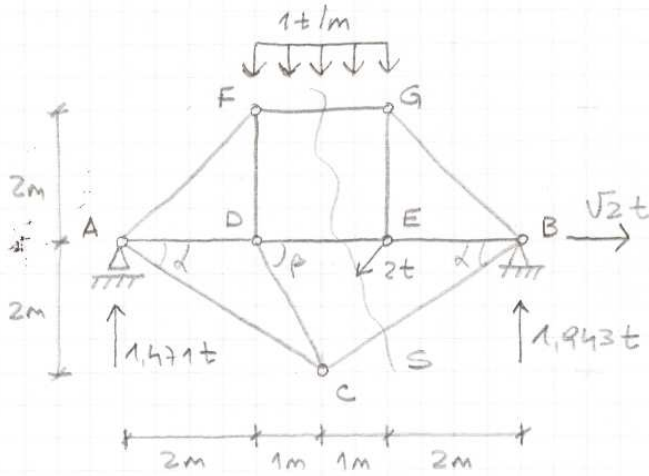


Ejercicio 1

1/2



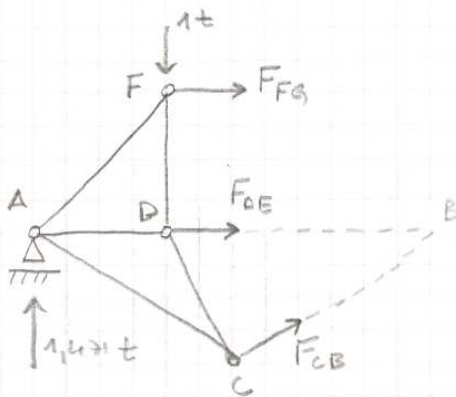
$$\tan \alpha = \frac{4}{6} \Rightarrow \alpha = \text{Arctg}\left(\frac{2}{3}\right) = 33,7^\circ$$

$$\tan \beta = \frac{4}{2} \Rightarrow \beta = \text{Arctg}(2) = 63,4^\circ$$

$$6R_A = 12 \cdot 3 + \sqrt{2} \cdot 2$$

$$\Rightarrow R_A = \frac{6 + 2\sqrt{2}}{6} = 1,471t$$

$$\Rightarrow R_B = 2 + \sqrt{2} \cdot 1,471 = 1,943t$$



Sección Canónica S

$$M_B = 0$$

$$F_{FG} \cdot 2 + 1,471 \cdot 6 = 1 \cdot 4$$

$$\Rightarrow F_{FG} = -2,414t$$

Equilibrio Vertical

$$1,471 + F_{CB} \sin \alpha = 1$$

$$\Rightarrow F_{CB} = -0,850t$$

Equilibrio Horizontal

$$-2,414 + F_{DE} - 0,850 \cos \alpha = 0$$

$$\Rightarrow F_{DE} = 3,121t$$

$$\text{Eq NUDO } \textcircled{F} \Rightarrow F_{AF} \frac{\sqrt{2}}{2} = -2,414 \Rightarrow F_{AF} = -3,414t$$

$$\Rightarrow F_{DF} + 1 - 3,414 \frac{\sqrt{2}}{2} = 0 \Rightarrow F_{DF} = +1,414t$$

$$\text{Simetría en NUDO } \textcircled{G} \Rightarrow F_{EG} = +1,414t \quad F_{BG} = -3,414t$$

$$\text{Eq NUDO } \textcircled{A} \Rightarrow F_{AF} \frac{\sqrt{2}}{2} - F_{AC} \sin \alpha + 1,471 = 0 \Rightarrow F_{AC} = -1,700t$$

$$\Rightarrow F_{AD} + F_{AF} \frac{\sqrt{2}}{2} + F_{AC} \cos \alpha = 0 \Rightarrow F_{AD} = +3,828t$$

$$\text{Eq NUDO } \textcircled{E} \Rightarrow F_{EB} = F_{DE} + 2 \frac{\sqrt{2}}{2} \Rightarrow F_{EB} = 4,535t$$

$$\text{Eq NUDO } \textcircled{C} \Rightarrow F_{DC} \sin \beta = F_{DF} \Rightarrow F_{DC} = +1,581t$$

