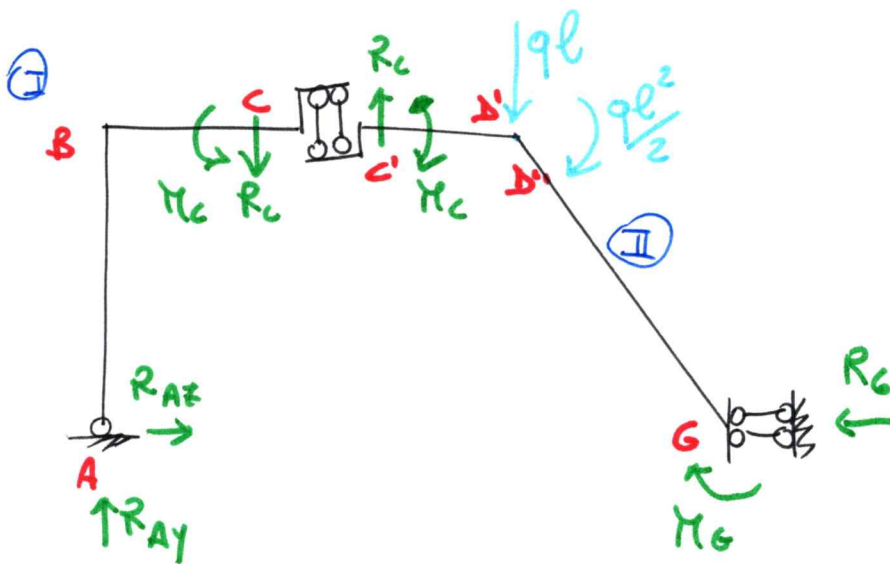
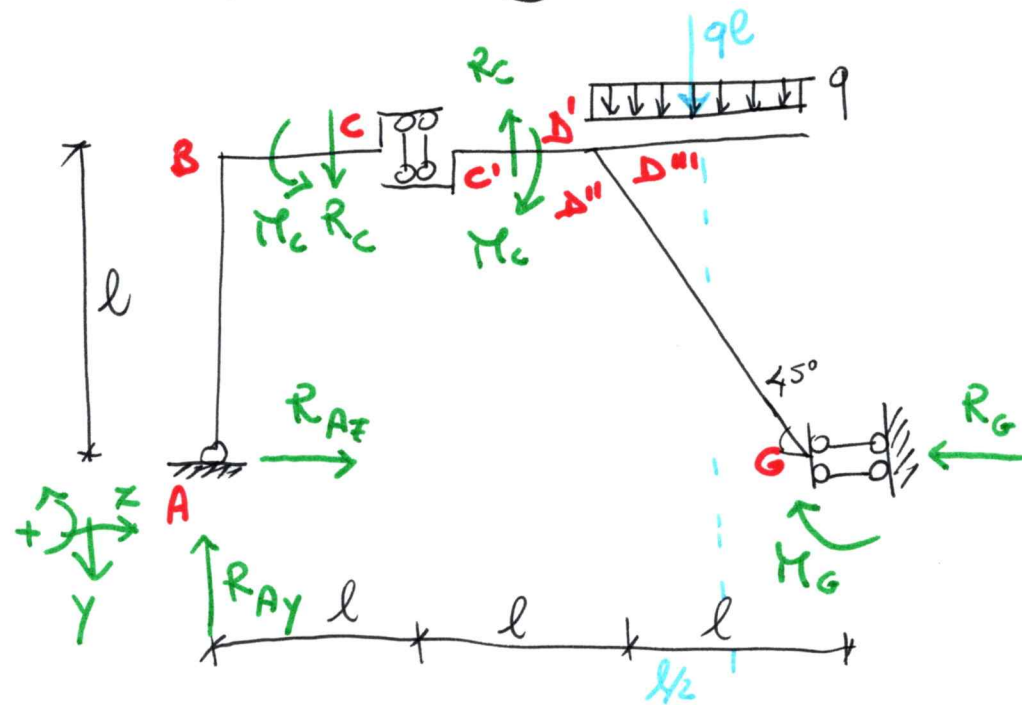


Esercizio n. 1 del 26/05/2020

(1)

Telajo piano e diagrammi N-T-M



I tronco

$$\begin{cases} \rightarrow) R_{Ax} = 0 \\ \downarrow) -R_{Ay} + R_C = 0 \\ \curvearrowright) M_C - R_C l = 0 \end{cases}$$

