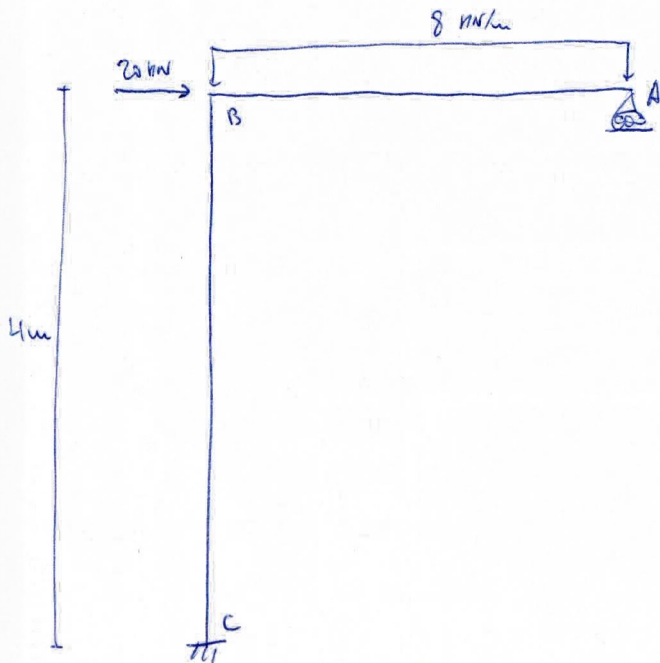
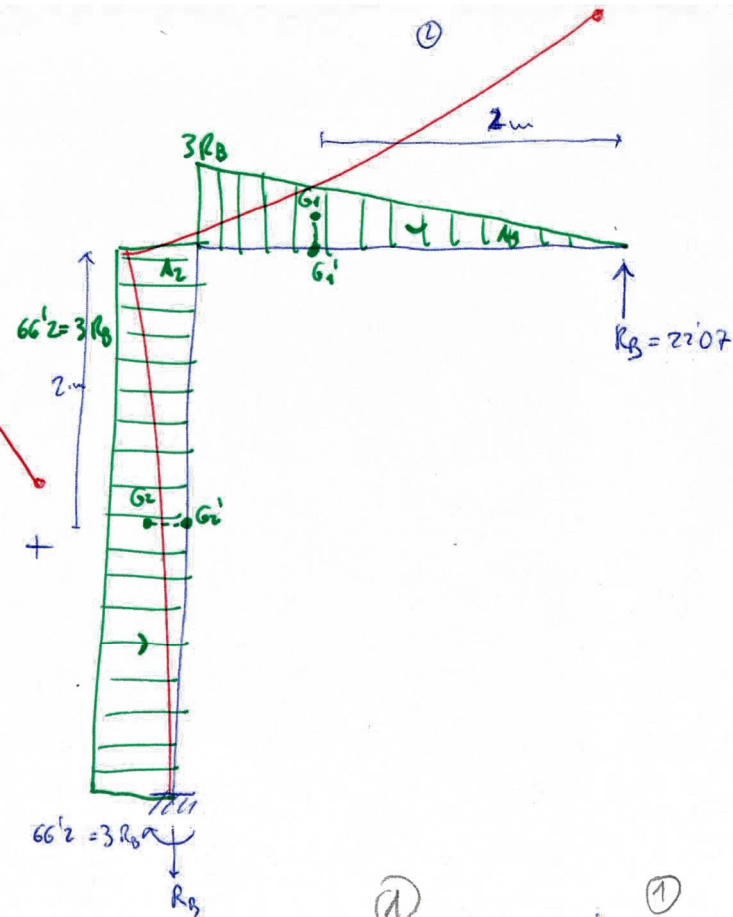
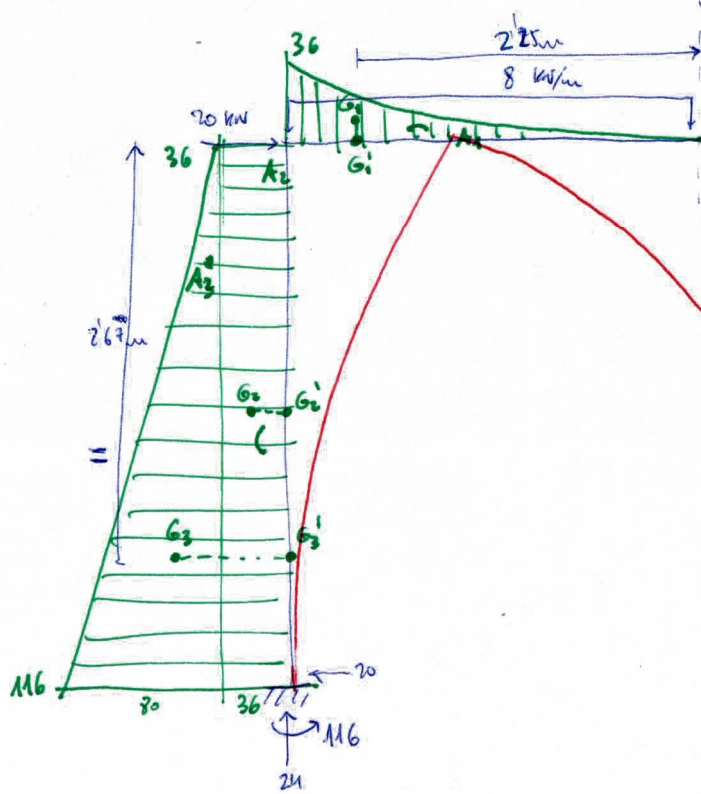


