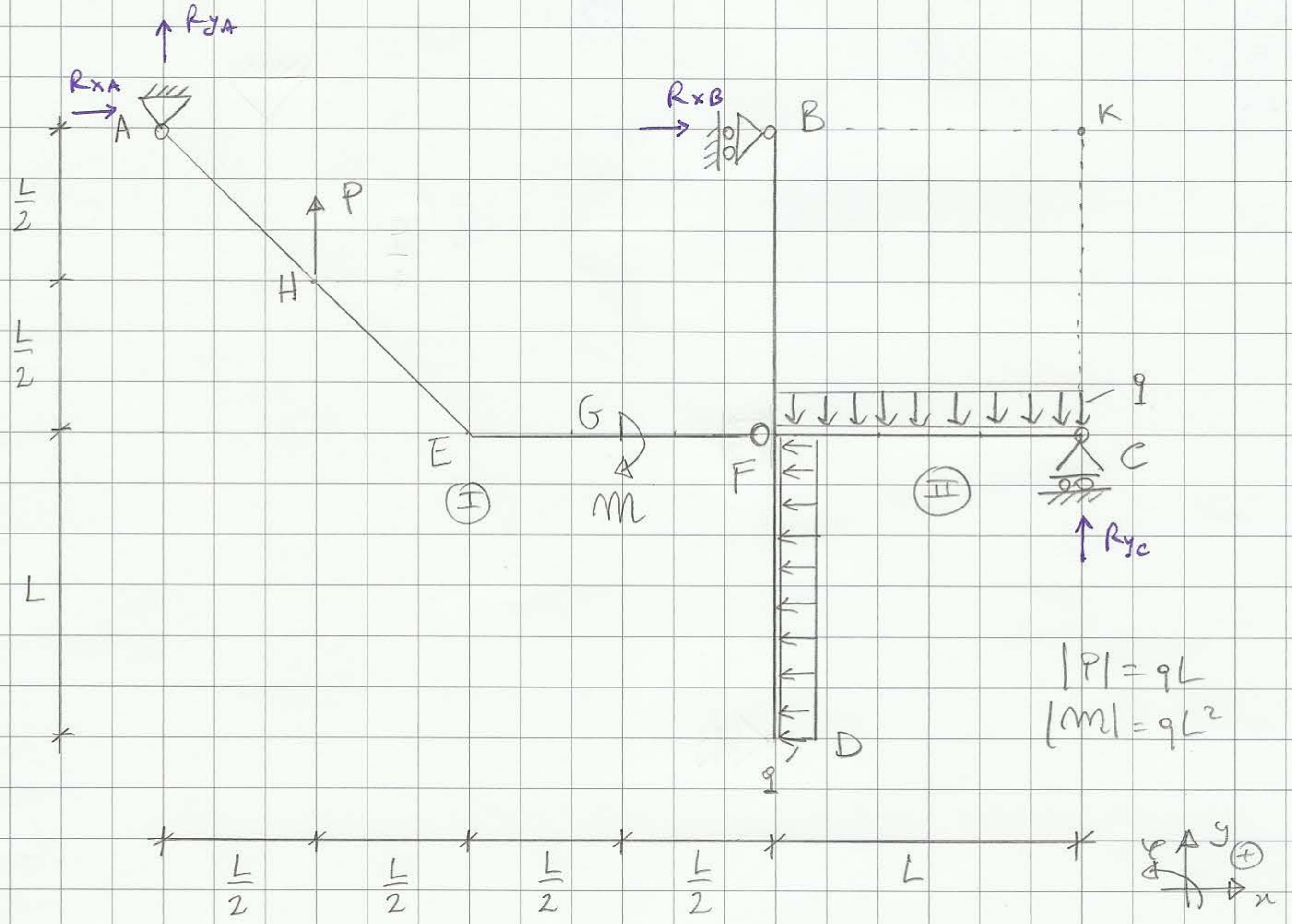


c.N] $l = 3N - m_t = 3 \cdot 2 - 6 = 0$

c.s] $C_I \equiv A$; $C_{I\,II} \equiv F$; $C_{II} \equiv K$ — sistema isostatico

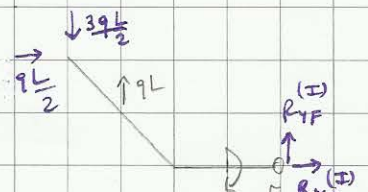
i centri non sono allineati!

$$
\begin{cases}
1)\ \sum F_x = 0 \rightarrow R_{xA} - qL + R_{xB} = 0 \rightarrow \boxed{R_{xA} = qL - q\frac{L}{2} = q\frac{L}{2}} \\
2)\ \sum F_y = 0 \rightarrow R_{yA} + R_{yC} - qL + P = 0 \rightarrow \boxed{R_{yC} = \frac{3qL}{2}} \\
3)\ \sum M_K = 0 \rightarrow -R_{yA} \cdot (3L) - P\left(\frac{5}{2}L\right) - M - qL\left(\frac{3}{2}L\right) + qL\left(\frac{L}{2}\right) = 0 \rightarrow \boxed{R_{yA} = -\frac{3}{2}qL}
\end{cases}
$$

$$4)\ \sum M_F^{(II)} = 0 \rightarrow -qL\left(\frac{L}{2}\right) - qL\left(\frac{L}{2}\right) - R_{xB} \cdot (L) + R_{yC} \cdot (L) = 0$$

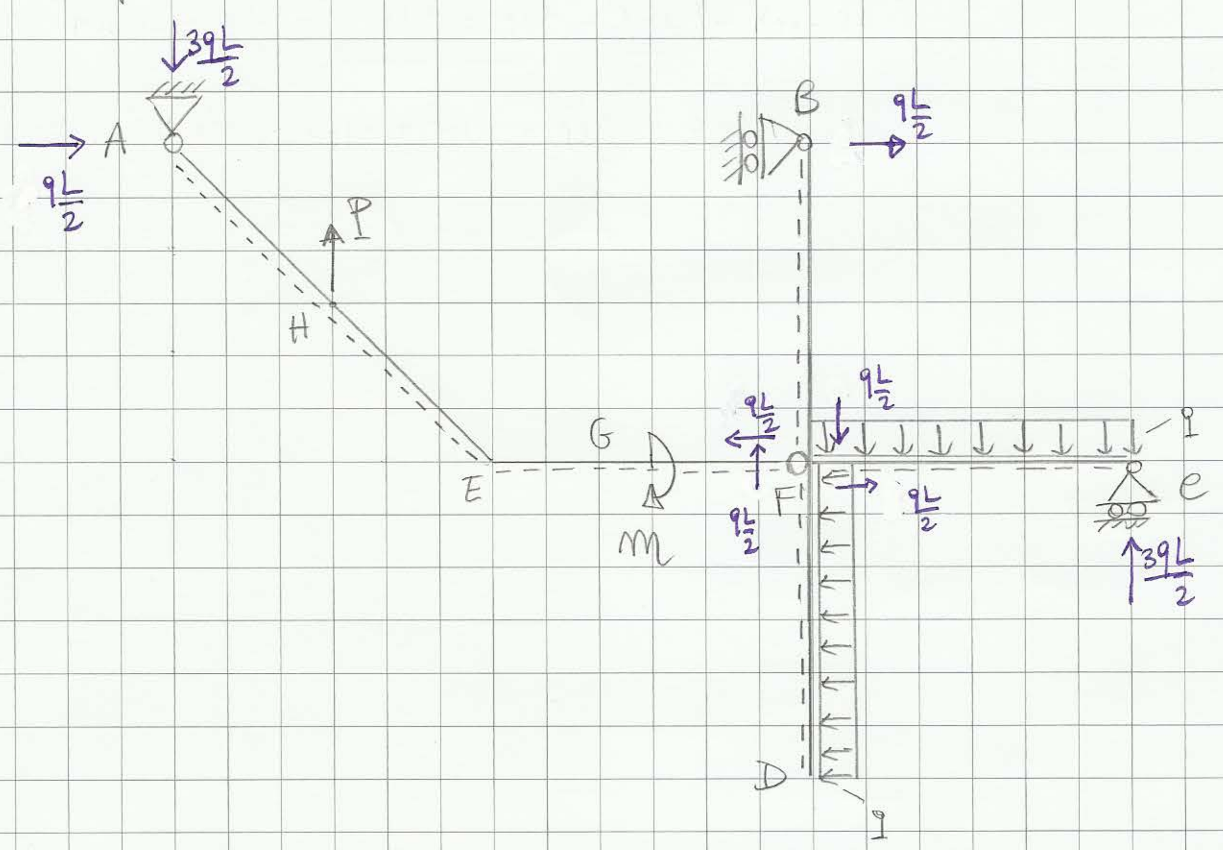
$$\boxed{R_{xB} = \frac{3qL}{2} - qL = \frac{qL}{2}}$$

