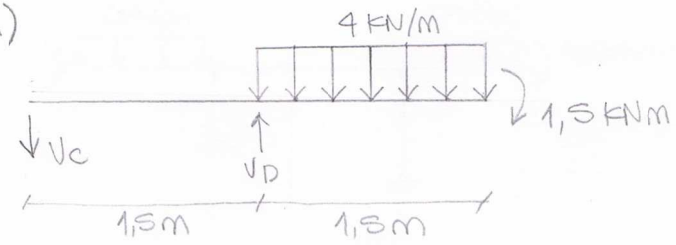
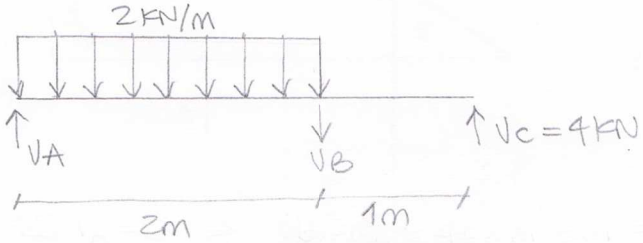
EJERCICIO 2

a)



$\Sigma M_D = 0 \Rightarrow Vc \cdot 1{,}5m = 4\,KN/m \frac{(1{,}5m)^2}{2} + 1{,}5\,KNm \Rightarrow \boxed{Vc = 4\,KN}$

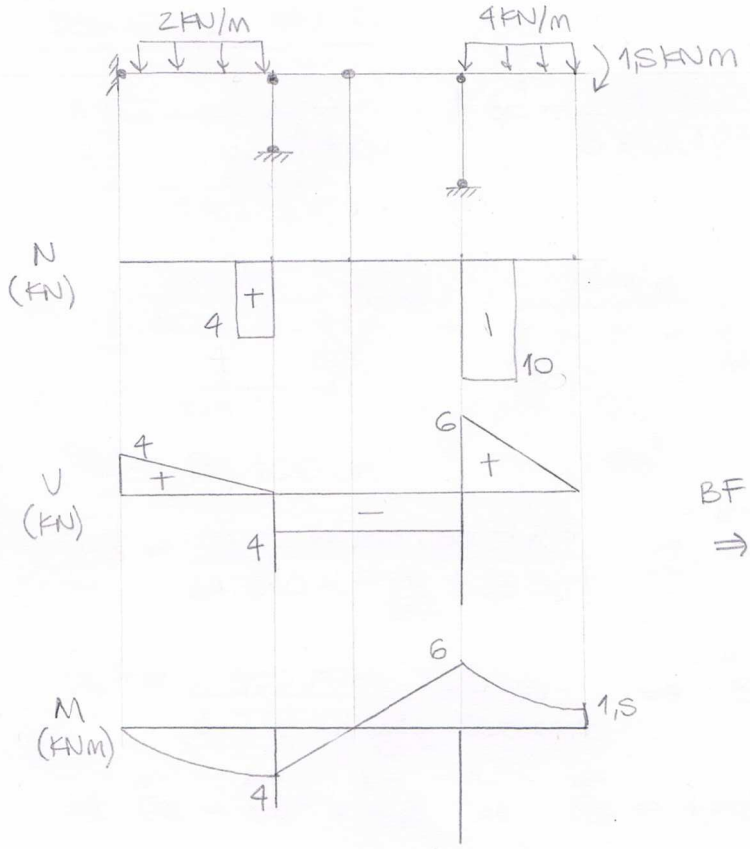
$\Sigma V = 0 \Rightarrow VD = 4\,KN + 4\,KN/m \cdot 1{,}5\,m = 0 \Rightarrow \boxed{VD = 10\,KN}$



$\Sigma M_A = 0 \Rightarrow VB \cdot 2m + 2\,KN/m \cdot \frac{(2m)^2}{2} = 4\,KNm \cdot 3m \Rightarrow \boxed{VB = 4\,KN}$

$\Sigma V = 0 \Rightarrow VA + 4\,KN = 2\,KN/m \cdot 2m + 4\,KN \Rightarrow \boxed{VA = 4\,KN}$

b)



BF Y AG SON BIELAS
⇒ NO TIENEN CORTANTE, NI MOMENTO

c) BARRAS BF Y DG

$$\sigma_{adm} \geq \frac{N}{A}$$

$$N_{max} = 10\,KN \Rightarrow A \geq \frac{10\,KN}{140 \cdot 10^3\,KN/m^2} \Rightarrow A \geq 0{,}71\,cm^2$$

$$\Rightarrow \boxed{D \geq 0{,}95\,cm}$$

BARRAS AC Y CE

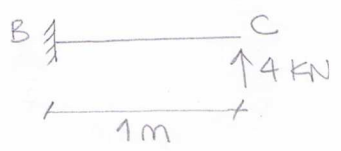
$$\sigma_{adm} \geq \frac{M}{W}$$

$$M_{max} = 6\,KNm \Rightarrow W \geq \frac{6\,KNm}{140 \cdot 10^3\,KN/m^2} \Rightarrow W \geq 42{,}86\,cm^3$$

