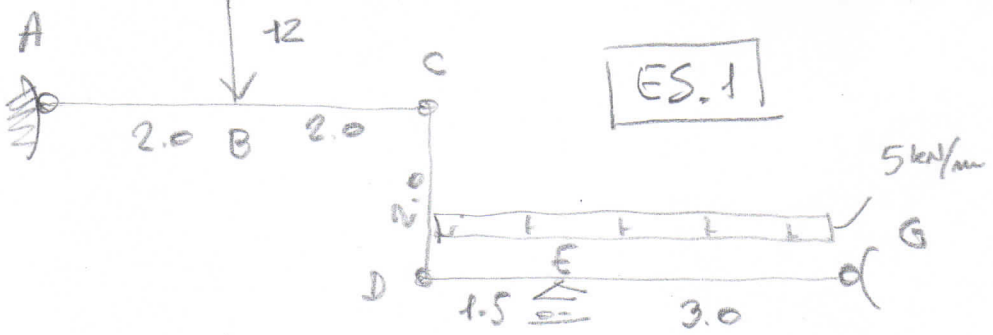
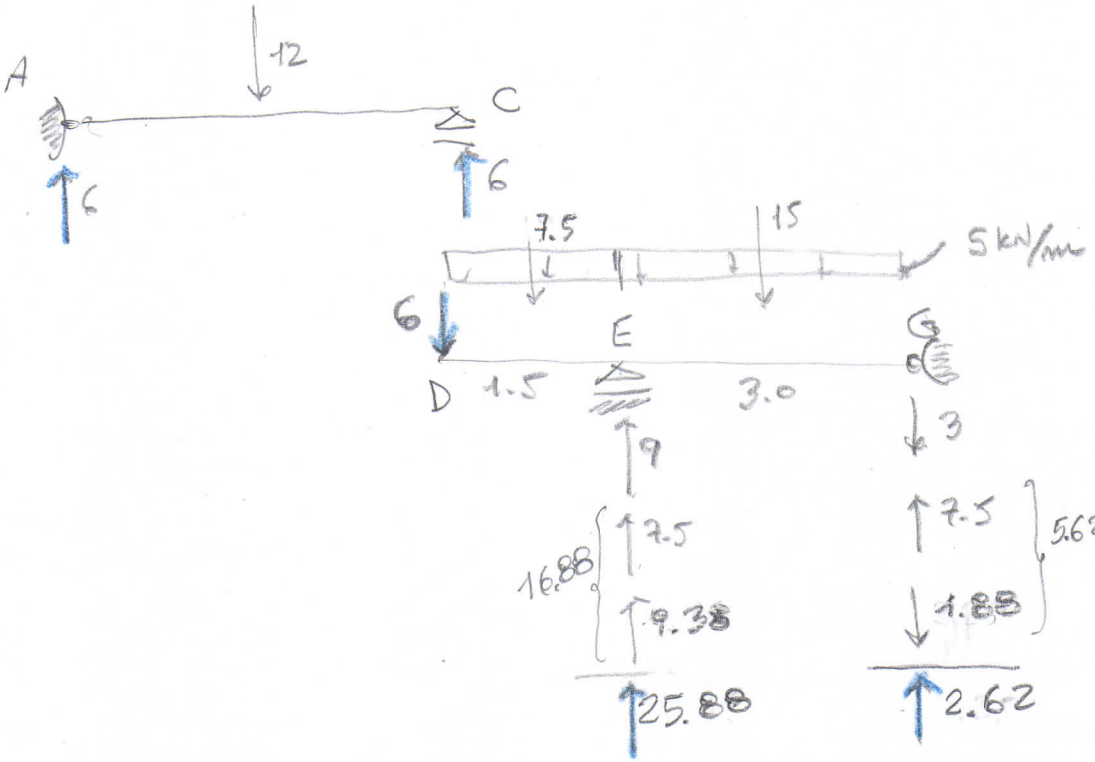
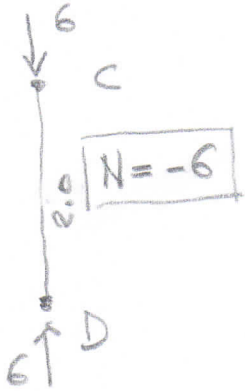
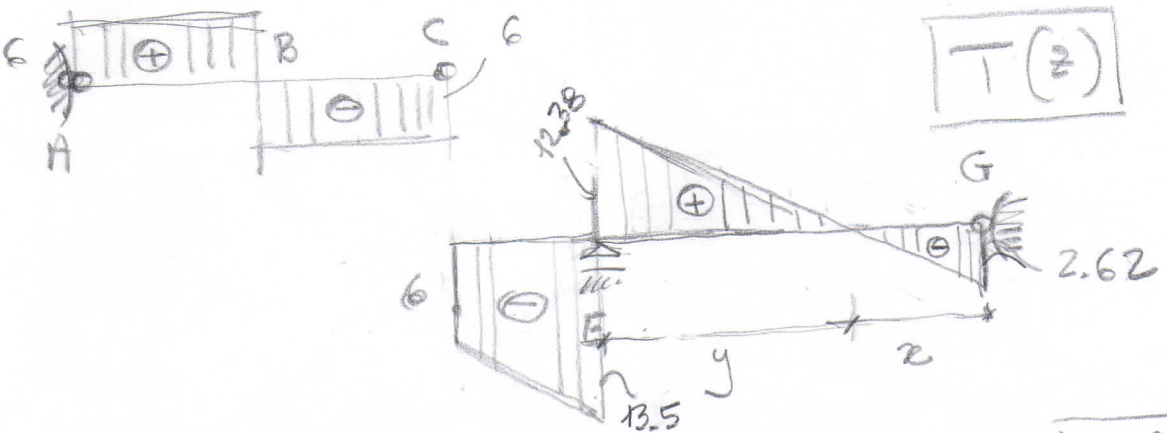
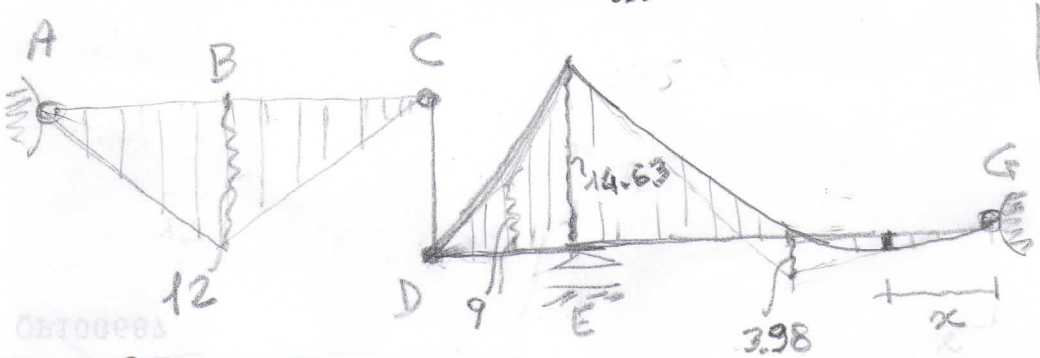
ES. 1