Descomposición (2)



Momentos 1+1 = (2) (1)



Areas (1)

Area	Coord. \bar{x}	\bar{y}	φ (Kpm)
$A_1 = \frac{1}{3} \cdot 3 \cdot 36 = 36$	\bar{x}	\bar{y}	φ
$A_2 = 4 \cdot 36 = 144$	+	-	-
$A_3 = \frac{1}{2} \cdot 4 \cdot 80 = 160$	+	-	=

Centroids (1)

(2)

$A_1 = \frac{1}{2} \cdot 3 \cdot 3R_B = 4.5 R_B = 99.3$	\bar{x}	+	+
$A_2 = 4 \cdot 3R_B = 12 R_B = 264.8$	-	+	+

$$|S_{x1}| = \frac{1}{EI} (36 \cdot 2.25 + 144 \cdot 3 + 160 \cdot 3) = 0.0993$$

$$|S_{x2}| = \frac{1}{EI} (4.5 R_B \cdot 2 + 12 R_B \cdot 3) = 4.5 \cdot 10 \cdot 3 \cdot R_B$$

Compatibilidad γ R_B (1)

$\Rightarrow R_B = 22.07 \text{ kN}$

$$\varphi_{A1} = \frac{1}{EI} (36 + 144 + 160) = 0.034 \text{ rad } \curvearrowright$$

$$S_{xA1} = \frac{1}{EI} (144 \cdot 2 + 160 \cdot 2.67) = 0.0714 \text{ m} \rightarrow$$

$$\varphi_{B1} = \frac{1}{EI} (144 + 160) = 0.0304 \text{ rad } \curvearrowright$$

$$S_{xB1} = \frac{1}{EI} (144 \cdot 2 + 160 \cdot 2.67) = 0.072 \text{ m} \rightarrow$$

$$S_{yB1} = 0$$

(1)

$$\varphi_{A2} = \frac{1}{EI} (99.3 + 264.8) = 0.0364$$

$$S_{xA2} = \frac{1}{EI} (264.8 \cdot 2) = 0.0530 \text{ m} \leftarrow$$

$$S_{yA} = 0$$

(2)