II tronco

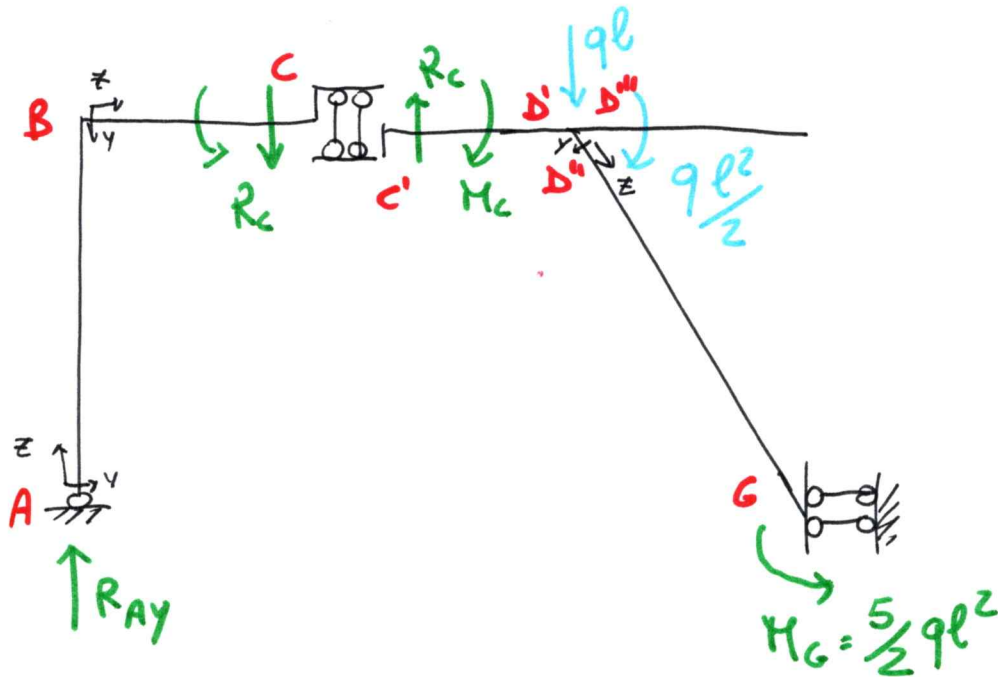
$$\begin{cases} \rightarrow) -R_G = 0 \\ \downarrow) -R_C + ql = 0 \\ \curvearrowright) -R_C 2l + ql^2 - M_C - \frac{ql^2}{2} - M_G = 0 \end{cases}$$

(2)

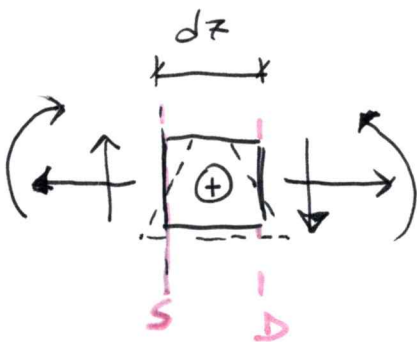
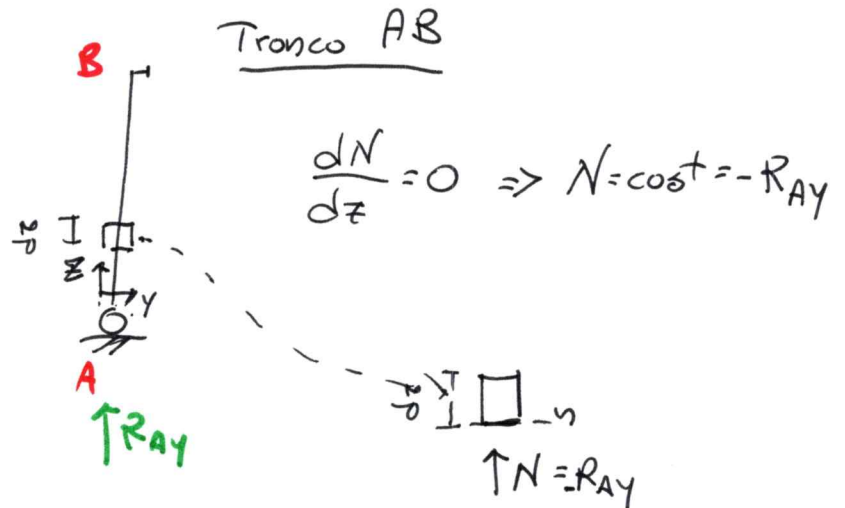
Risolvendo le 6 equazioni si ottiene:

$$R_{Ax} = 0 \quad R_c = ql \quad M_c = ql^2$$

$$R_G = 0 \quad R_{Ay} = ql \quad M_G = -\frac{5}{2}ql^2$$



$$\left\{ \begin{array}{l} \frac{dN}{dz} + q = 0 \\ \frac{dT}{dz} + q = 0 \\ \frac{dM}{dz} - T + C = 0 \end{array} \right.$$