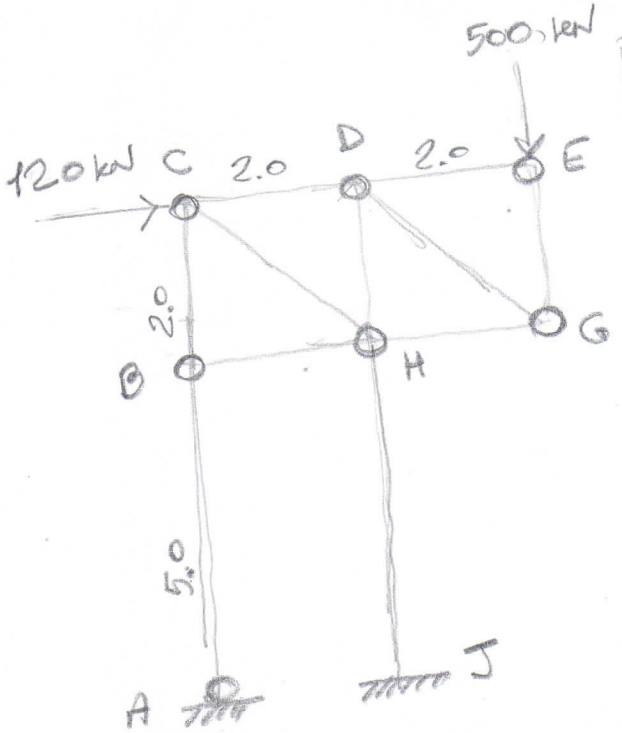
$$\frac{x}{2.62} = \frac{3}{2.62+12.38} \Rightarrow x = 0.52\,m$$