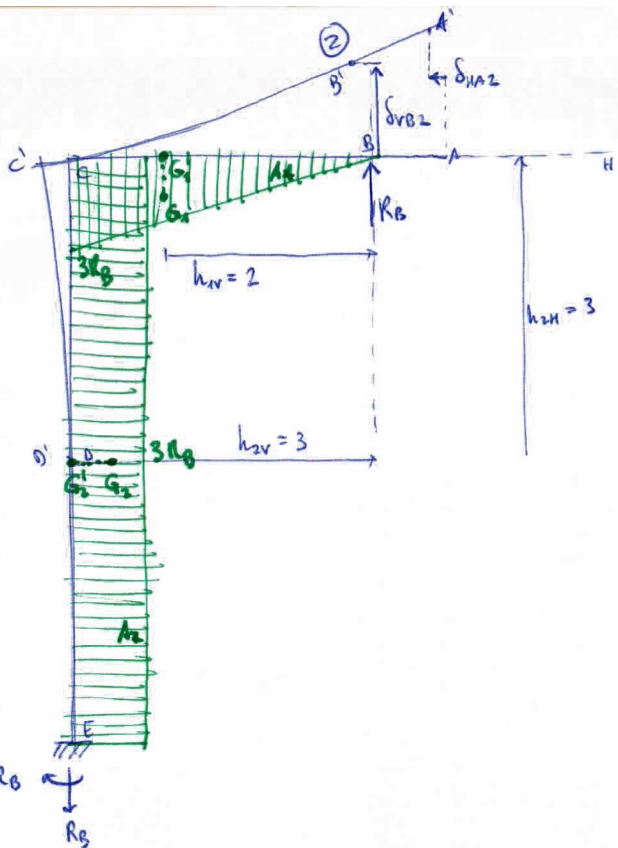
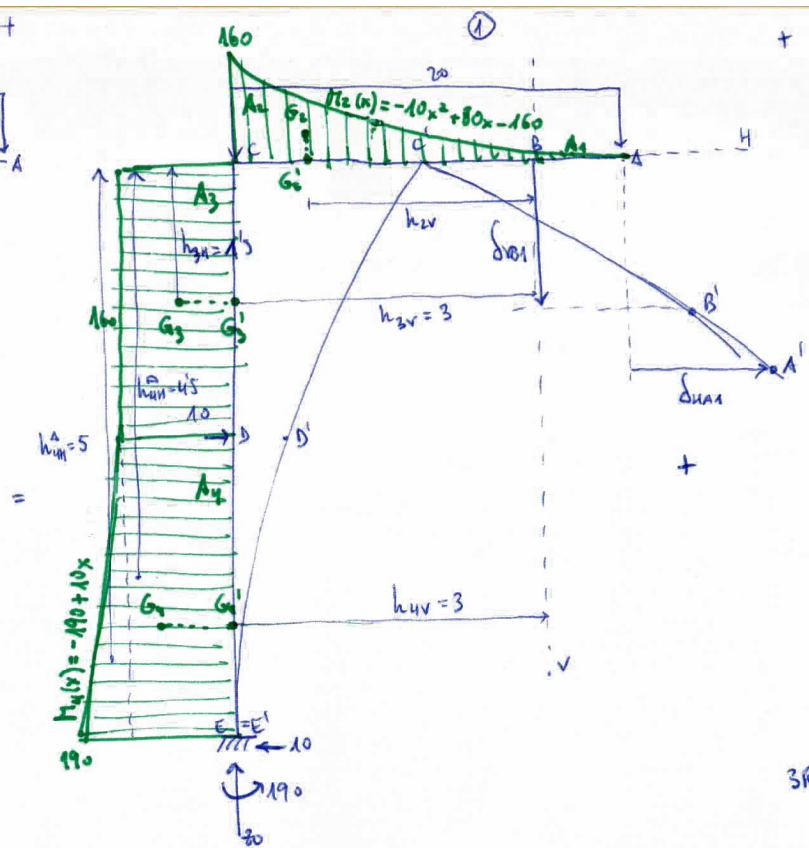
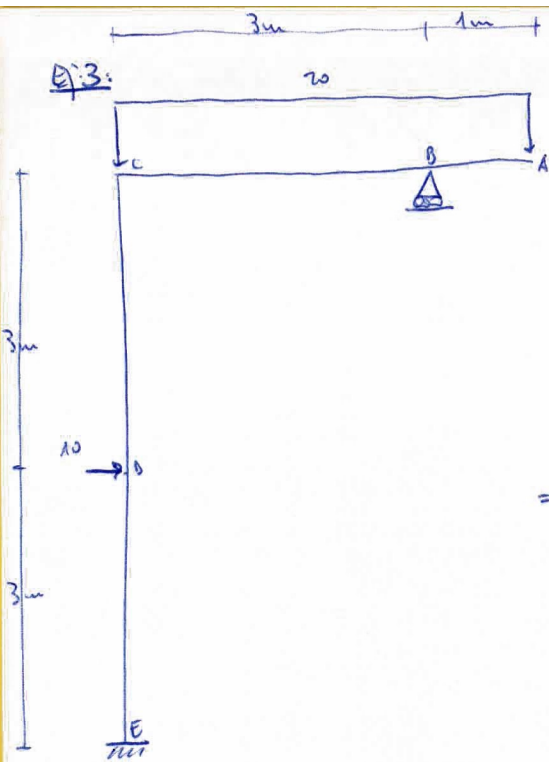
$$\varphi_{B2} = \frac{1}{EI} (264.8) = 0.0265 \text{ rad } \curvearrowright$$