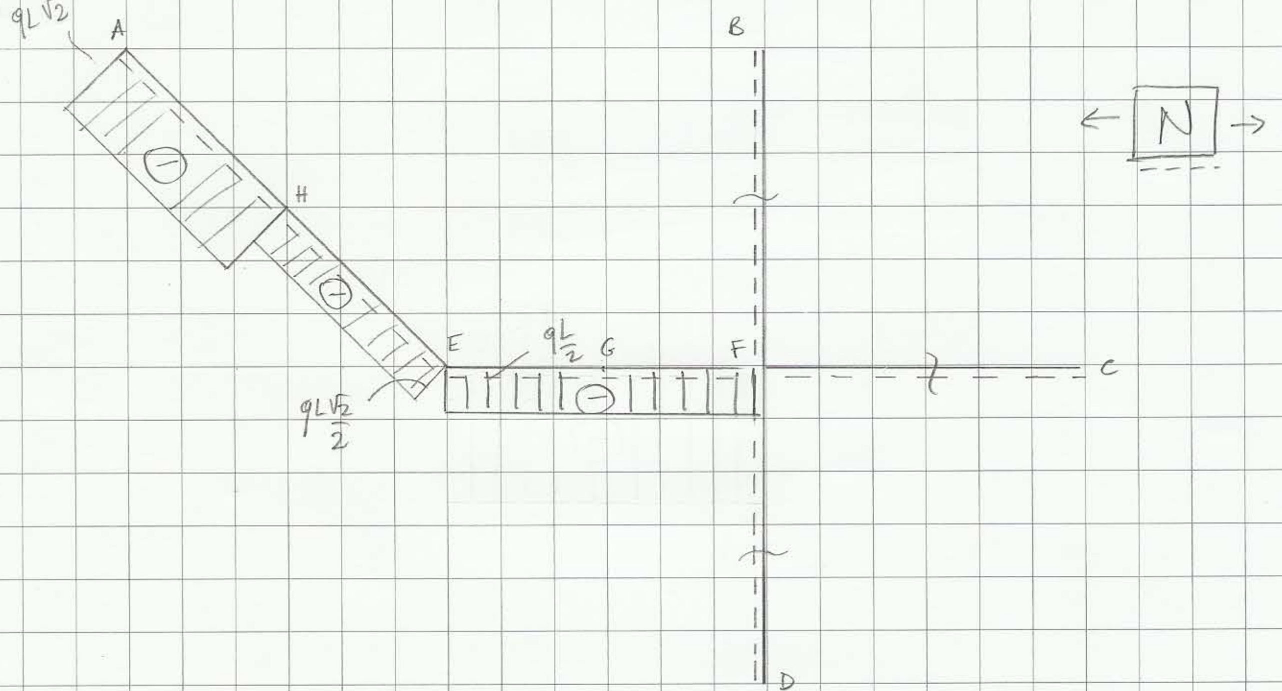
R.V. interne

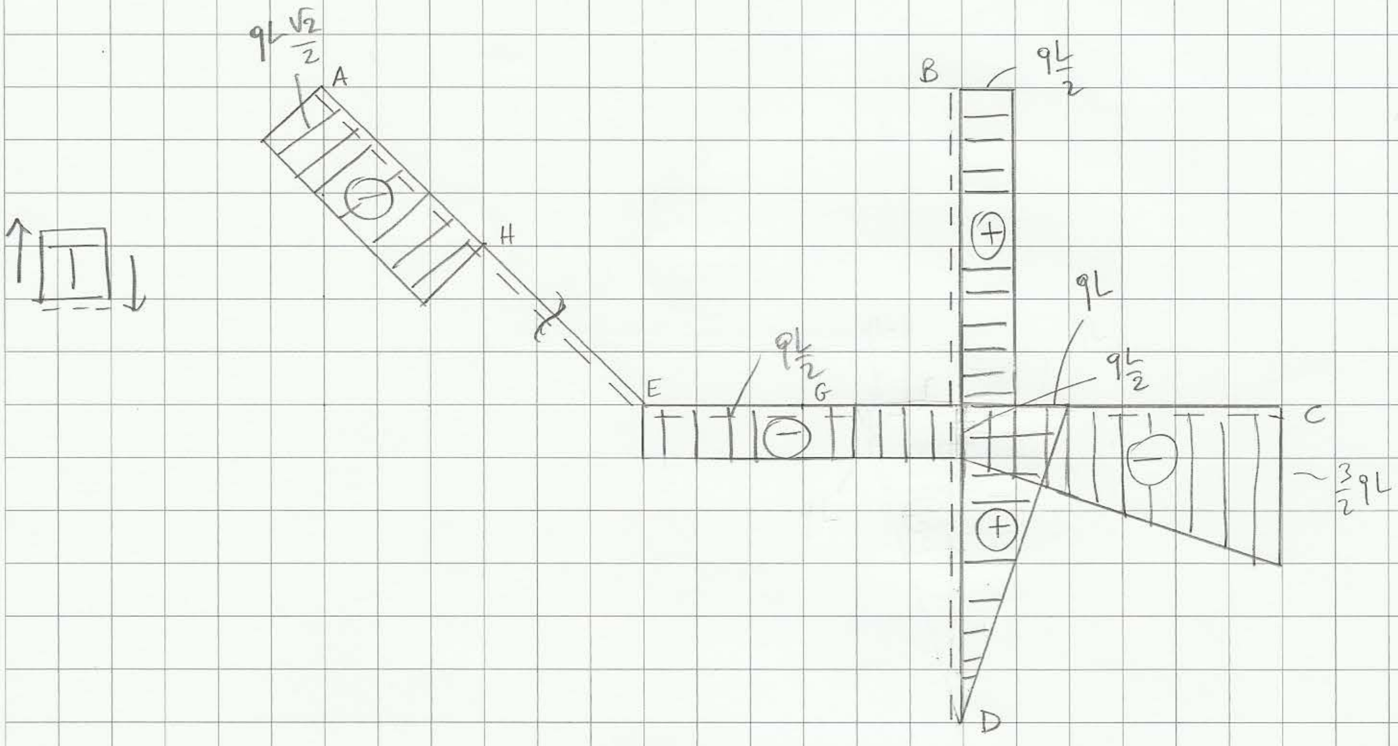


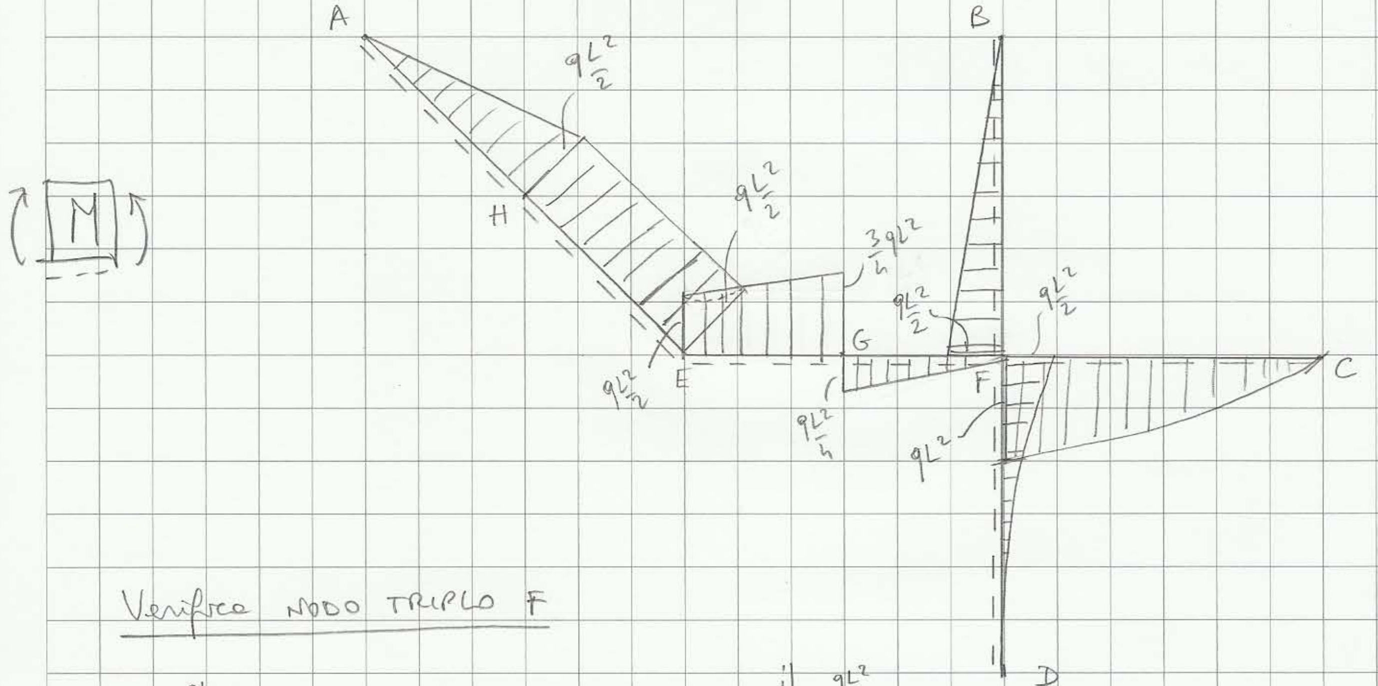
$$
\begin{cases}
\sum F_x^{(I)} = 0 \rightarrow R_{xF}^{(I)} + \frac{qL}{2} = 0 \rightarrow \boxed{R_{xF}^{(I)} = -\frac{qL}{2}} \\
\sum F_y^{(I)} = 0 \rightarrow R_{yF}^{(I)} + qL - \frac{3qL}{2} = 0 \rightarrow \boxed{R_{yF}^{(I)} = \frac{qL}{2}}
\end{cases}
$$

In definitiva si ha :