$$\Delta l = \frac{FL}{E\Omega}$$

$$E = 2100 \text{ t/cm}^2$$

$$\Omega = \frac{\pi \cdot 25^2}{4} = 4,91 \text{ cm}^2$$

$$W = \frac{\pi D^3}{32} = \frac{\pi \cdot 25^3}{32} = 1,53 \text{ cm}^3$$

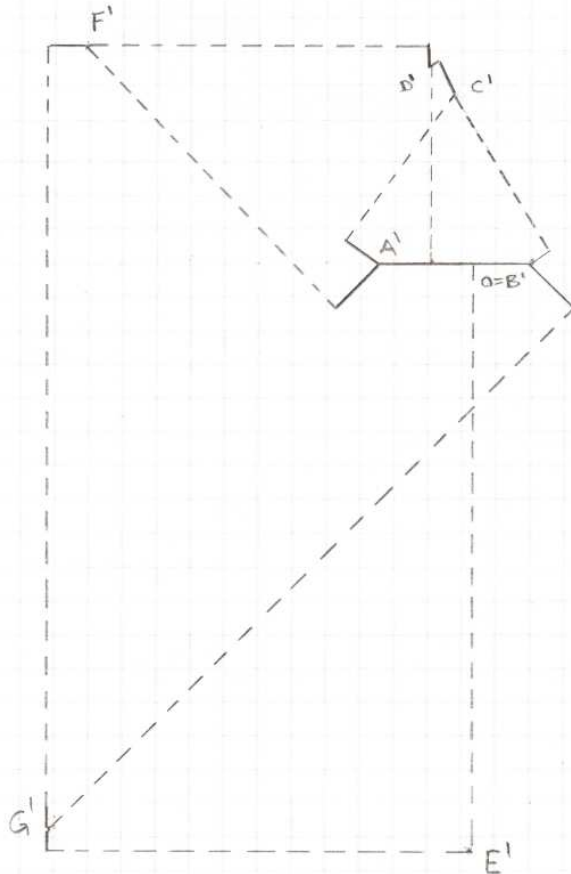
$$\sigma_{máx} = \frac{-2414}{4,91} - \frac{50000}{1,53} = -33,1 \frac{\text{t}}{\text{cm}^2}$$

$$\sigma_{mín} = \frac{4536}{4,91} = 0,9 \frac{\text{t}}{\text{cm}^2}$$

BARRA	F(t)	L(cm)	Ω (cm ²)	ΔL (mm)
AC	-1,700	361	4,91	-0,59
DC	+1,581	224	4,91	+0,34
BC	-0,850	361	4,91	-0,30
AD	+3,828	200	4,91	+0,74
DE	+3,121	200	4,91	+0,61
EB	+4,536	200	4,91	+0,88
AF	-3,414	283	4,91	-0,94
DF	+1,414	200	4,91	+0,27
EG	+1,414	200	4,91	+0,27
BG	-3,414	283	4,91	-0,94
FG	-2,414	200	4,91	-0,47

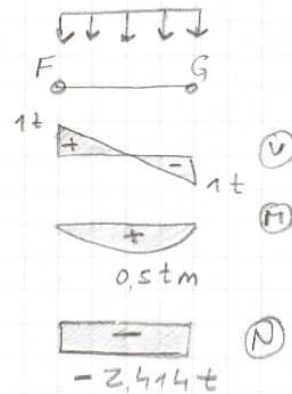
Tensión INADMISIBLE para el ACERO

Diagrama de WILLIOT



NUDO	Δx (mm)	Δy (mm)
A	-2,22	0
B	0	0
C	-1,29	+2,47
D	-1,49	+2,75
E	-0,88	-8,65
F	-6,58	+3,02
G	-7,05	-8,38

- B punto fijo
- Primero se halla el A', desplazamiento horizontal y suma de los alargamientos de las barras AD, DE y EB
- Con A' y B' se halla C'
- Con A' y C' se halla D'
- Con A' y D' se halla F'
- Con F' y B' se halla G'
- Con G' y B' se halla E'



$$M = \frac{1 \cdot 2^2}{8} = \frac{1}{2}$$

El resto de las barras trabajan solo a directa.