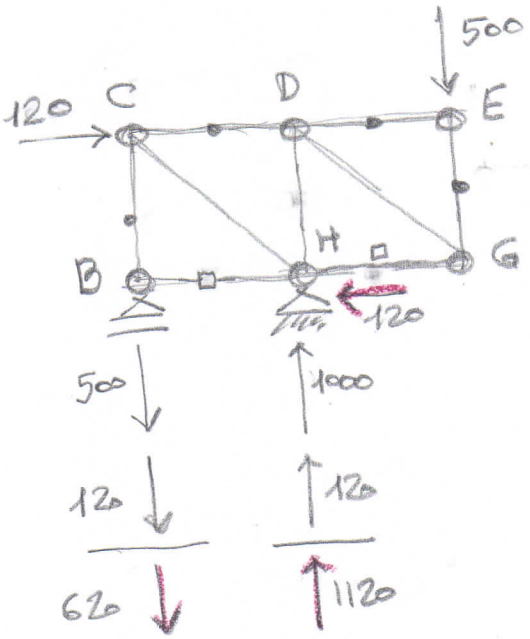
$$y = 2.48\,m$$

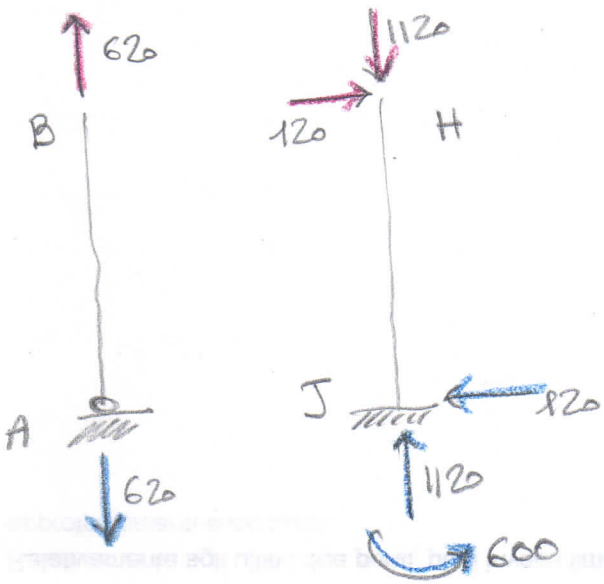
oppure $2.62 = 5 \cdot x \Rightarrow x = 0.52\,m$

$$M_{max} = 2.62 \times \frac{0.52}{2} = 0.68\ kNm$$

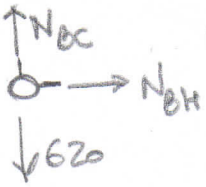
ES. 2





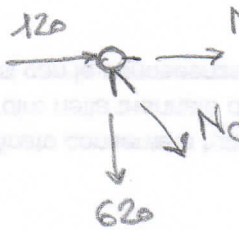


1) Nodo B



- $N_{BH} = 0$
- $N_{BC} = 620$

2) Nodo C



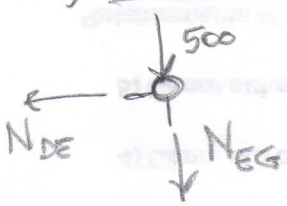
$$120 + N_{CD} + N_{CH}\frac{\sqrt{2}}{2} = 0$$

