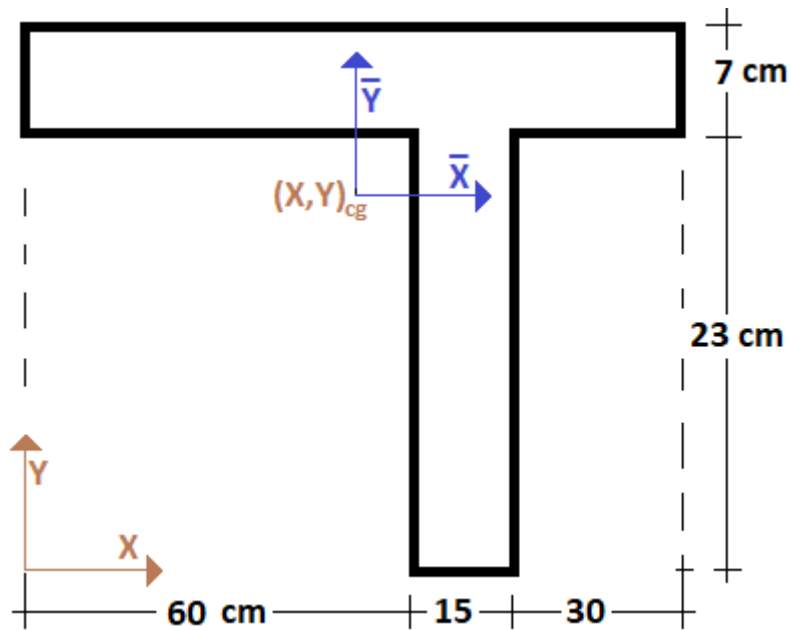
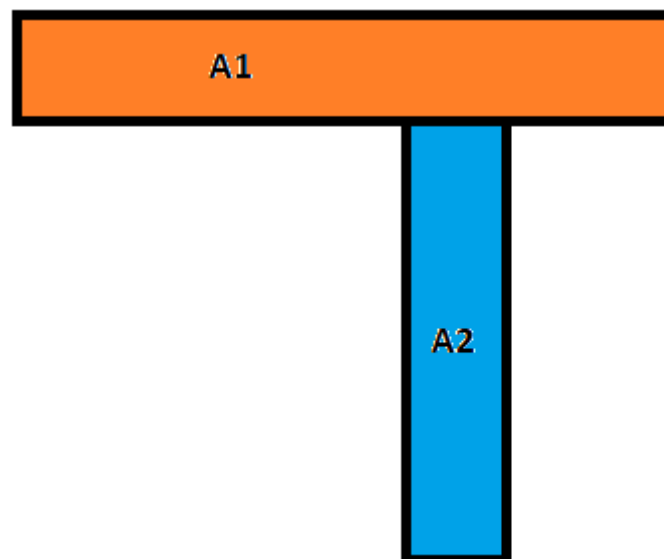


Inercia de la sección en Te no simétrica



#1: [CaseMode := Sensitive, InputMode := Word]

División en figuras geométricas conocidas:



Áreas, en cm²:

#2: [A1 := 7 · (60 + 15 + 30), A2 := 15 · 23]

#3: [A1 := 735, A2 := 345]

Centroides de cada área, en cm:

$$\#4: \begin{bmatrix} X_{cg1} := \frac{60 + 15 + 30}{2} & Y_{cg1} := 23 + \frac{7}{2} \\ X_{cg2} := 60 + \frac{15}{2} & Y_{cg2} := \frac{23}{2} \end{bmatrix}$$

$$\#5: \begin{bmatrix} X_{cg1} := 52.5 & Y_{cg1} := 26.5 \\ X_{cg2} := 67.5 & Y_{cg2} := 11.5 \end{bmatrix}$$

$$\#6: \begin{bmatrix} X_{cg1} := \frac{105}{2} & Y_{cg1} := \frac{53}{2} \\ X_{cg2} := \frac{135}{2} & Y_{cg2} := \frac{23}{2} \end{bmatrix}$$