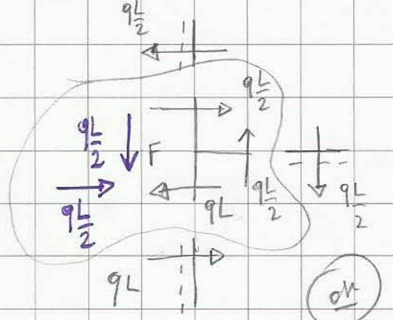


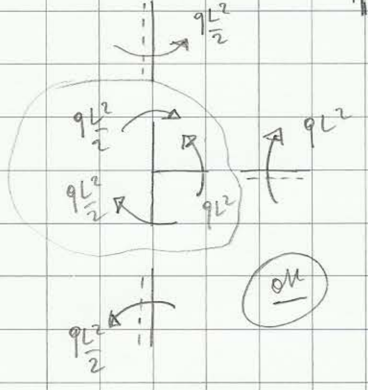






Verifica NODO TRIPLO F

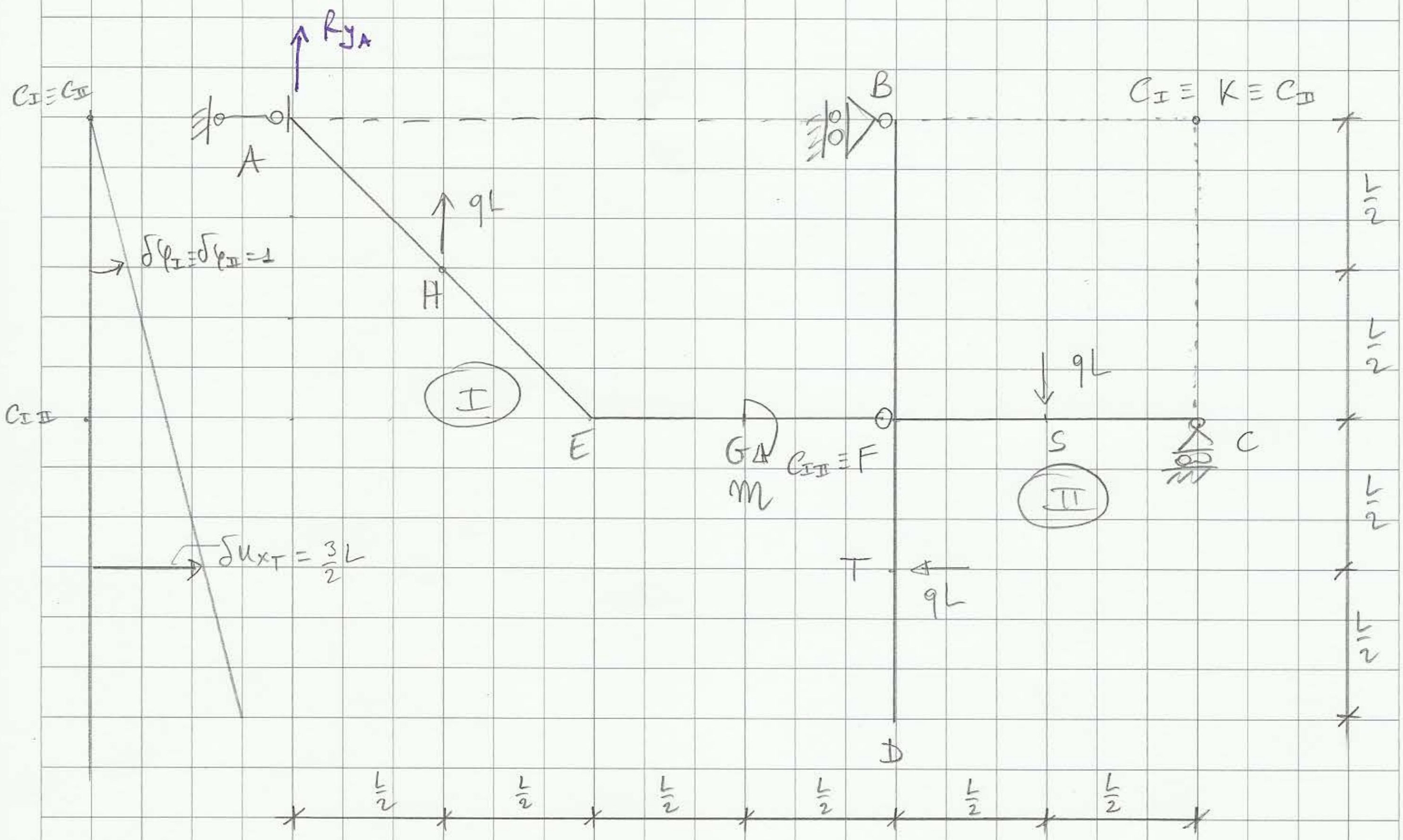


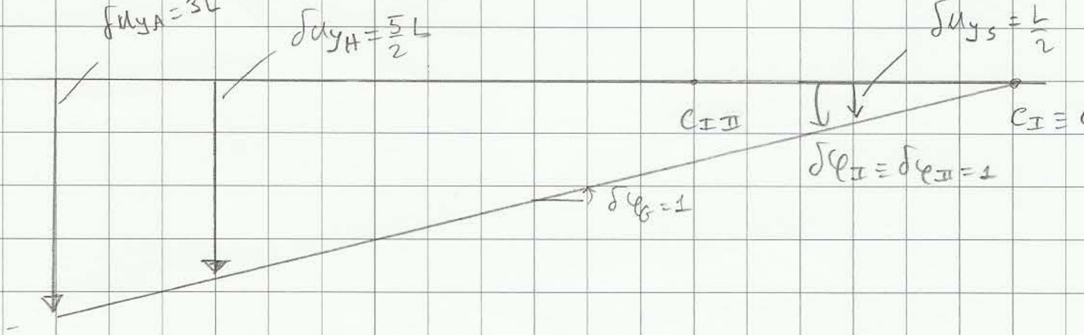


TRASLAZIONE

ROTAZIONE

$R_{y_A} = ?$





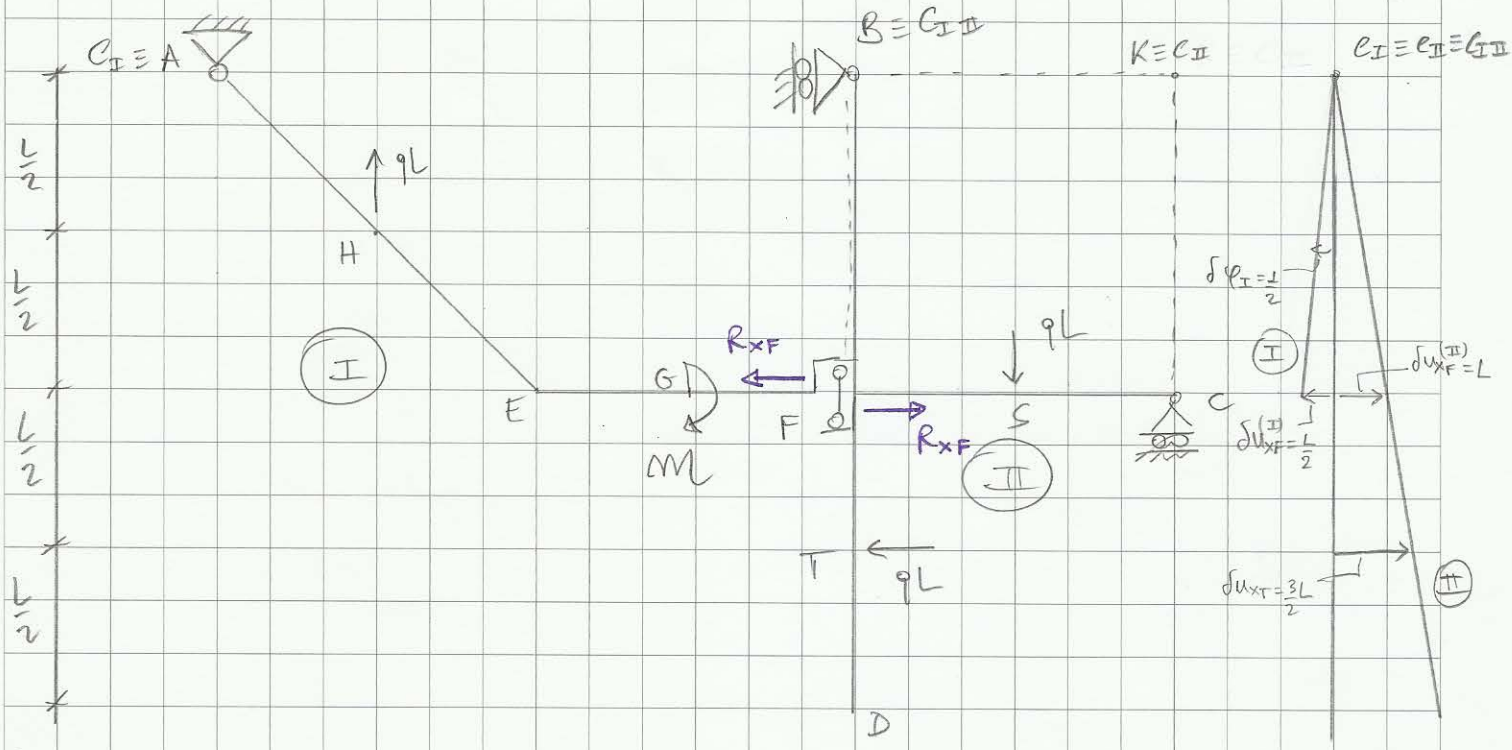
$$\delta L\Big|_{\delta\lambda=1} = 0 \leadsto -R_{y_A}\cdot\delta u_{y_A} - qL\cdot\delta u_{y_H} - qL^2\cdot\delta\varphi_G - qL\cdot\delta u_{x_T} + qL\cdot\delta u_{y_S} = 0$$

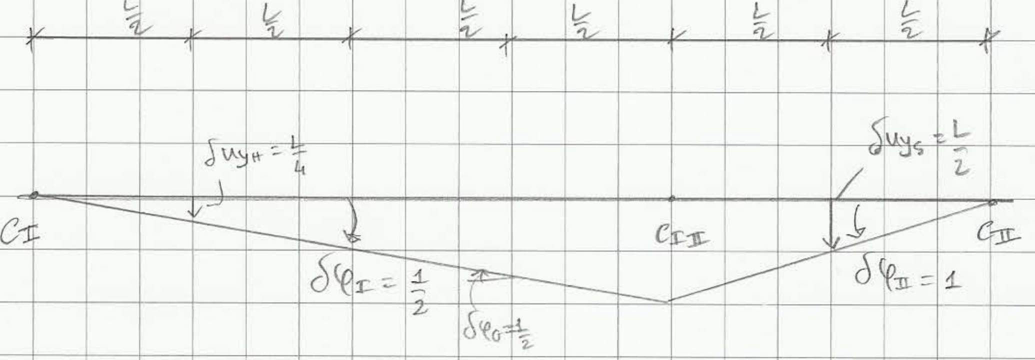
$$-R_{y_A}(3L) - \frac{5}{2}qL^2 - qL^2 - \frac{3}{2}qL^2 + q\frac{L^2}{2} = 0$$

$$R_{y_A} = \left(-5qL^2 + q\frac{L^2}{2}\right)\left(\frac{1}{3L}\right) = -\frac{3}{2}qL$$