$$620 + N_{CH}\frac{\sqrt{2}}{2} = 0$$

$$N_{CH} = -\frac{1240}{\sqrt{2}} = -620\sqrt{2} = -877$$

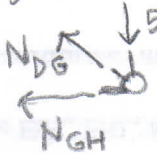
- $N_{CD} = -120 + 620 = 500$

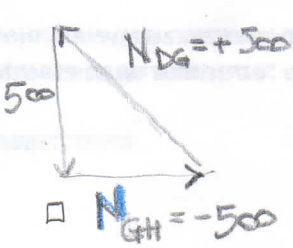
3) Nodo E

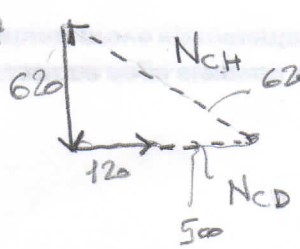


- $N_{DE} = 0$
- $N_{EG} = -500$

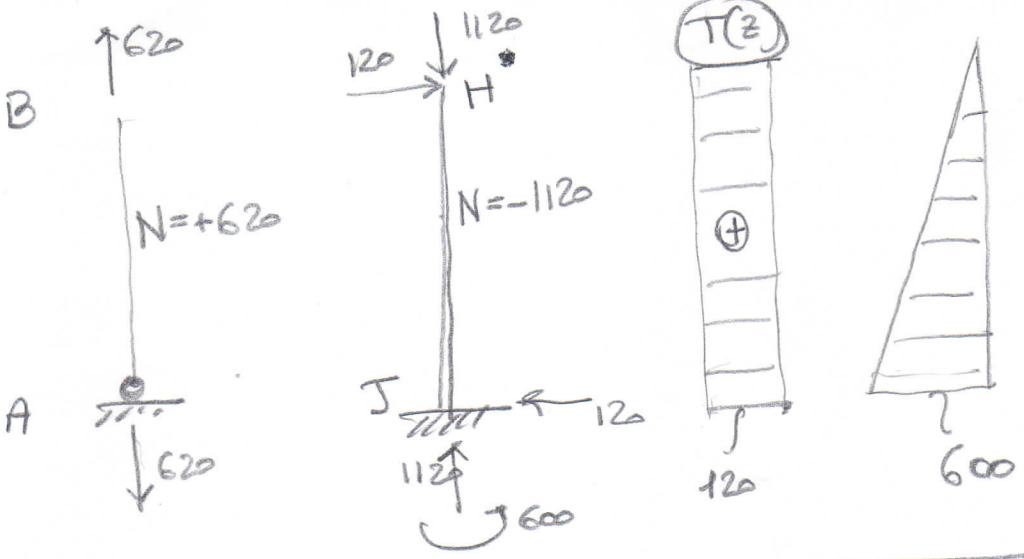
4) Nodo G



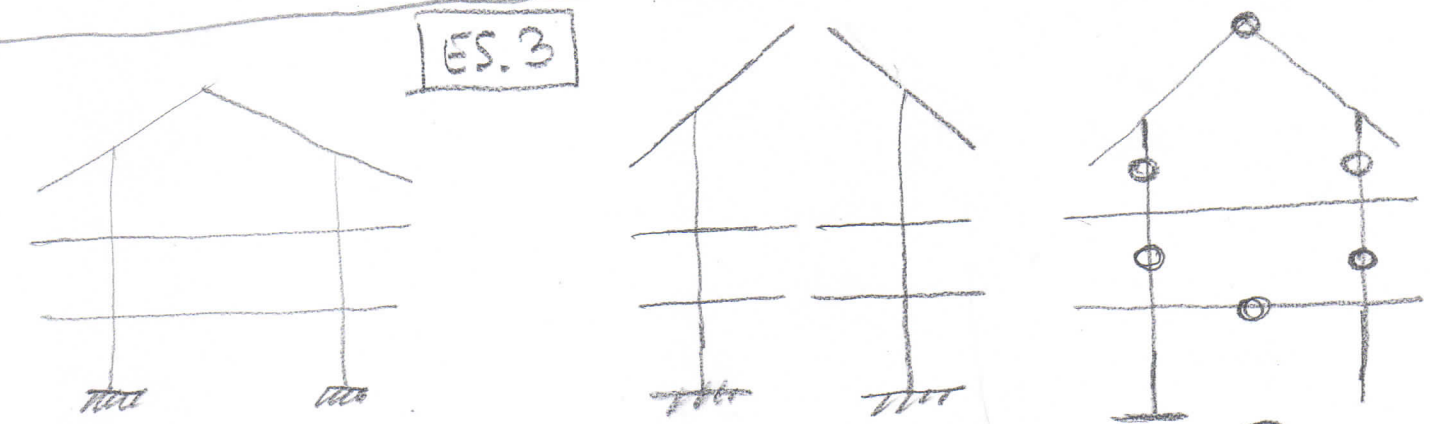




N	CD	BC	EG	DE	BH	GH
	500	620	-500	0	0	-500



