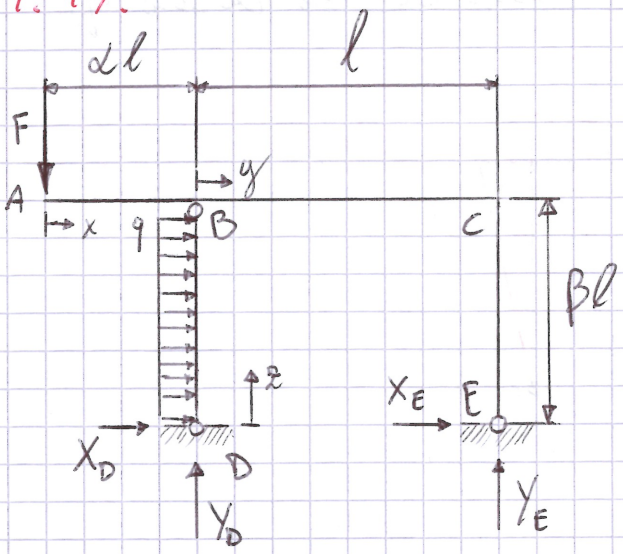
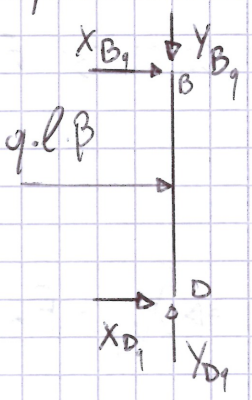
Esercizio 1.17.



Calcolo le reazioni vincolari dovute al solo carico q.
(N.B. in questo caso, la trave BD non è una biella).

Analizzo prima la trave BD.



$$\rightarrow^{+}] \quad q\cdot l\beta + X_{D_q} + X_{B_q} = 0 \longrightarrow X_{D_q} = -\frac{q l\beta}{2}$$

$$+\circlearrowleft_{D}] \quad X_{B_q}\cdot \beta l + q l\beta \cdot \frac{\beta l}{2} = 0 \rightarrow X_{B_q} = -\frac{q l\beta}{2}$$

$$\uparrow^{+}] \quad Y_{D_q} = Y_{B_q}$$

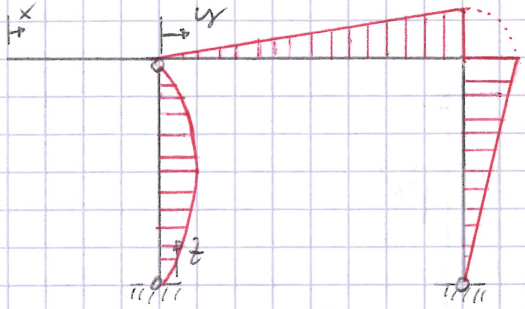
Conviene ora considerare la struttura nel suo insieme.

$$\rightarrow^{+}] \quad X_{D_q} + X_{E_q} + q\cdot \beta l = 0 \rightarrow X_{E_q} = -q\cdot\beta l + \frac{q l\beta}{2} = -\frac{q l\beta}{2}$$

$$+\circlearrowleft_{D}] \quad Y_{E_q}\cdot l = q\cdot \beta l \cdot \frac{\beta l}{2} \rightarrow Y_{E_q} = q\cdot l\cdot \frac{\beta^2}{2}$$

$$+\circlearrowleft] \quad Y_{D_q} + Y_{E_q} = 0 \rightarrow Y_{D_q}(=Y_{B_q}) = -q l\cdot \frac{\beta^2}{2}$$

Calcolo i momenti flettenti dovuti al solo carico q.



$$M_{f_q}(x) = 0;$$

$$M_{f_q}(y) = -q\ell\frac{\beta^2}{2}\cdot y$$

$$M_{f_q}(z) = q\ell\frac{\beta}{2}\cdot z - q\frac{z^2}{2}$$

Calcolo le reazioni vincolari dovute al solo carico F.
(N.B. Ora la trave BD è una biellette)
Considero la struttura nella sua interezza.

$$\uparrow] \quad Y_{D_F} + Y_{E_F} = F$$

$$\rightarrow] \quad X_{D_F} + X_{E_F} = 0$$

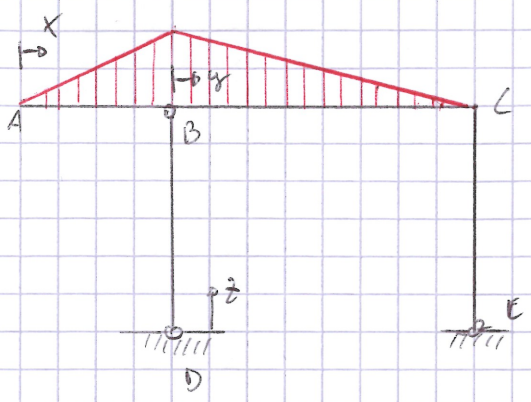
$$\rightarrow \text{ BD è una biellette} \Rightarrow X_{D_F} = 0$$

$$\Big\} \Rightarrow X_{E_F} = 0$$

$$\circlearrowleft_D] \quad F\cdot\alpha\ell + Y_{E_F}\cdot\ell = 0 \rightarrow Y_{E_F} = -\alpha\cdot F$$

$$\Big\} \Rightarrow Y_{D_F} = F + \alpha F$$

Calcolo i momenti flettenti dovuti al solo caricamento F.



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

$$M_{f_F}(y) = -F \cdot \alpha l + (F + \alpha F - F) * y$$

$$M_{f_F}(z) = 0$$