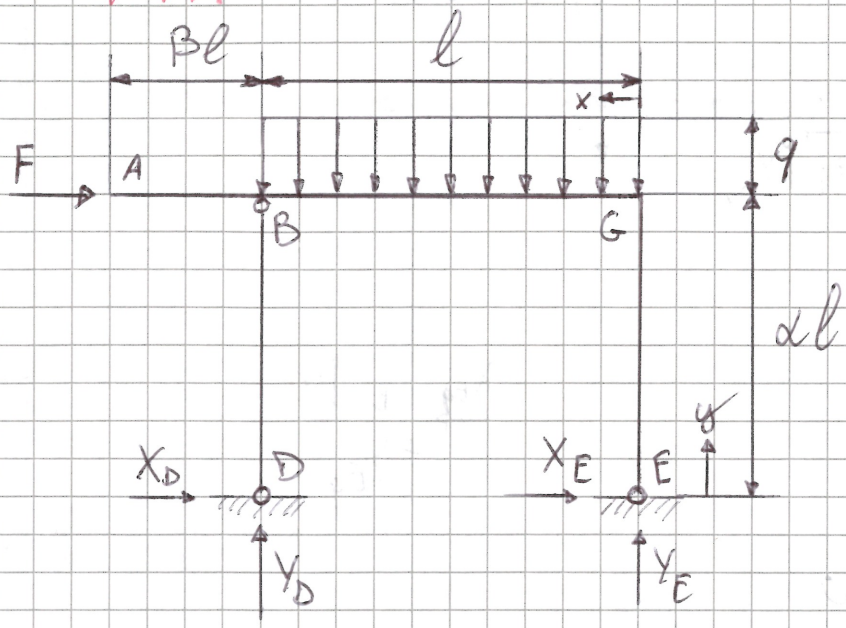
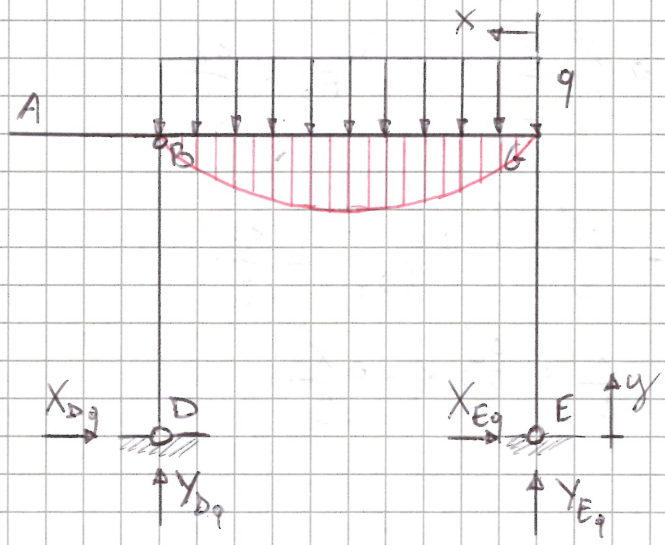
Esercizio 1.14.



Calcolo le reazioni vincolari dovute al solo carico q.



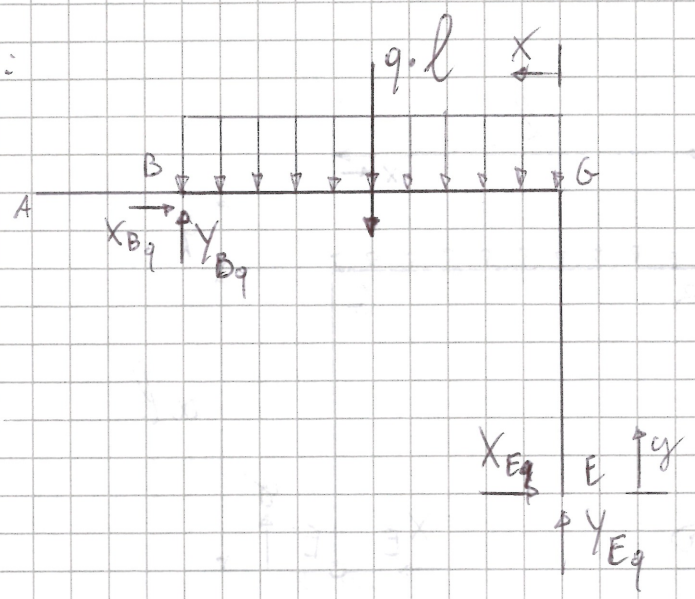
Divido la struttura nelle travi DB e EGA.