$$S_{xB2} = \frac{1}{EI} (264.8 \cdot 2) = 0.053 \text{ m} \leftarrow$$

$$S_{yB2} = 0$$

(3)

$$\begin{cases} \varphi_C = 0 \\ S_{xC} = 0 \\ S_{yC} = 0 \end{cases}$$



$$\delta_{HA} = \delta_{HA1} - \delta_{HA2} = 0.311 - 0.295 = \boxed{0.016 \text{ m}}$$

$$M_2(x) = -160 + 80x - 20 \frac{x^2}{2} = -10x^2 + 80x - 160$$

$$\begin{aligned} \delta_{VB1} &= \frac{1}{EI} (A_4 \cdot h_{4V} + A_3 \cdot h_{3V} + A_2 \cdot h_{2V}) = \\ &= \frac{1}{EI} (3 \cdot 175 \cdot 3 + 3 \cdot 160 \cdot 3 + \int_0^3 M_2(x)(3-x) dx) = \\ &= 10^{-4} \left(3015 + \left[\frac{10x^4}{4} - 110 \frac{x^3}{3} + 400 \frac{x^2}{2} - 480x \right]_0^3 \right) = \frac{3015 + 4275}{10^4} = 0.344 \text{ m} \downarrow \end{aligned}$$

$$\begin{aligned} \delta_{HA1} &= \frac{1}{EI} (A_4 \cdot h_{4H} + A_3 \cdot h_{3H} + A_2 \cdot 0 + A_1 \cdot 0) = \\ &= 10^{-4} (3 \cdot 160 \cdot 4.5 + \frac{1}{2} \cdot 3 \cdot 30 \cdot 5 + 3 \cdot 160 \cdot 1.5) = 0.311 \text{ m} \rightarrow \end{aligned}$$

$$|\delta_{VB2}| = |\delta_{VB1}| \Rightarrow \delta_{VB2} = 0.344 = \frac{1}{EI} (A_2 h_{2V} + A_1 h_{1V}) \Rightarrow$$

$$\Rightarrow 0.344 \cdot 10^4 = 6 \cdot 3R_B \cdot 3 + \frac{1}{2} \cdot 3 \cdot 3R_B \cdot 2 \Rightarrow 3440 = 63R_B \Rightarrow \boxed{R_B = 54.6 \text{ kN}}$$

$$\delta_{HA2} = \frac{1}{EI} \cdot A_2 \cdot h_{2H} = \frac{6 \cdot 54.6 \cdot 3}{10^4} = 0.295 \text{ m} \leftarrow$$

$$M_2(x)(3-x) = (-10x^2 + 80x - 160)(3-x) = -30x^2 + 240x - 480 + 10x^3 - 80x^2 + 160x = 10x^3 - 110x^2 + 400x - 480$$