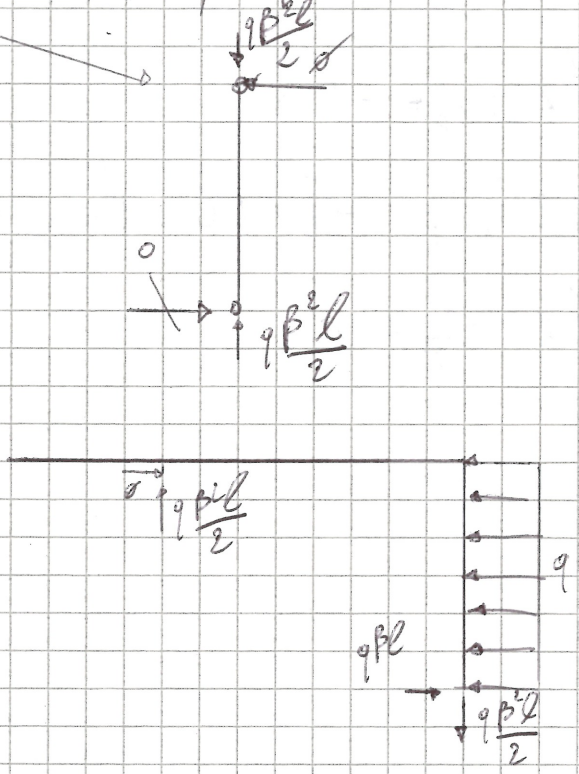
$$\rightarrow] \; X_{D_q} + X_{E_q} - q \cdot \beta l = 0$$

$$+\circlearrowright] \; Y_{E_q} \cdot l = -q \cdot \beta l \cdot \beta \frac{l}{2} \rightarrow Y_{E_q} = -q \cdot \frac{\beta^2 l}{2}$$

Noto che $\overline{DB}$ è una biella: $X_{D_q} = 0 \rightarrow X_{E_q} = q \cdot \beta l$

Traccio il diagramma di Mf:





$$Mf_{AB}(x)_q = 0$$

$$Mf_{BC}(y)_q = -q\beta^2 l \cdot y$$

$$Mf_{EC}(z)_q = q \cdot \frac{z^2}{2} - q\beta l \cdot z$$

Considero il carico concentrato F.

Equilibrio dell'intera struttura:

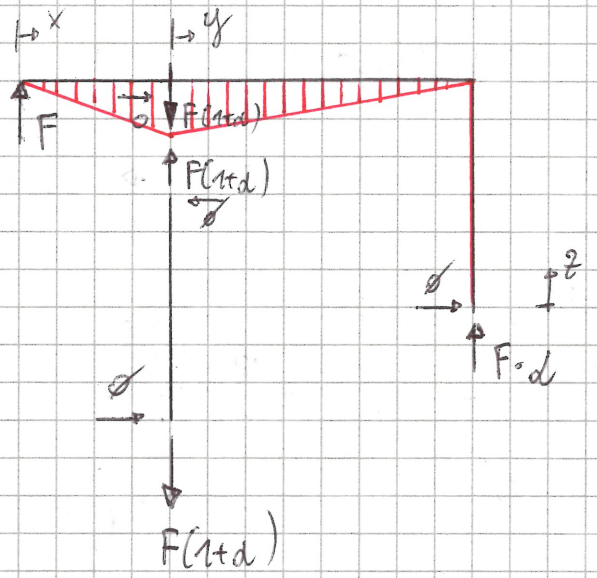
$\uparrow^{+}$ $F + Y_{D_F} + Y_{E_F} = 0 \rightarrow Y_{D_F} = F(-1-\alpha) = -F(1+\alpha)$

$\rightarrow^{+}$ $X_{D_F} + X_{E_F} = 0$

$\circlearrowright^{+}$ $Y_{E_F} \cdot l = F \cdot \alpha l \rightarrow Y_{E_F} = F \cdot \alpha$

$\rightarrow$ DB è una biella $\rightarrow X_{D_F} = 0 \rightarrow X_{E_F} = 0$

Traccio M_{f_F}:



$M_{f(x)_F} = -F \cdot x$

$M_{f(y)_F} = -F \cdot \alpha l - F \cdot y + F(1+\alpha) \cdot y$

$M_{f(z)_F} = \emptyset$