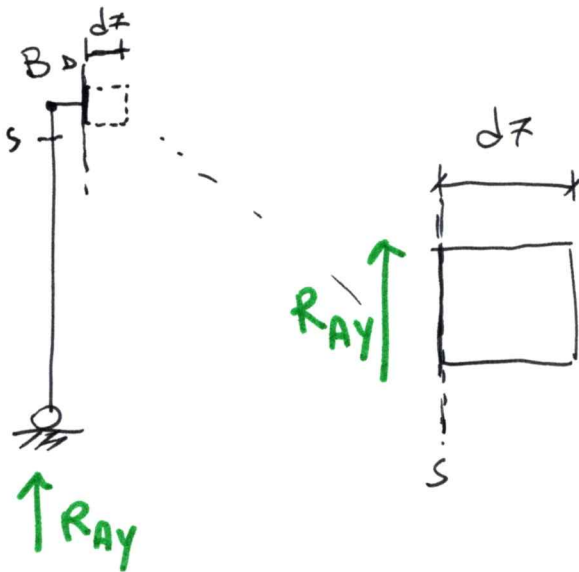


$$\frac{dT}{dz} = 0 \Rightarrow T = \text{cost} = 0$$

$$\frac{dM}{dz} = 0 \Rightarrow M = \text{cost} = 0$$

③

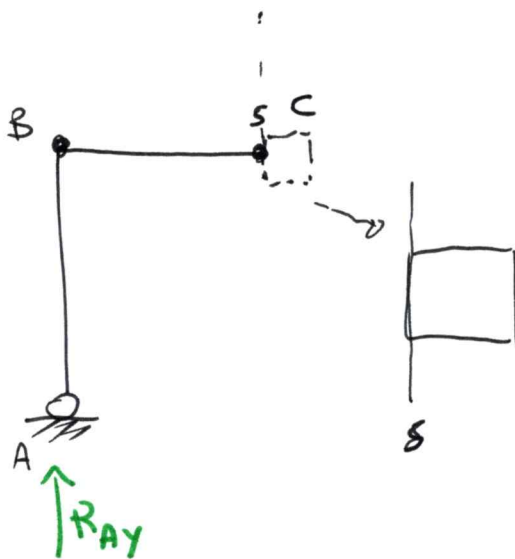
Tronco BC



$$N_B^D = 0$$

$$T_B^D = R_{Ay}$$

$$M_B^D = 0$$



$$N_C^S = 0$$

$$T_C^S = R_{Ay}$$

$$M_C^S = R_{Ay} \cdot l$$

$$\frac{dN}{dz} + p = 0 \Rightarrow \frac{dN}{dz} = 0 \Rightarrow N = \text{cost} = 0$$

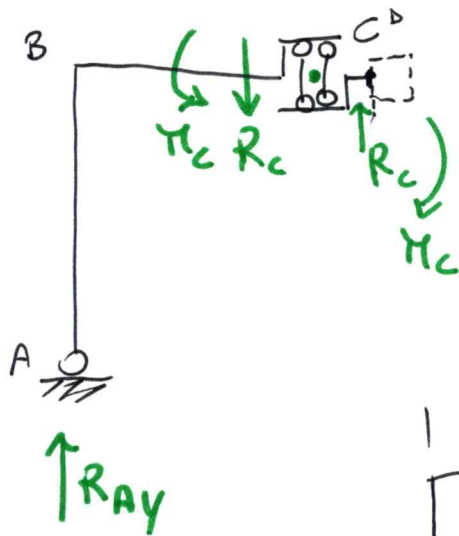
$$\frac{dT}{dz} + q = 0 \Rightarrow \frac{dT}{dz} = 0 \Rightarrow T = \text{cost} = R_{Ay}$$

$$\frac{dM}{dz} - T + \cancel{c} = 0 \Rightarrow \frac{dM}{dz} - T = 0 \Rightarrow M = T \cdot z + \text{cost.}$$