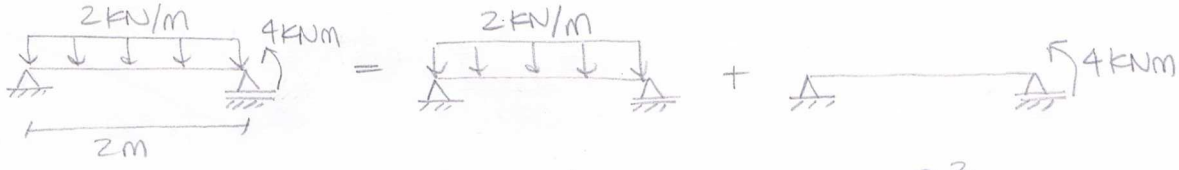
$$\Rightarrow \boxed{PNI\ 12} \Rightarrow I = 328\,cm^4$$

d)

DESCENSO EN C



$$\uparrow \delta_C^1 = \frac{4\,KN \cdot (100\,cm)^3}{3.210.10^2 \frac{KN}{cm^2} \cdot 328\,cm^4} \Rightarrow \boxed{\uparrow \delta_C^1 = 0{,}194\,cm}$$

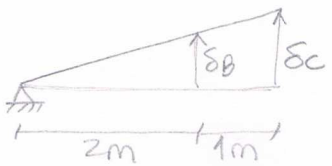


$\uparrow \delta_C^2 = \theta_B \cdot 100\,cm$ $\quad \theta_B^1 \quad \theta_B^2$

$$\overleftarrow{\theta_B^1} = \frac{9{,}02\,KN/cm\,(200\,cm)^3}{24.210.10^2 \frac{KN}{cm^2}\,328\,cm^4} \Rightarrow \overleftarrow{\theta_B^1} = 9{,}68.10^{-4}\,rad$$

$$\overleftarrow{\theta_B^2} = \frac{400\,KN\,cm \cdot 200\,cm}{3.210.10^2 \frac{KN}{cm^2} \cdot 328\,cm^4} \Rightarrow \overleftarrow{\theta_B^2} = 3{,}87.10^{-3}\,rad$$

$$\Rightarrow \overleftarrow{\theta_B} = \overleftarrow{\theta_B^1} + \overleftarrow{\theta_B^2} \Rightarrow \overleftarrow{\theta_B} = 4{,}838.10^{-3}\,rad \Rightarrow \boxed{\uparrow \delta_C^2 = 0{,}484\,cm}$$



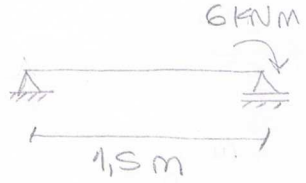
$\delta_B = \Delta l_{BF}$

$$\Delta l_{BF} = \frac{4\,KN \cdot 100\,cm}{210.10^2 \frac{KN}{cm^2}\,0{,}71\,cm^2} \Rightarrow \uparrow \delta_B = 0{,}027\,cm$$

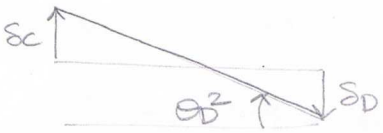
$$\delta_C^3 = \frac{3m}{2m}\,\delta_B \Rightarrow \boxed{\uparrow \delta_C^3 = 0{,}041\,cm}$$

$$\uparrow \delta_C = 0{,}194\,cm + 0{,}484\,cm + 0{,}041\,cm \Rightarrow \boxed{\uparrow \delta_C = 0{,}719\,cm}$$

GIRO EN D



$$\vec{\theta}_D^{\,1} = \frac{600\ KNcm \cdot 150\ cm}{3.210\,10^2 \frac{KN}{cm^2} \cdot 328\ cm^4} \Rightarrow \boxed{\vec{\theta}_D^{\,1} = 4{,}36 \cdot 10^{-3}\ rad}$$



$$\vec{\theta}_D^{\,2} = \frac{\delta c + \delta D}{L_{DC}}$$

$$\delta_D = \Delta l_{DG} = \frac{10\ KN \cdot 150\ cm}{2{,}1\,10^2 \frac{KN}{cm^2} \cdot 0{,}71\ cm^2} \Rightarrow \delta_D = 0{,}10\ cm$$

$$\vec{\theta}_D^{\,2} = \frac{0{,}719\ cm + 0{,}10\ cm}{150\ cm} \Rightarrow \boxed{\vec{\theta}_D^{\,2} = 5{,}46 \cdot 10^{-3}\ rad}$$

$$\vec{\theta}_D = 4{,}36 \cdot 10^{-3}\ rad + 5{,}46 \cdot 10^{-3}\ rad \Rightarrow \boxed{\vec{\theta}_D = 9{,}82 \cdot 10^{-3}\ rad}$$