ok

$R_{xF} = ?$



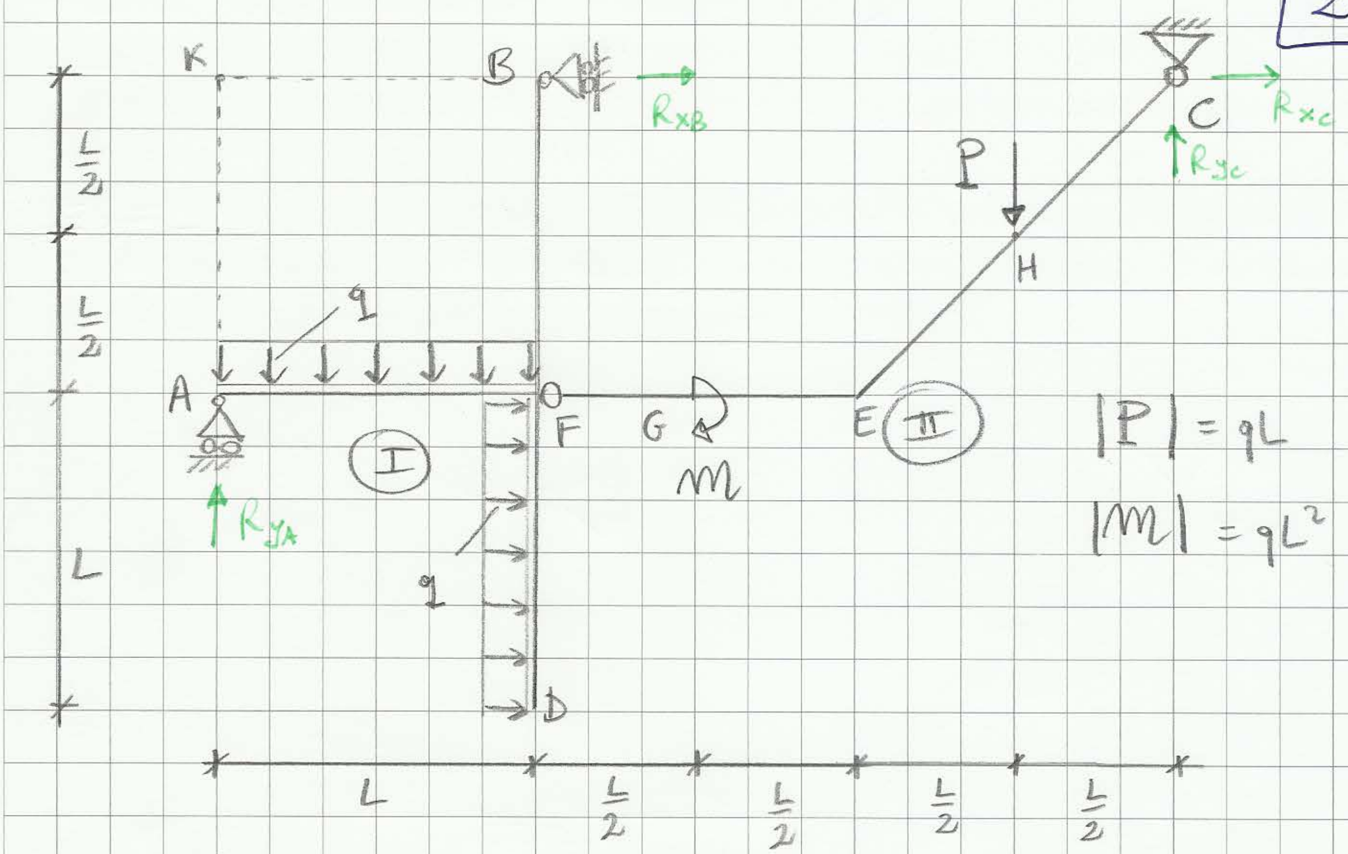


$$\delta L\Big|_{\delta\lambda=1} = 0 \rightarrow -qL\cdot\delta u_{yH} + qL^2\cdot\delta\varphi_G + R_{xF}\cdot\delta u_{xF}^{(I)} + R_{xF}\cdot\delta u_{xF}^{(II)} +$$

$$+ qL\cdot\delta u_{yS} - qL\cdot\delta u_{xT} = 0$$

$$-q\frac{L^2}{4} + q\frac{L^2}{2} + R_{xF}\left(\frac{L}{2}\right) + R_{xF}(L) + q\frac{L^2}{2} - \frac{3}{2}qL^2 = 0$$

$$R_{xF}\cdot\left(\frac{3}{2}L\right) - \frac{3}{4}qL^2 = 0 \rightarrow R_{xF} = \frac{3}{4}\cdot\frac{2}{3}\,qL = q\frac{L}{2}$$



$|P| = qL$

$|M| = qL^2$

e.N.] $\ell = 3N - M_r = 3 \cdot 2 - 6 = 0$

e.S.] $C_I \equiv K$; $C_{I\,II} \equiv F$; $C_{II} \equiv C$ } sistema isostatico

i centri non sono allineati!

1) $\sum F_x = 0 \rightsquigarrow R_{xB} + qL + R_{xc} = 0 \rightarrow \boxed{R_{xB} = \frac{5}{6}qL - qL = -\frac{qL}{6}}$

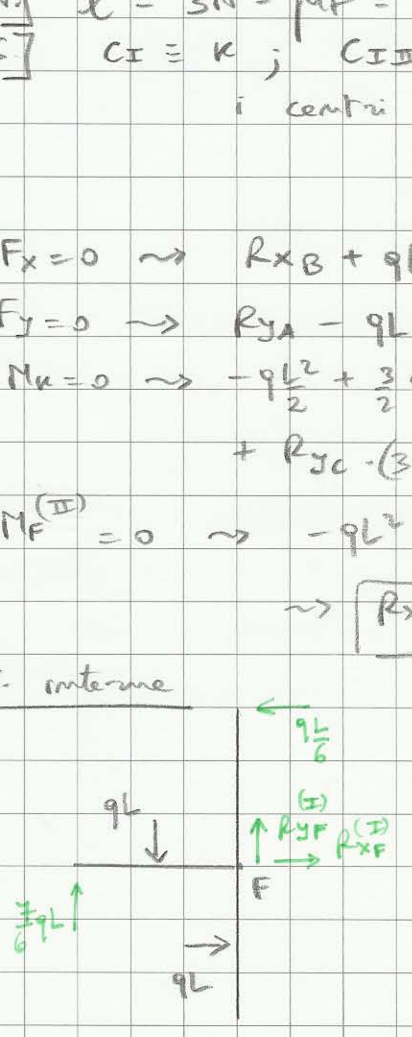
2) $\sum F_y = 0 \rightarrow R_{yA} - qL - qL + R_{yc} = 0 \rightarrow \boxed{R_{yA} = 2qL - \frac{5}{6}qL = \frac{7}{6}qL}$

3) $\sum M_K = 0 \rightsquigarrow -\frac{qL^2}{2} + \frac{3}{2}qL^2 - qL^2 - \frac{5}{2}qL^2 + R_{yc}\cdot(3L) = 0 \rightarrow \boxed{R_{yc} = \frac{5}{6}qL}$

4) $\sum M_F^{(II)} = 0 \rightsquigarrow -qL^2 - \frac{3}{2}qL^2 + \frac{5}{6}qL(2L) - R_{xc}\cdot(L) = 0$