Varia linearmente con z

Tronco CD

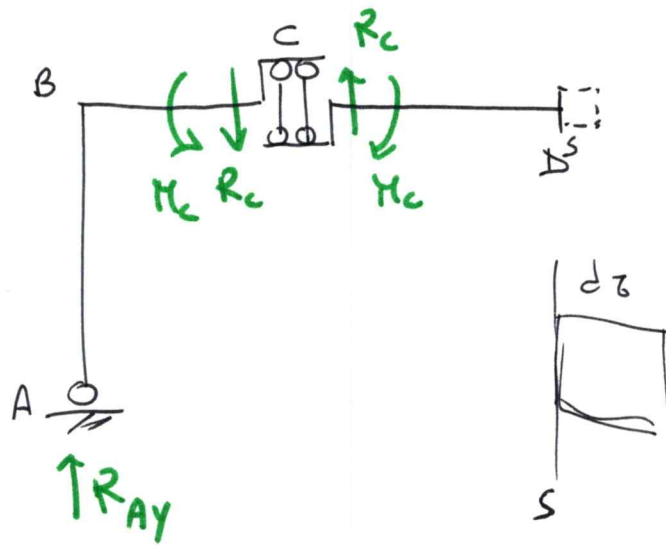
(4)



$$N_c^D = 0$$

$$T_c^D = R_{Ay} - R_c + R_c = R_{Ay} = R_c$$

$$M_c^D = R_{Ay} \cdot l - \cancel{M_c} + \cancel{M_c} = R_{Ay} l = ql^2$$

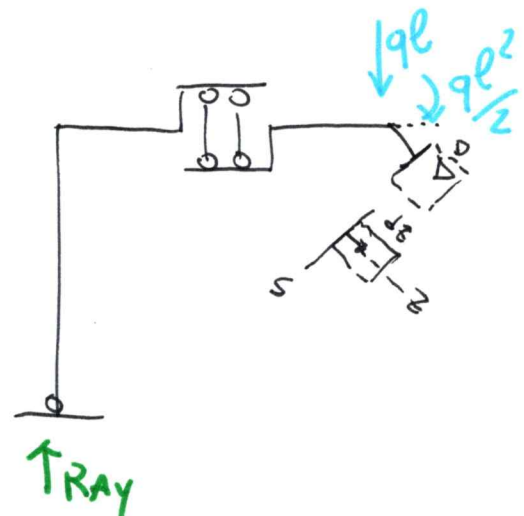
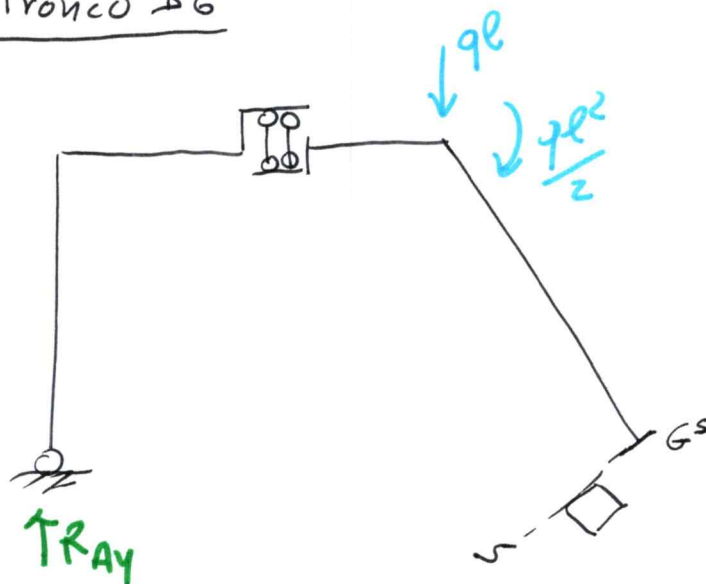


