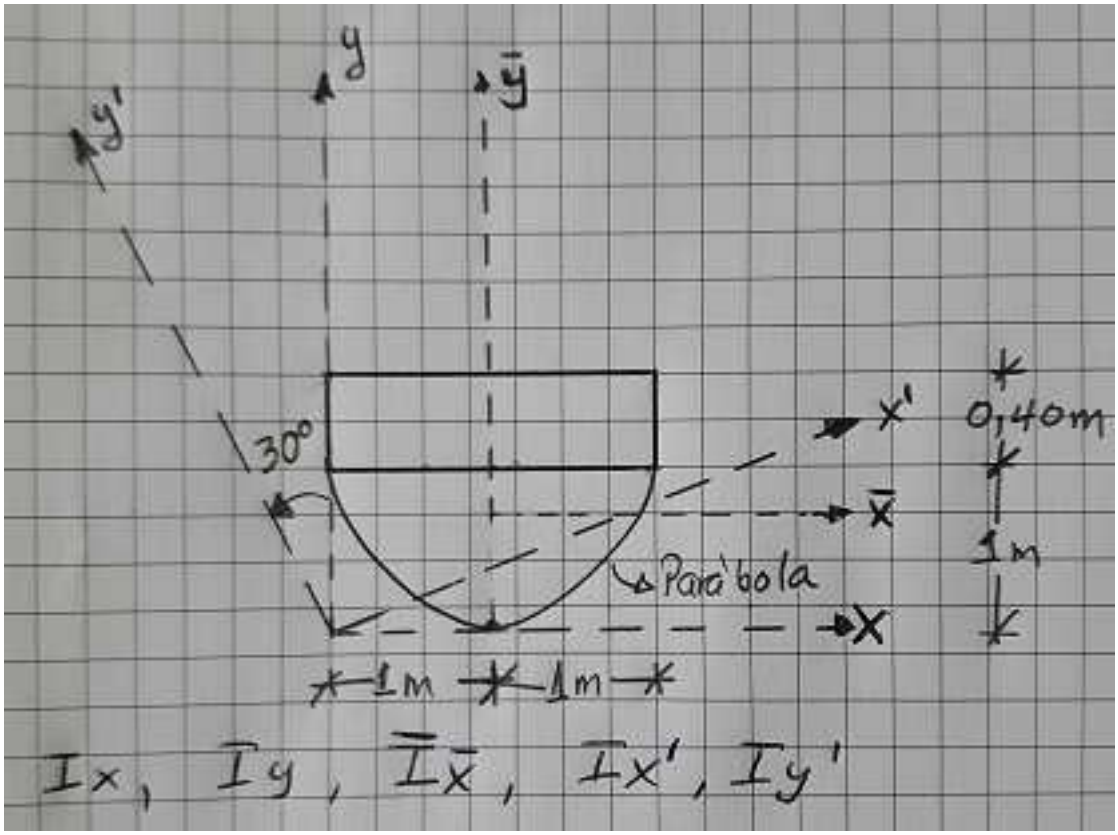


#1: CaseMode := Sensitive

#2: InputMode := Word

Rectángulo es el área 1 y parábola es el área 2

Área 1:

#3: A1 := 2·0.4

#4: A1 := 0.8

Coordenadas del centro geométrico del área 1:

#5: [Xcg1 := 1, Ycg1 := 1.2]

Inercia centroidal del área 1:

#6: $\left[Ixb1 := \frac{1}{12}\cdot 2\cdot 0.4^3,\ Iyb1 := \frac{1}{12}\cdot 0.4\cdot 2^3\right]$

#7: $\left[Ixb1 := \frac{4}{375},\ Iyb1 := \frac{4}{15}\right]$

#8: [Ixb1 := 0.01066666666, Iyb1 := 0.2666666666]

Inercia del área 1 alrededor del eje x:

#9:
$$\begin{bmatrix} Ix1 := Ixb1 + A1 \cdot Ycg1^2 \\ Iy1 := Iyb1 + A1 \cdot Xcg1^2 \end{bmatrix}$$

#10:
$$\begin{bmatrix} Ix1 := \frac{436}{375} \\ Iy1 := \frac{16}{15} \end{bmatrix}$$

#11:
$$\begin{bmatrix} Ix1 := 1.162666666 \\ Iy1 := 1.066666666 \end{bmatrix}$$

Área 2:

Ecuación de la parábola:

#12: [A :=, B :=, C :=, y2(x) :=]

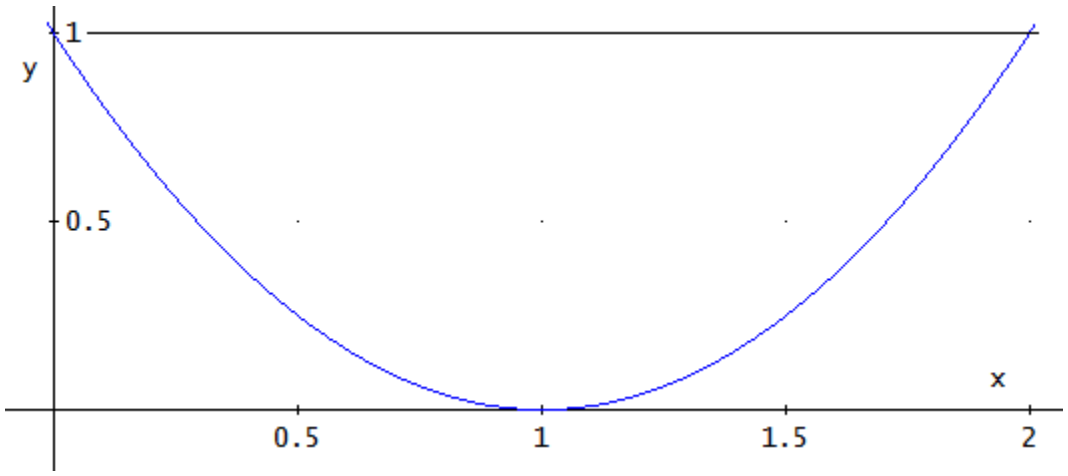
#13:
$$\begin{bmatrix} y2(x) := A \cdot x^2 + B \cdot x + C \end{bmatrix}$$

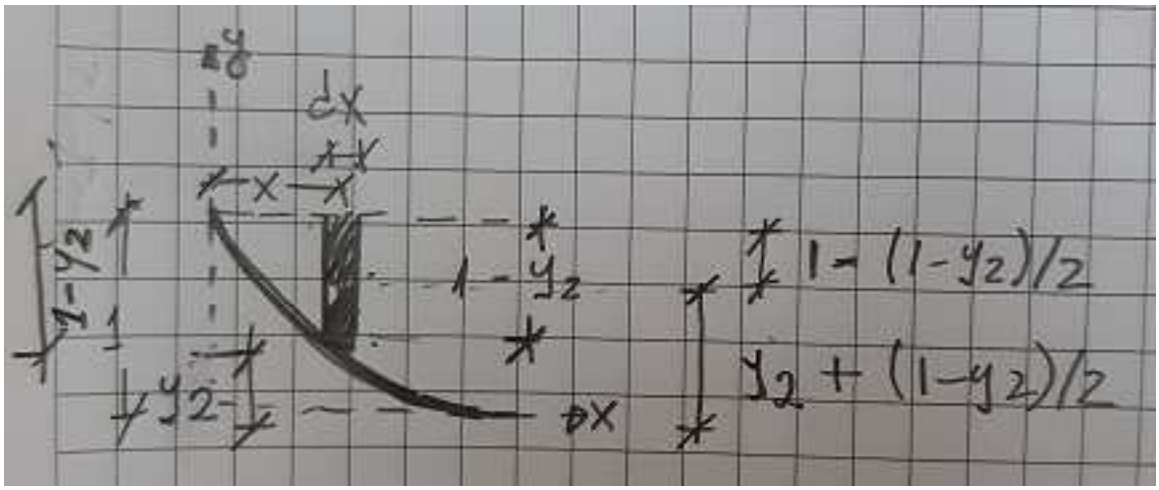
#14:
$$\begin{bmatrix} 1 = A \cdot 0^2 + B \cdot 0 + C \\ 0 = A \cdot 1^2 + B \cdot 1 + C \\ 1 = A \cdot 2^2 + B \cdot 2 + C \end{bmatrix}$$

