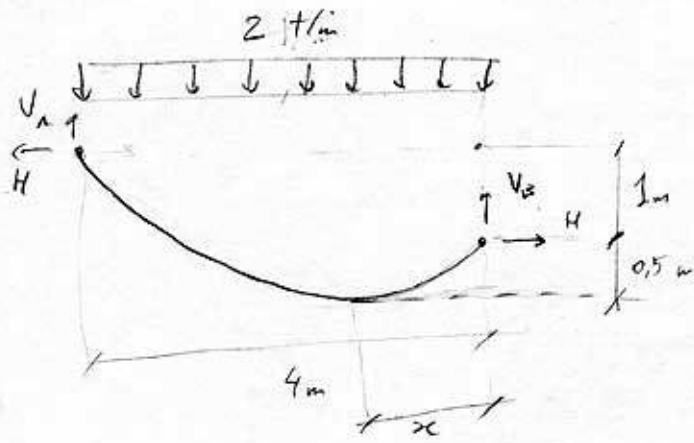


Ejercicio 1



$$\frac{d^2y}{dx^2} = \frac{q}{H} \Rightarrow y = \frac{q}{2H} x^2 + Ax + B$$

$$x=0 \quad y=0 \Rightarrow B=0$$

$$x=4m \Rightarrow y=-1m$$

$$\Rightarrow -1m = \frac{q}{2H} 16m^2 + A 4m$$

$$y' = \frac{q x}{H} + A$$

$$y'=0 \Rightarrow \bar{x} = -\frac{A H}{q}$$

$$\Rightarrow y(\bar{x}) = \frac{q}{2H} \frac{A^2 H^2}{q^2} - \frac{A^2 H}{q} = +\frac{A^2 H}{2q} = +1,5m$$

$$\hookrightarrow H = \frac{3q}{A^2}$$

$$\Rightarrow \frac{q}{2} \frac{A^2}{3q} 16m^2 + A 4m + 1m = 0$$

$$\frac{8}{3} A^2 + 4A + 1 = 0$$

$$\frac{-4 \pm \sqrt{16 - \frac{4 \cdot 8}{3}}}{2 \cdot \frac{8}{3}} = \begin{cases} -0,317 \rightarrow H = 59,7 \\ -1,183 \rightarrow H = 4,28 \\ \hookrightarrow \bar{x} = 7,46 \\ \hookrightarrow 2,536 = \bar{x} \end{cases}$$

$$\Rightarrow y = \frac{2t/m}{2 \cdot 4,28} x^2 - 1,183 x$$

$$y = 0,234 \frac{t}{m} x^2 - 1,183 x$$

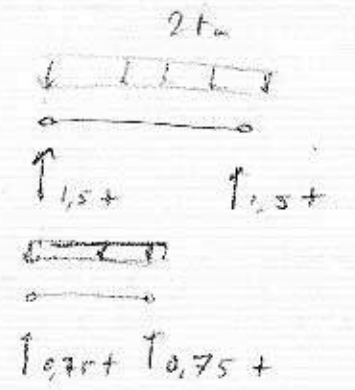
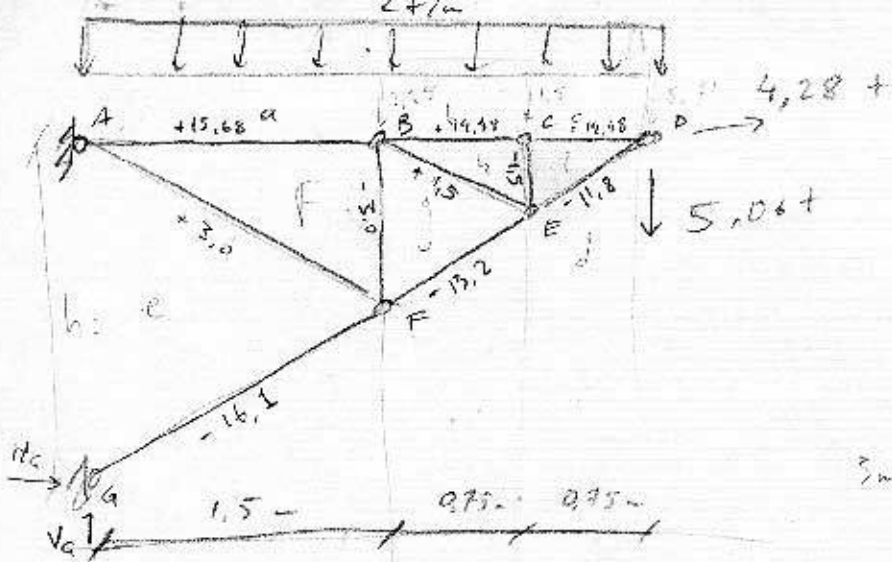
$$\Rightarrow H = 4,28 t \quad t_g(0) = A = -1,183 = -\frac{V_A}{H} \Rightarrow V_A = 1,183 \cdot 4,28 t$$