$$N_D^S = 0$$

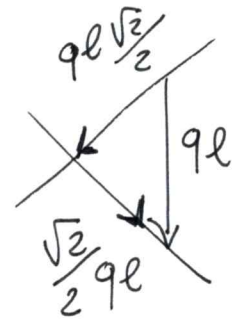
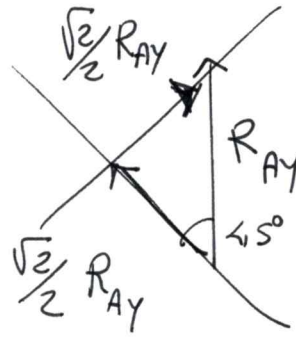
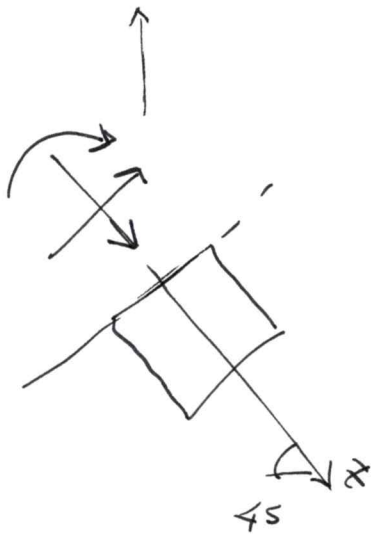
$$T_D^S = +R_{Ay}$$

$$M_D^S = R_{Ay} \cdot 2l$$

Tronco DG



(5)



$$N_{\Delta^D} = R_{AY} \frac{\sqrt{2}}{2} - ql \frac{\sqrt{2}}{2} = ql \frac{\sqrt{2}}{2} - ql \frac{\sqrt{2}}{2} = 0$$

$$T_{\Delta^D} = R_{AY} \frac{\sqrt{2}}{2} - ql \frac{\sqrt{2}}{2} = ql \frac{\sqrt{2}}{2} - ql \frac{\sqrt{2}}{2} = 0$$

$$M_{\Delta^D} = R_{AY} \cdot 2l + ql \frac{l^2}{2} = 2ql^2 + \frac{ql^2}{2} = \frac{5}{2} ql^2$$

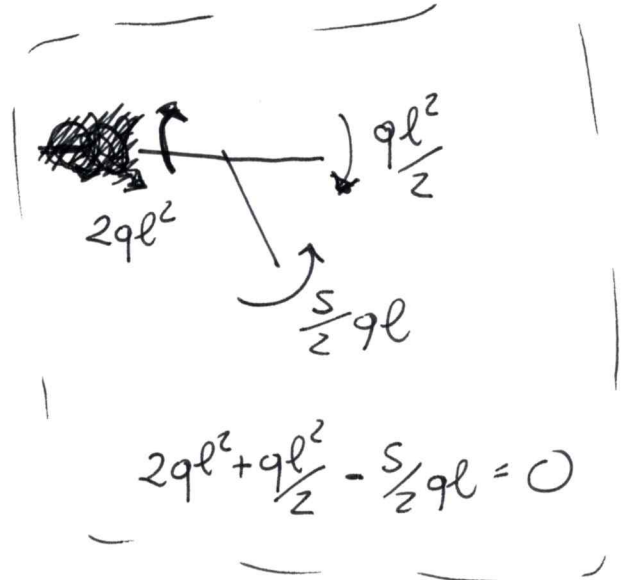
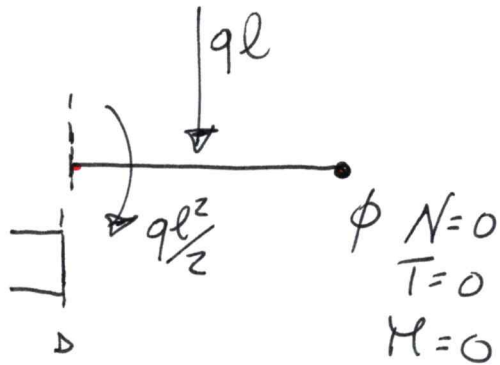
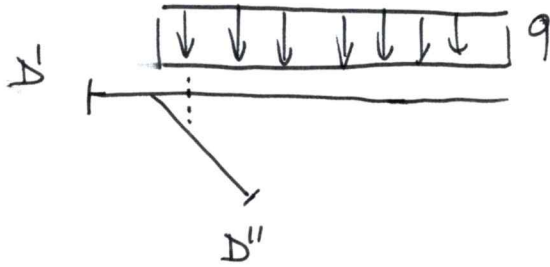
$$\left\{ \begin{array}{l} \bullet N_G^S = \frac{\sqrt{2}}{2} R_{AY} - \frac{\sqrt{2}}{2} ql = 0 \\ \bullet T_G^S = 0 \\ \bullet M_G^S = R_{AY} \cdot 3l - ql^2 + \frac{ql^2}{2} = 3ql^2 - ql^2 + \frac{ql^2}{2} = \frac{5}{2} ql^2 \end{array} \right.$$



$$\frac{5}{2} ql^2$$

$$\left\{ \begin{array}{l} \bullet N_G^S = 0 \\ \bullet T_G^S = 0 \\ \bullet M_G^S = \frac{5}{2} ql^2 \end{array} \right.$$