#15: [A := 1, B := −2, C := 1]

#16:
$$\begin{bmatrix} y2(x) := x^2 - 2 \cdot x + 1 \end{bmatrix}$$

#17:
$$\begin{bmatrix} y2(x) := (x - 1)^2 \end{bmatrix}$$





#18: $A2 := \int_0^2 (1 - y2(x))\, dx$

#19: $A2 := \frac{4}{3}$

#20: $A2 := 1.333333333$

#21: $\left[Xcg2 := 1,\ Ycg2 := \frac{\int_0^2 \left(y2(x) + \frac{1 - y2(x)}{2} \right) \cdot (1 - y2(x))\, dx}{A2} \right]$

#22: $[Xcg2 := 1,\ Ycg2 := 0.6]$

Inercia del área 2 alrededor del eje x:

#23: $Ix2 := \int_0^2 \int_{y2(x)}^1 y^2 \, dy \, dx$

#24: $$Ix2 := \int_0^2 -\frac{x\cdot(x^5 - 6\cdot x^4 + 15\cdot x^3 - 20\cdot x^2 + 15\cdot x - 6)}{3} \, dx$$

#25: $$Ix2 := \frac{4}{7}$$

Tambien puede calcularse usando teorema de Ejes Paralelos (Steiner) con la inercia centroidal del área rectangular diferencial, así:

#26: $$Ix2 := \int_0^2 \frac{1}{12}\cdot(1 - y2(x))^3 \, dx + \int_0^2 \left(y2(x) + \frac{1 - y2(x)}{2}\right)^2 \cdot(1 - y2(x)) \, dx$$

#27: $$Ix2 := \frac{4}{7}$$

#28: $$Ix2 := 0.5714285714$$

Inercia del área 2 alrededor de su eje centroidal horizontal:

#29: $Ixb2 := Ix2 - Ycg2^2 \cdot A2$

#30: $$Ixb2 := \frac{4}{7} - 0.6^2 \cdot \frac{4}{3}$$

#31: $$Ixb2 := \frac{16}{175}$$

#32: $$Ixb2 := 0.09142857142$$

Área combinada, centro geométrico combinado e inercia:

#33: $At := A1 + A2$

#34: $$At := \frac{32}{15}$$

#35: $At := 2.133333333$

#36: $\left[Xcg := \frac{Xcg1 \cdot A1 + Xcg2 \cdot A2}{At}, Ycg := \frac{Ycg1 \cdot A1 + Ycg2 \cdot A2}{At}\right]$

#37: $\left[Xcg := 1, Ycg := \frac{33}{40}\right]$

#38: $[Xcg := 1, Ycg := 0.825]$

Inercia del área total alrrededor del eje x:

#39: $Ix := Ix1 + Ix2$

#40: $Ix := \frac{436}{375} + \frac{4}{7}$

#41: $Ix := \frac{4552}{2625}$

#42: $Ix := 1.734095238$

Inercia del área total alrededor del eje centroidal x barra:

#43: $Ixb := Ix - At \cdot Ycg^2$

#44: $Ixb := \frac{4552}{2625} - \frac{32}{15} \cdot \left(\frac{33}{40}\right)^2$

#45: $Ixb := \frac{1481}{5250}$

#46: $Ixb := 0.2820952380$