$\rightsquigarrow \boxed{R_{xc} = \frac{-6-3+10}{6}qL = -\frac{5}{6}qL}$

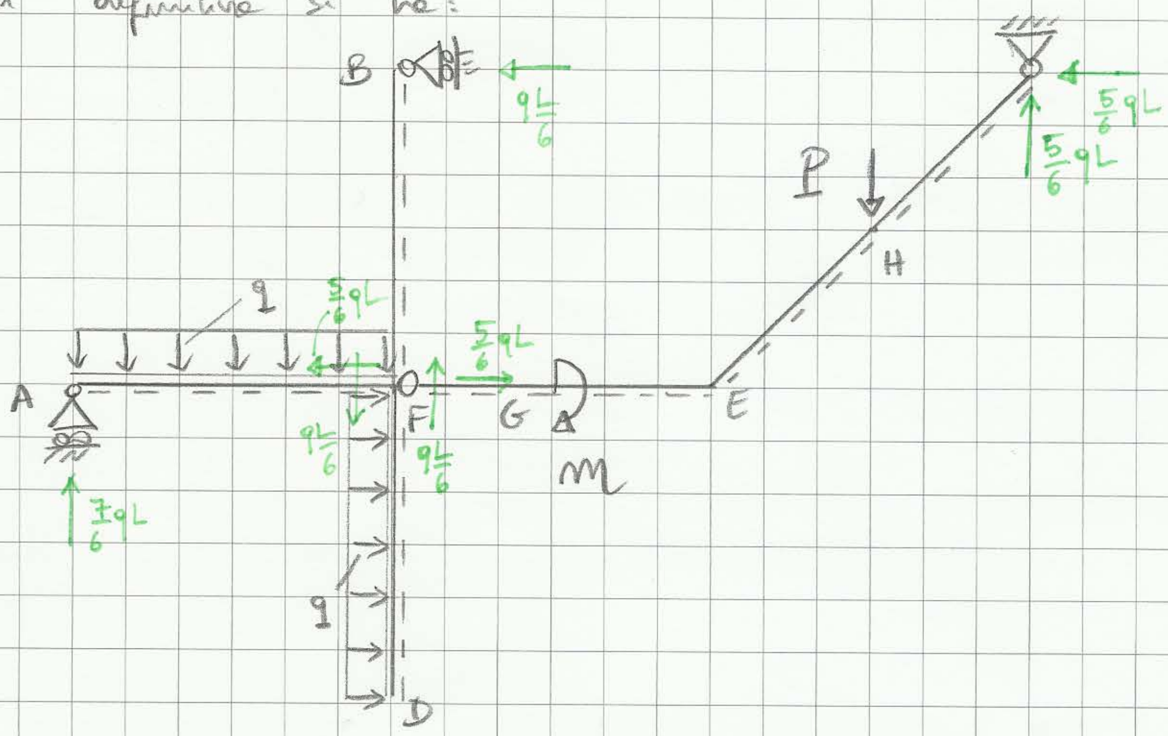
R.V. interne

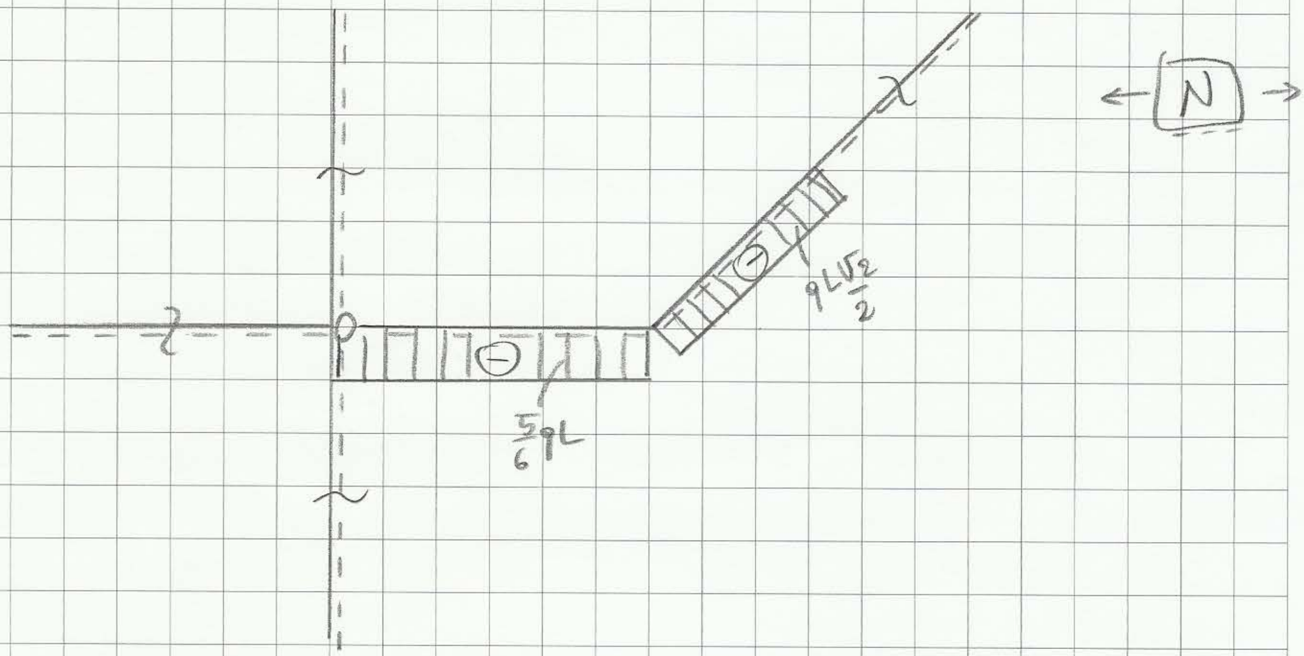


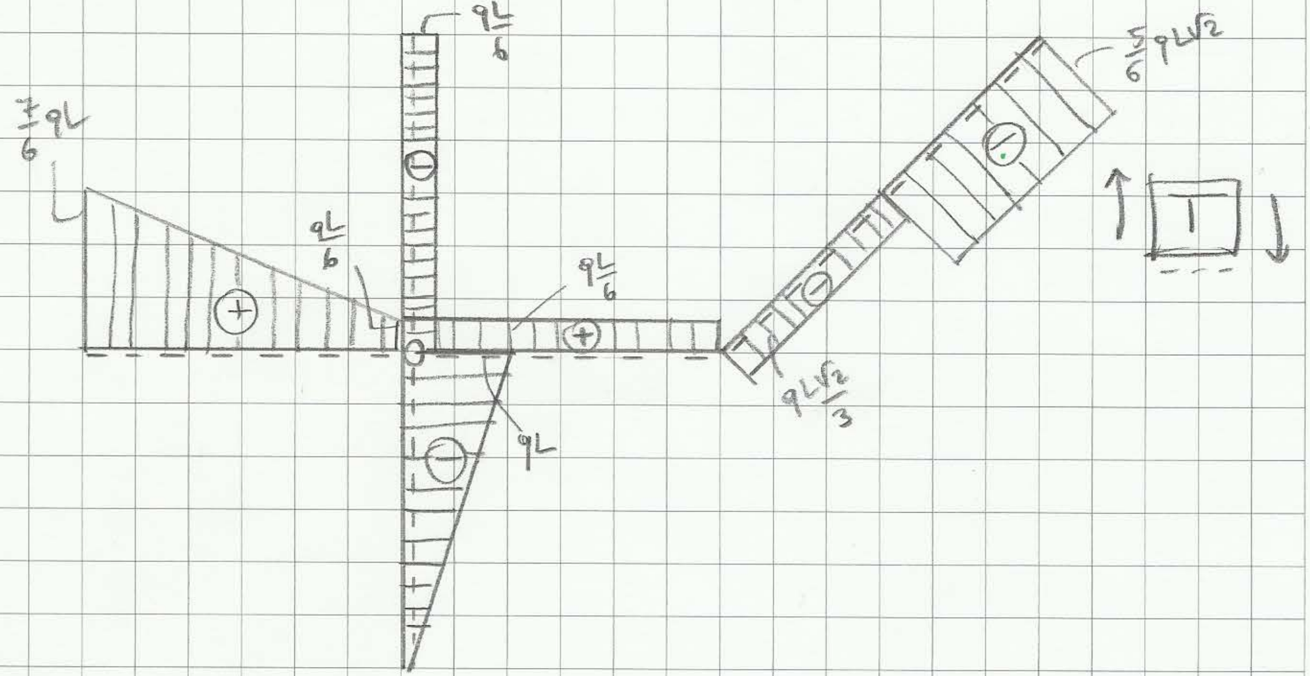
$\sum F_x^{(I)} = 0 \rightsquigarrow R_{xF}^{(I)} + qL - \frac{qL}{6} = 0 \rightsquigarrow \boxed{R_{xF}^{(I)} = -\frac{5}{6}qL}$