(6)



$$N_B = 0$$

$$T_B = +q l$$

$$M_B = -\frac{q l^2}{2}$$

$$\frac{dN}{dz} + \phi = 0 \Rightarrow N = \text{const}$$

$$\frac{dT}{dz} + q = 0 \Rightarrow T + qz = 0$$

$$\Downarrow$$

$$T = -qz + \text{const}$$

Diagramma N

(7)

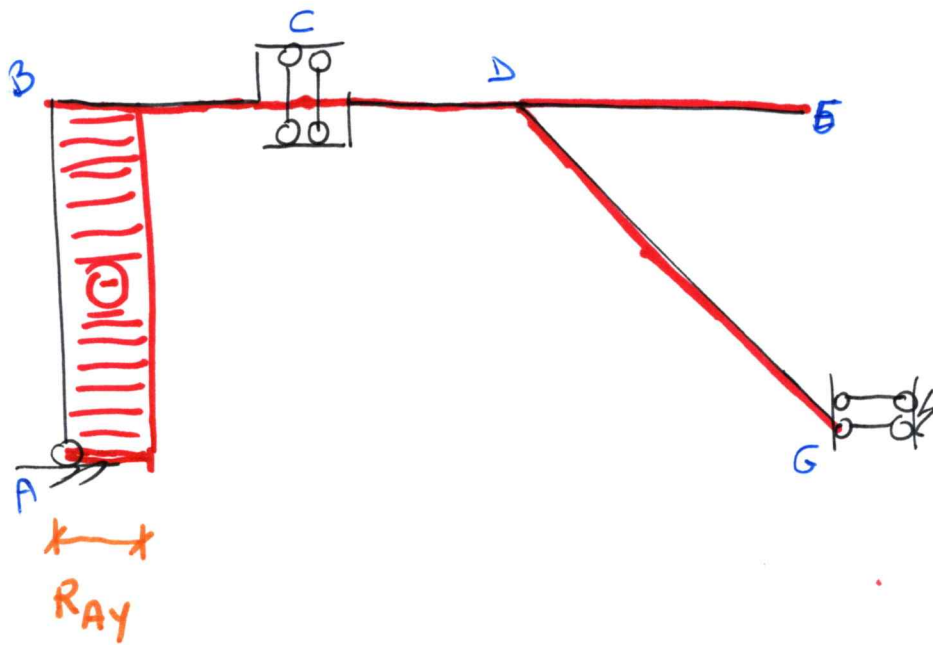


Diagramma T

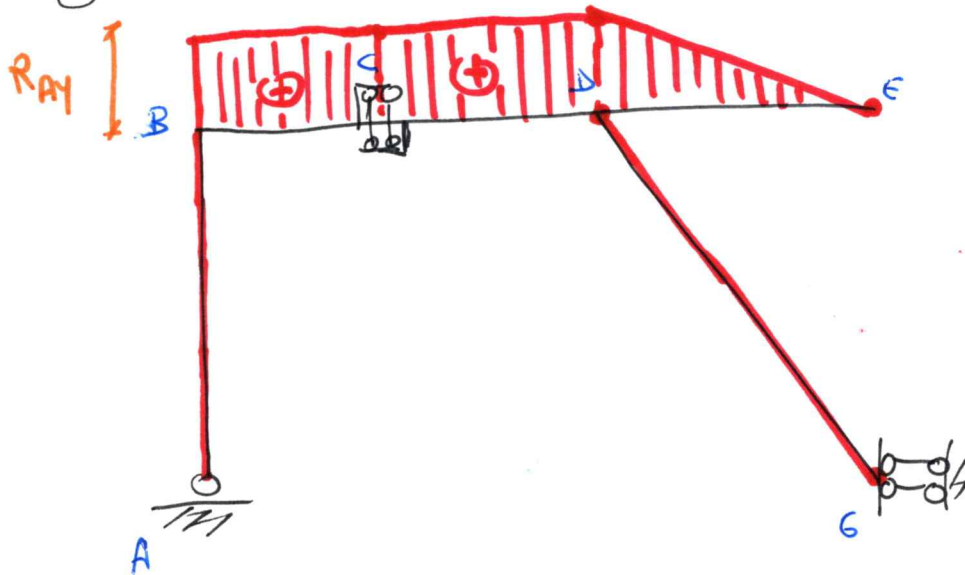


Diagramme M.

(8)