$$V_A = 5,06 t$$

$$t_g(4m) = \frac{2t/m \cdot 4m}{4,28} - 1,183 = 0,686 \Rightarrow V_B = 0,686 \cdot 4,28$$

$$V_B = 2,94 t$$

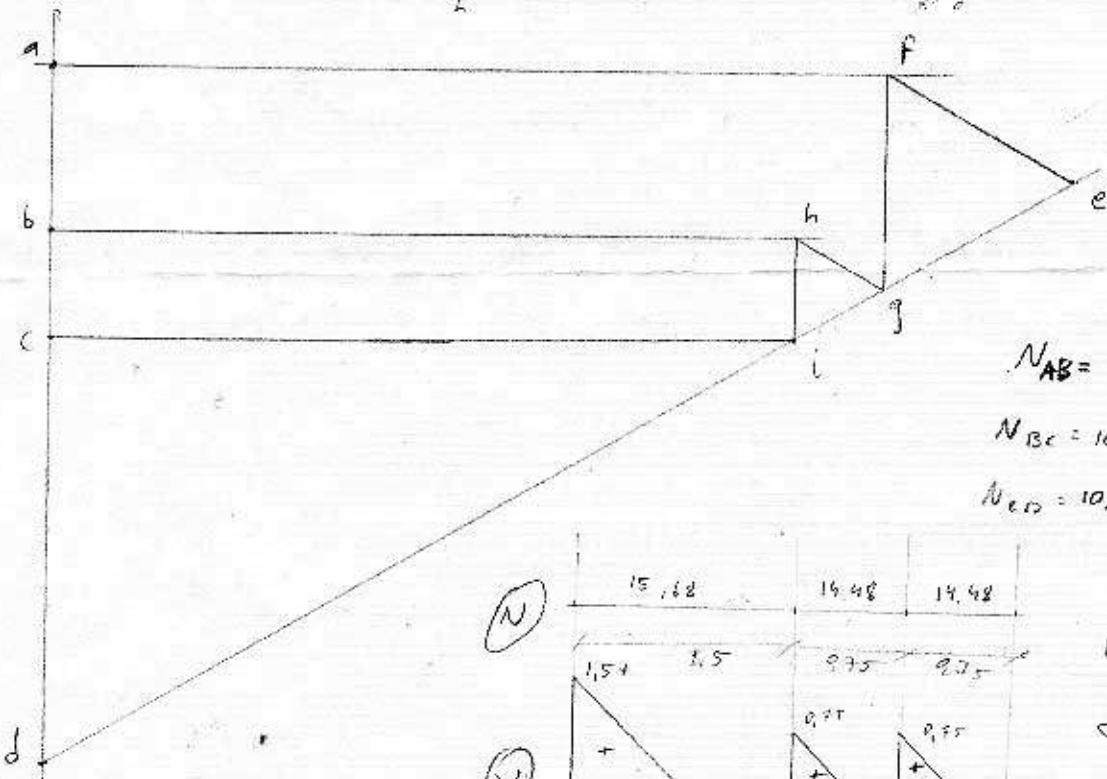
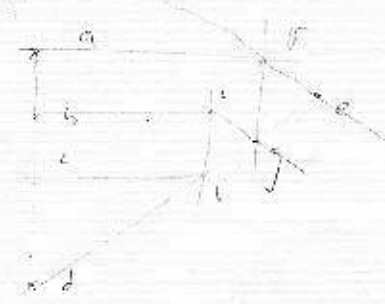
$$V_A + V_B = 8 t \quad \checkmark$$