DB è una bielletta $\Rightarrow$ $X_{Dq} = 0$

$\Rightarrow X_{Bq} = X_{Dq} = 0$

$Y_{Bq} = Y_{Dq}$

Trave EGA:



$\rightarrow] \quad X_{Eq} = -X_{Bq} = 0$

$\uparrow] \quad Y_{Bq} + Y_{Eq} = 0 \rightarrow Y_{Bq} = \frac{ql}{2}$

$B) \quad X_{Eq} \cdot dl + Y_{Eq} \cdot l = q \cdot l \cdot \frac{l}{2} \rightarrow Y_{Eq} = \frac{ql}{2}$

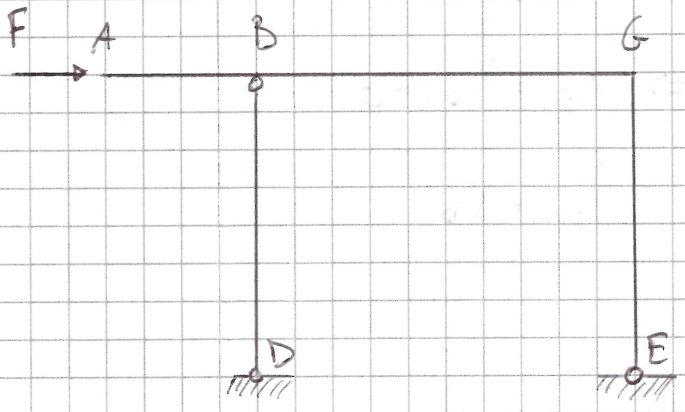
($X_{Eq} \cdot dl = 0$)

$N_{ABq} = 0 \; ; \; N_{BDq} = -\frac{ql}{2} \; ; \; N_{EGq} = -\frac{ql}{2}$

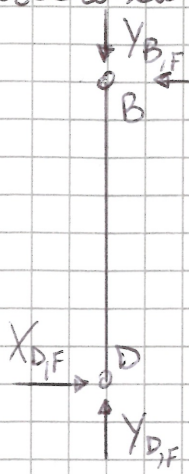
$M_{f,GB,q}(x) = Y_{Eq} \cdot X - q \cdot x \cdot \frac{x}{2} = \frac{ql}{2} \cdot x - q\frac{x^2}{2}$

$M_{f,EGq}(q) = 0$

Calcolo la struttura al solo carico F.



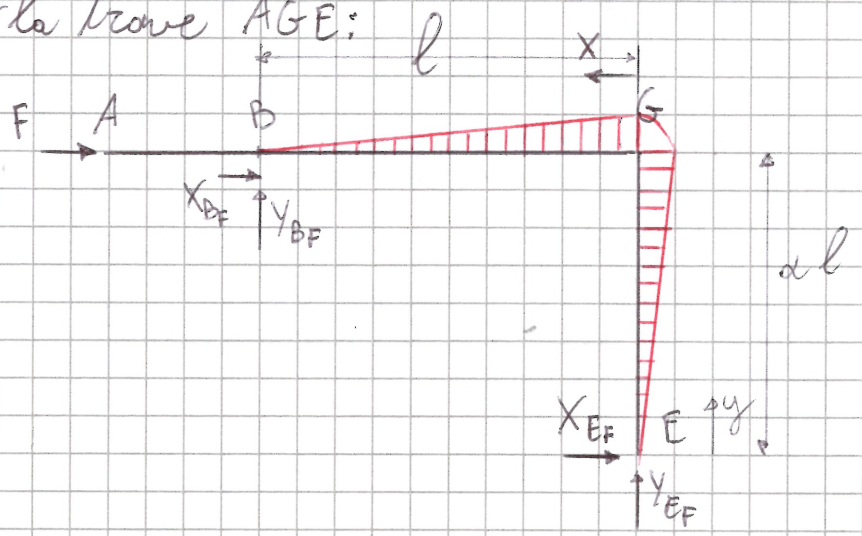
Considero la trave DB: è una biellette.



$X_{B,F}$ è una biellette $\rightarrow X_{B,F} = X_{D,F} = 0$

$Y_{D,F} = Y_{B,F}$

Considero la trave AGE:



$\rightarrow$] $F + X_{DF} + X_{EF} = 0 \rightarrow X_{E,F} = -F$

$\uparrow$] $Y_{B,F} + Y_{E,F} = 0 \rightarrow Y_{B,F} = -\alpha \cdot F$

Ⓑ] $X_{E,F} \cdot \alpha\ell + Y_{E,F} \cdot \ell = 0 \rightarrow Y_{E,F} = \alpha \cdot F$

$N_{AB,F} = -F$; $N_{BD} = +\alpha \cdot F$; $N_{EG} = -\alpha F$

$M_{f,G-B_F}(x) = +Y_{EF} \cdot x + X_{EF} \cdot \alpha\ell = \alpha F \cdot x - F \cdot \alpha\ell$

$M_{f,EG_F}(y) = X_{EF} \cdot y = -F \cdot y$