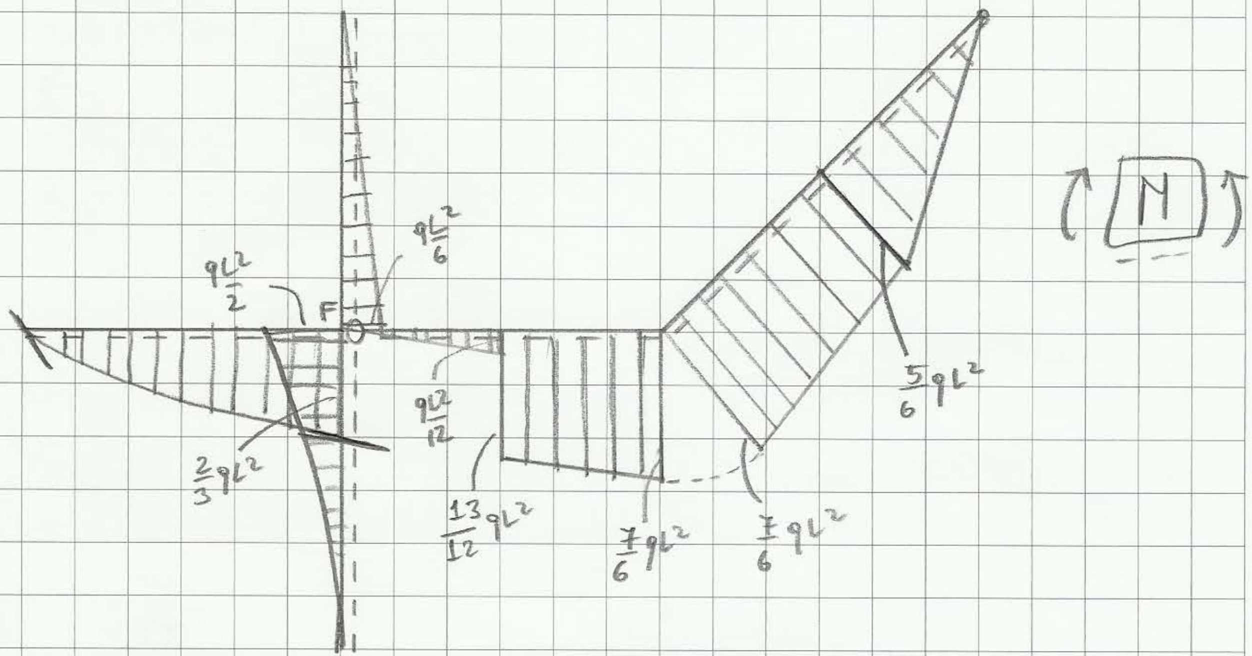
$\sum F_y^{(I)} = 0 \rightsquigarrow R_{yF}^{(I)} + \frac{7}{6}qL - qL = 0 \rightsquigarrow \boxed{R_{yF}^{(I)} = -\frac{qL}{6}}$

In definitiva si ha:

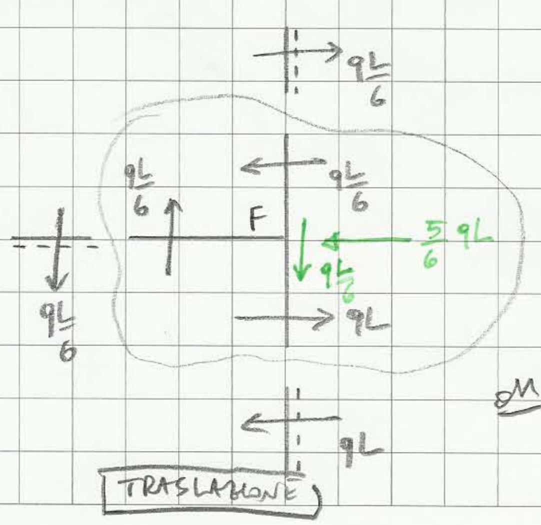


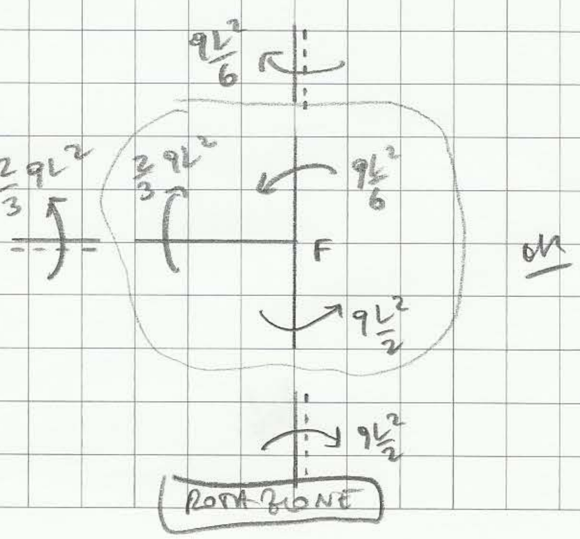






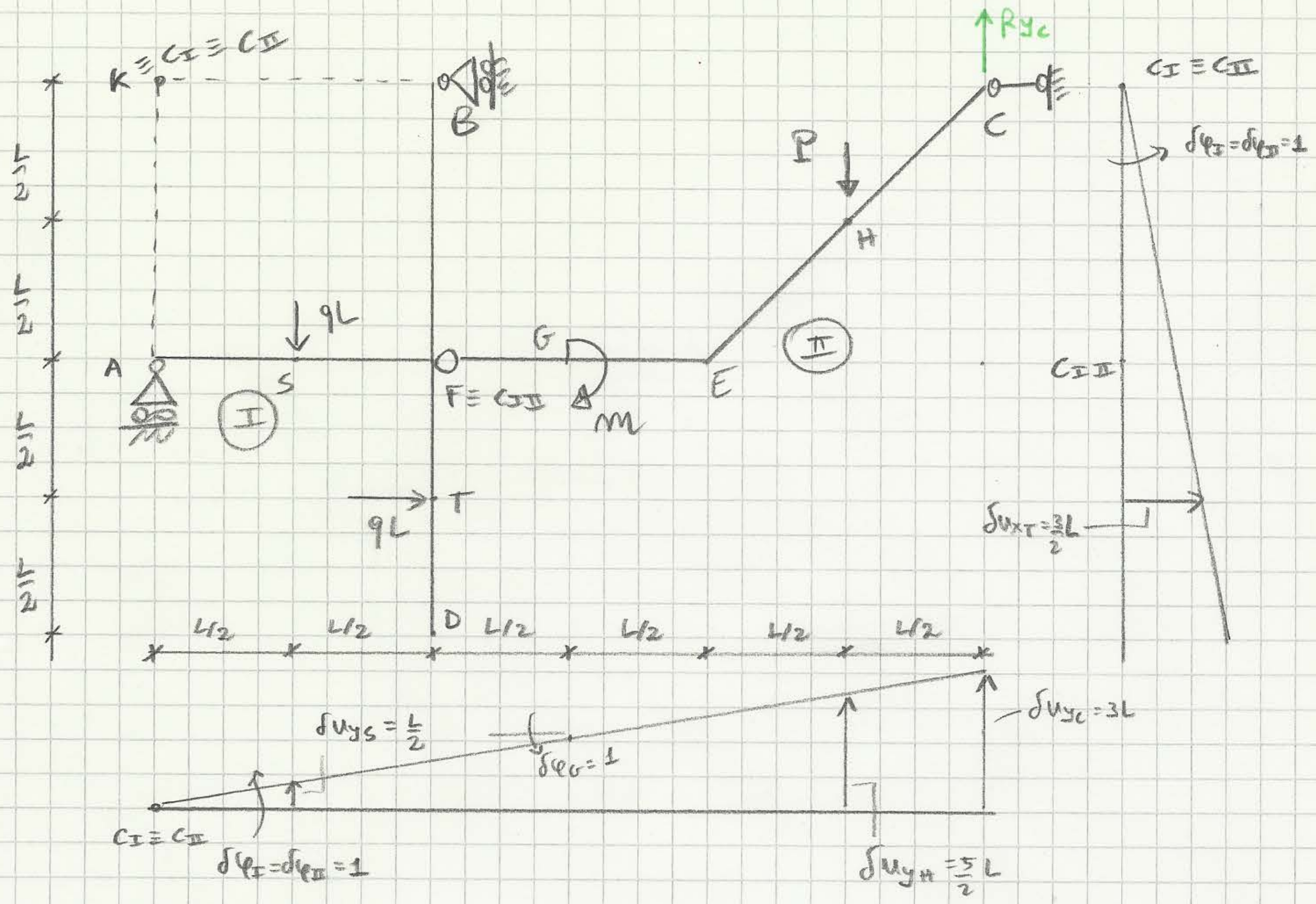
Verifica nodo triplo F





$R_{yc} = ?$

2



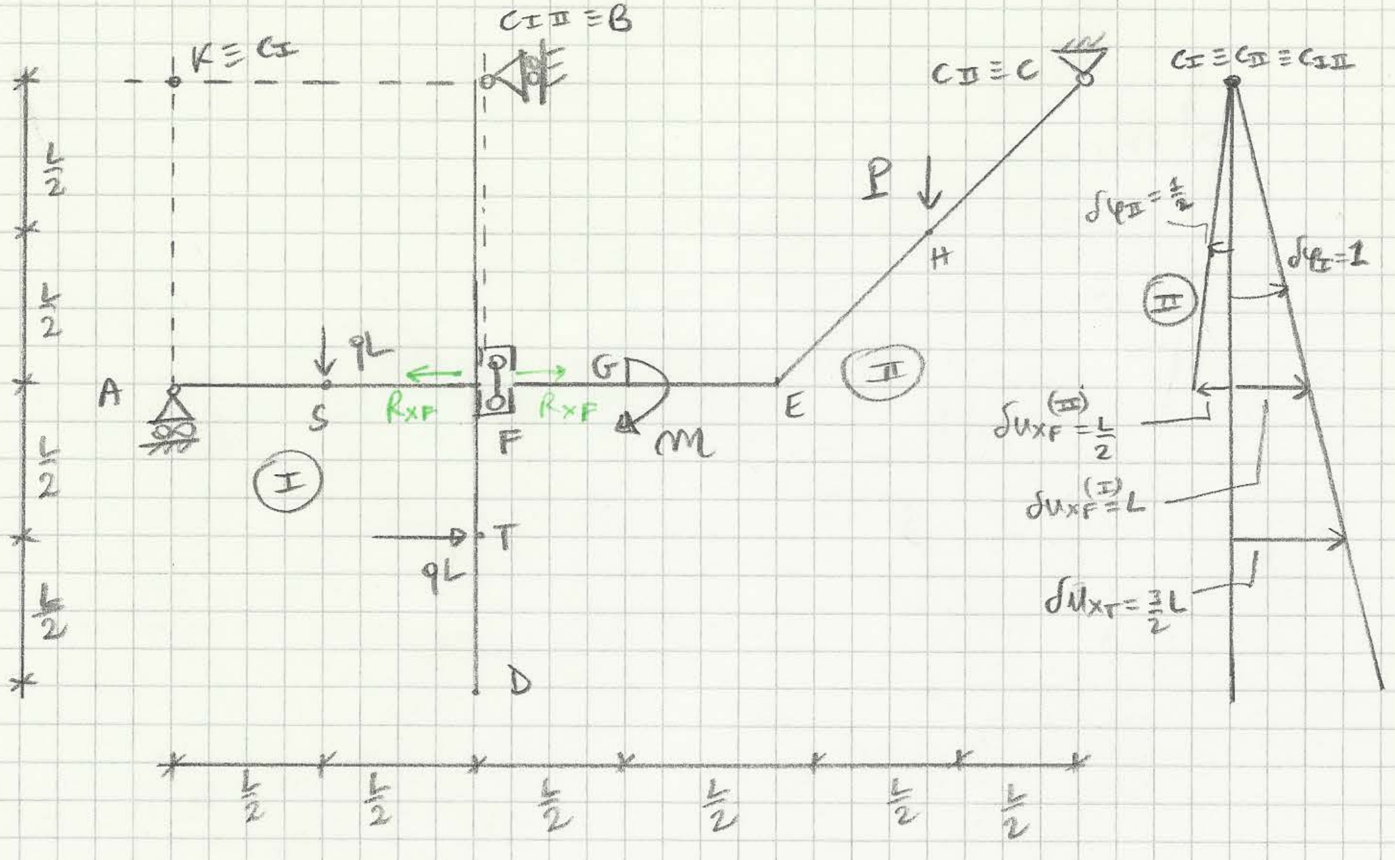
$$\delta L\Big|_{\delta\lambda=1} = 0 \rightsquigarrow R_{yc}\cdot\delta u_{yc} - qL\cdot\delta u_{yH} - qL^2\,\delta\varphi_G + qL\,\delta u_{xT} - qL\,\delta u_{yS} = 0$$

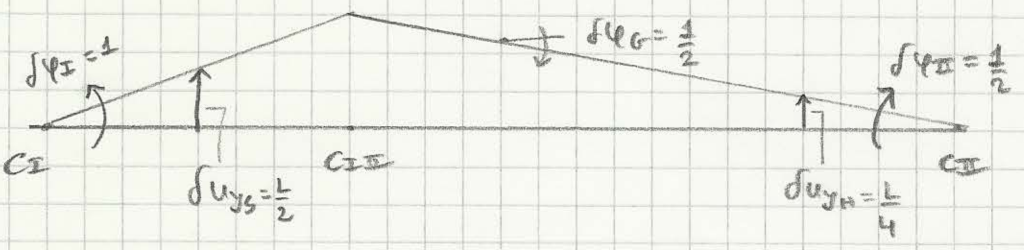
$$R_{yc}\,(3L) - \frac{5}{2}qL^2 - \cancel{qL^2} + \cancel{\frac{3}{2}qL^2} - \cancel{q\frac{L^2}{2}} = 0$$

$$R_{yc}\,(3L) = \frac{5}{2}qL^2 \rightsquigarrow \boxed{R_{yc} = \frac{5}{6}qL}$$

ok

$R_{xF} = ?$





$$\delta L\Big|_{\delta\lambda=1} = 0 \rightarrow -qL \cdot \delta u_{yS} - R_{xF} \cdot \delta u_{xF}^{(II)} - R_{xF} \cdot \delta u_{xF}^{(II)} +$$

$$+\, qL \cdot \delta u_{xT} - qL \cdot \delta u_{yH} + qL^2 \; \delta\varphi_G = 0$$

$$\Downarrow$$

$$-q\frac{L^2}{2} - R_{xF} \cdot \left(\frac{3}{2}L\right) + \frac{3}{2}qL^2 - q\frac{L^2}{4} + q\frac{L^2}{2} = 0$$

$$\Downarrow$$

$$R_{xF}\left(\frac{3}{2}L\right) = \frac{6-1}{4}\, qL^2 = \frac{5}{4}\, qL^2$$

$$\Downarrow$$

$$\boxed{R_{xF} = \frac{5}{4} qL^2 \cdot \left(\frac{2}{3L}\right) = \frac{5}{6} qL}$$

ok