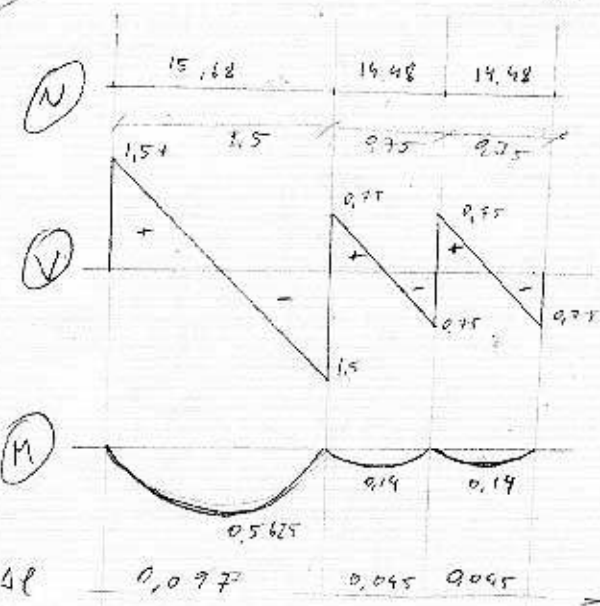
$\sum \text{mom}(\omega) = 0 \Rightarrow H = 1,732$

$H_A = \frac{2 \cdot 3 \cdot 1,5 + 5,06 \cdot 3}{1,732} = 13,96$

$\cos(30) = \frac{H_A}{F_{AF}}$
 $\Rightarrow F_{AF} = 16,12$



$N_{AB} = 11,4 + 4,28 = 15,68$
 $N_{BC} = 10,2 + 4,28 = 14,48$
 $N_{CD} = 10,2 + 4,28 = 14,48$

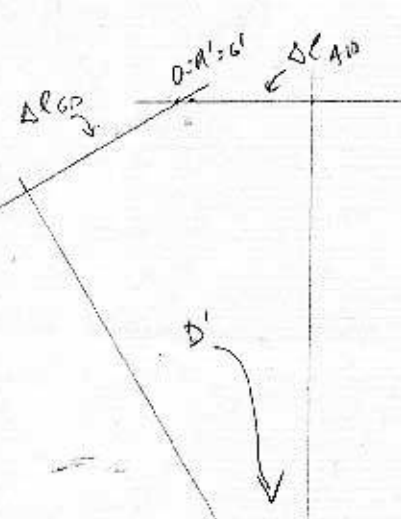


$|N_{max}| = 16,1 +$
 $\Delta = 0,4 \frac{H_{max}}{A} = \frac{16,1}{A}$
 $\Rightarrow A \geq 11,5 \text{ cm}^2$
 $\Rightarrow b = 3,39 \approx 3,4 \text{ cm}$
 $\Rightarrow A = 11,56 \text{ cm}^2$
 $E = 2,1 \cdot 10^3 + / -$

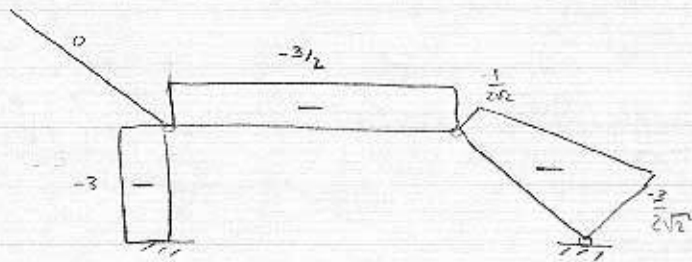
Barren	GF	FE	ED
l	1,732	0,866	0,866
N	-16,1	-13,2	-11,8
	-0,115	-0,047	0,042

$\Rightarrow \Delta l_{AD} = 0,187 \text{ cm}$

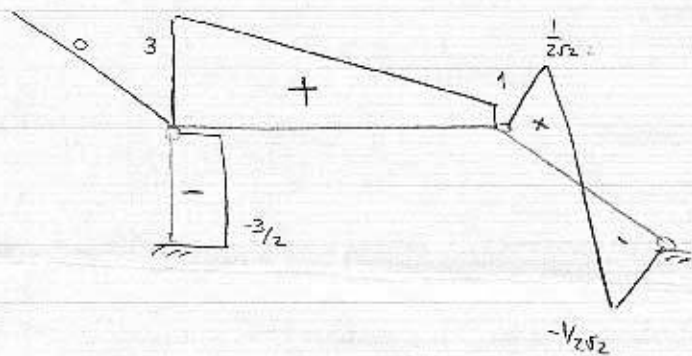
$\Rightarrow \Delta l_{GD} = 0,204 \text{ cm}$