Centroide de toda la figura, en cm:

$$\#7: \left[X_{cgf} := \frac{A1 \cdot X_{cg1} + A2 \cdot X_{cg2}}{A1 + A2}, Y_{cgf} := \frac{A1 \cdot Y_{cg1} + A2 \cdot Y_{cg2}}{A1 + A2} \right]$$

$$\#8: [X_{cgf} := 57.29166666, Y_{cgf} := 21.70833333]$$

$$\#9: \left[X_{cgf} := \frac{1375}{24}, Y_{cgf} := \frac{521}{24} \right]$$

Inercias centroidales de cada área, en cm⁴:

$$\#10: \begin{bmatrix} I_{xcg1} := \frac{1}{12} \cdot (60 + 15 + 30) \cdot 7^3 & I_{ycg1} := \frac{1}{12} \cdot (60 + 15 + 30) \cdot 7^3 \\ I_{xcg2} := \frac{1}{12} \cdot 15 \cdot 23^3 & I_{ycg2} := \frac{1}{12} \cdot 15 \cdot 23^3 \end{bmatrix}$$

$$\#11: \begin{bmatrix} I_{xcg1} := 3001.25 & I_{ycg1} := 6.7528125 \cdot 10^5 \\ I_{xcg2} := 1.520875 \cdot 10^4 & I_{ycg2} := 6468.75 \end{bmatrix}$$

$$\#12: \begin{bmatrix} I_{xcg1} := \frac{12005}{4} & I_{ycg1} := \frac{2701125}{4} \\ I_{xcg2} := \frac{60835}{4} & I_{ycg2} := \frac{25875}{4} \end{bmatrix}$$

Inercias de cada área respecto a los ejes centroidales de toda la figura, en cm⁴:

$$\#13: \begin{bmatrix} I_{xcgf1} := I_{xcg1} + A1 \cdot (Y_{cg1} - Y_{cgf})^2 & I_{ycgf1} := I_{ycg1} + A1 \cdot (X_{cg1} - X_{cgf})^2 \\ I_{xcgf2} := I_{xcg2} + A2 \cdot (Y_{cg2} - Y_{cgf})^2 & I_{ycgf2} := I_{ycg2} + A2 \cdot (X_{cg2} - X_{cgf})^2 \end{bmatrix}$$

$$\#14: \begin{bmatrix} I_{xcgf1} := 1.987690104 \cdot 10^4 & I_{ycgf1} := 6.92156901 \cdot 10^5 \\ I_{xcgf2} := 5.116122395 \cdot 10^4 & I_{ycgf2} := 4.242122395 \cdot 10^4 \end{bmatrix}$$

$$\#15: \begin{bmatrix} I_{xcgf1} := \frac{3816365}{192} & I_{ycgf1} := \frac{132894125}{192} \\ I_{xcgf2} := \frac{9822955}{192} & I_{ycgf2} := \frac{8144875}{192} \end{bmatrix}$$

Inercias respecto a los ejes centroidales de toda la figura, en cm⁴:

$$\#16: \begin{bmatrix} I_{xcgf} = I_{xcgf1} + I_{xcgf2} \\ I_{ycgf} = I_{ycgf1} + I_{ycgf2} \end{bmatrix}$$

$$\#17: \begin{bmatrix} I_{xcgf} = 7.1038125 \cdot 10^4 \\ I_{ycgf} = 7.34578125 \cdot 10^5 \end{bmatrix}$$

$$\#18: \begin{bmatrix} I_{xcgf} = \frac{568305}{8} \\ I_{ycgf} = \frac{5876625}{8} \end{bmatrix}$$

Usando una tabla de cálculo:

#	Lx (cm)	Ly (cm)	A (cm ²)	Xcg (cm)	Ycg (cm)	A*Xcg (cm ³)	A*Ycg (cm ³)	Ix cg (cm ⁴)	Iy cg (cm ⁴)	Ix cg toda (cm ⁴)	Iy cg toda (cm ⁴)
1	105.00	7.00	735.00	52.50	26.50	38 587.50	19 477.50	3 001.25	675 281.25	19 876.90	692 156.90
2	15.00	23.00	345.00	67.50	11.50	23 287.50	3 967.50	15 208.75	6 468.75	51 161.22	42 421.22
Toda			1 080.00	57.29	21.71	61 875.00	23 445.00			71 038.13	734 578.13