ES.3

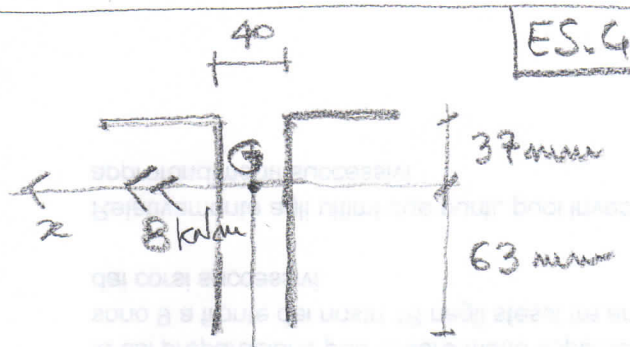


3 i.p. est. + 6 i.p. int.

15.

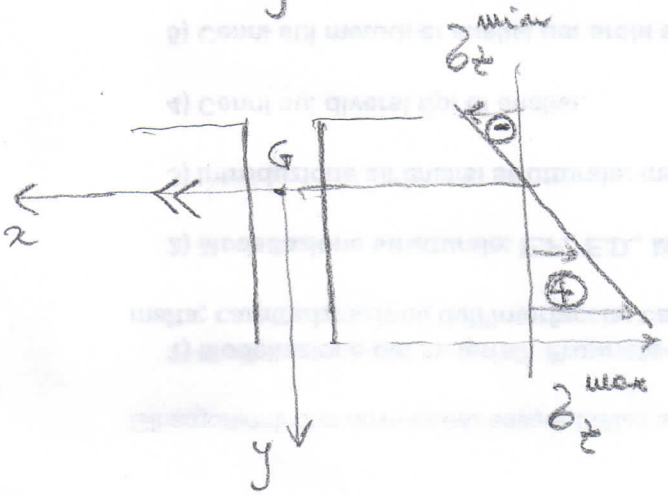
15

ES.4



$$I_z^{tot} = 2 \cdot I_z^{L} = 282 \text{ cm}^4$$

$$I_y^{tot} = 2\left[23.4 + 14.1 \times (1.2+2)^2\right] = 336 \text{ cm}^4$$



$$\sigma_z^{max} = \frac{8 \times 10^6}{282 \times 10^4} \times 63 = 179 \frac{N}{mm^2}$$

$$\sigma_z^{min} = \frac{8 \times 10^6}{282 \times 10^4} \times (-37) = -105 \frac{N}{mm^2}$$