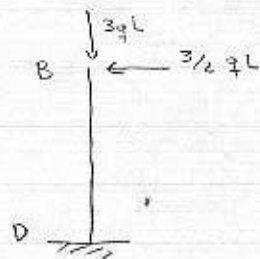
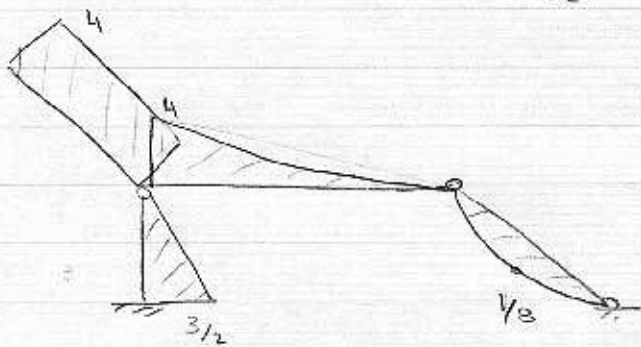
$\frac{N}{qL}$



$\frac{V}{qL}$



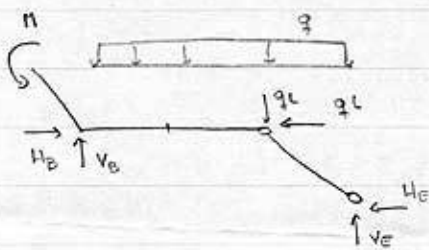
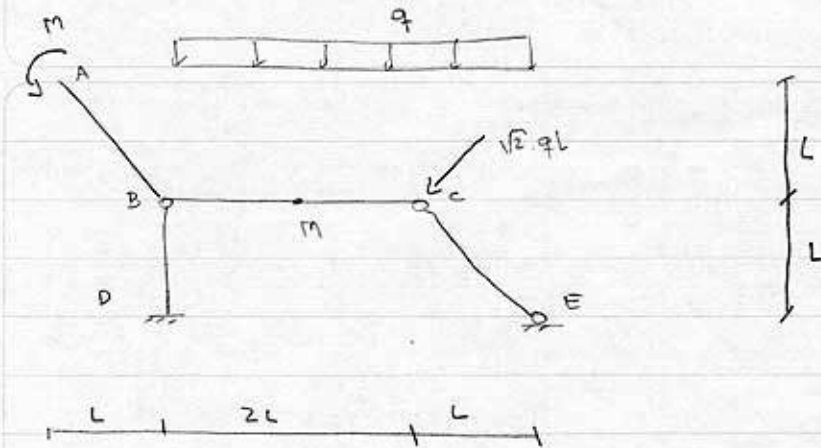
$\frac{M}{qL^2}$



$$\delta_B = \frac{PL^2}{3EI} = \frac{\frac{3}{2} qL \cdot L^2}{3EI} = \frac{qL^4}{2EI} = \delta_B$$

$$\delta_B = \frac{FL}{EA} = \frac{3qL \cdot L}{EA} = \frac{3qL^2}{EA} = \delta_B$$

Ejercicio 3

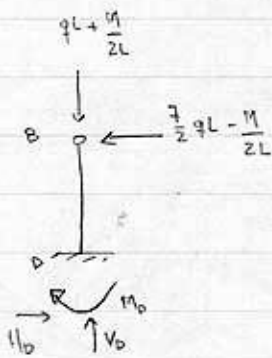


$$M_C^{der} = 0 \quad V_B \cdot 2L = 2qL^2 + M \Rightarrow \underline{V_B = qL + \frac{M}{2L}}$$

$$\sum V = 0 \quad V_B + V_E = 4qL \rightarrow \underline{V_E = 3qL - \frac{M}{2L}}$$

$$M_C^{der} = 0 \quad V_E \cdot L = H_E \cdot L + \frac{qL^2}{2} \Rightarrow \underline{H_E = \frac{3}{2}qL - \frac{M}{2L}}$$

$$\sum H = 0 \Rightarrow H_B = H_E + qL = \frac{7}{2}qL - \frac{M}{2L}$$



$$\sum H = 0 \Rightarrow H_D = \frac{7}{2}qL - \frac{M}{2L}$$

$$\sum V = 0 \Rightarrow V_D = qL + \frac{M}{2L}$$

$$\sum M_D = 0 \Rightarrow \underline{M_D = \frac{7}{2}qL^2 - \frac{M}{2}}$$

$$\underline{M_{reactor} \text{ on } M = V_B \cdot L - M - \frac{qL^2}{2} = \frac{qL^2}{2} - \frac{M}{2}}$$

$$\Rightarrow |M_{reactor}| = |M| \rightarrow \frac{7}{2}qL^2 - \frac{M}{2} = \frac{qL^2}{2} - \frac{M}{2} \rightarrow \underline{No}$$

$$\rightarrow -\frac{7}{2}qL^2 + \frac{M}{2} = \frac{qL^2}{2} - \frac{M}{2} \rightarrow \underline{M = 4qL^2}$$

