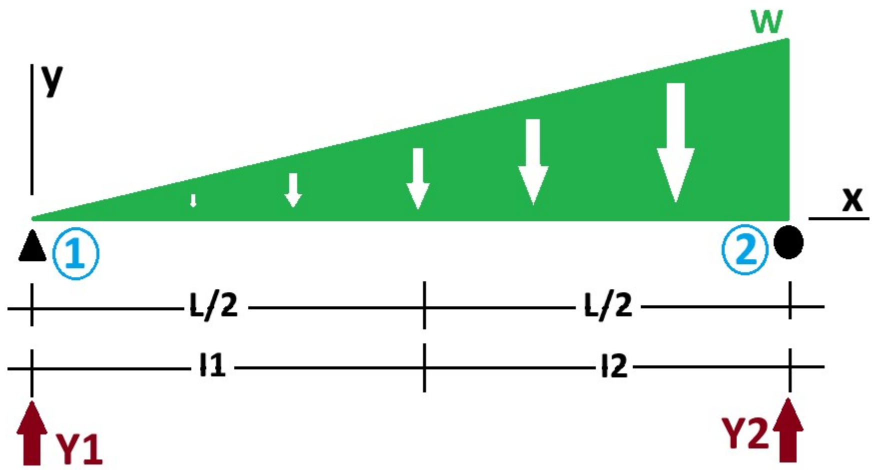


#1: [CaseMode ≔ Sensitive, InputMode ≔ Word]

#2: [Y1 ≔, Y2 ≔, W ≔, L ≔, E ≔, I1 ≔, I2 ≔ 2·I1]

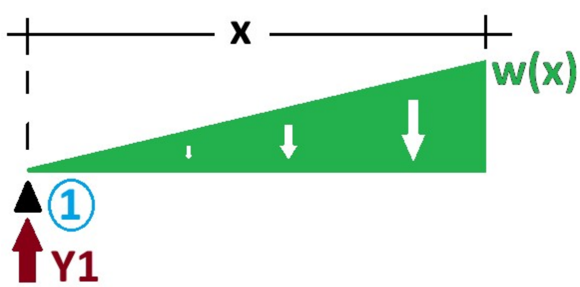
#3: [MF(x) ≔, w(x) ≔, δ1(x) ≔, δ2(x) ≔, δ12 ≔, θ1 ≔, θ12 ≔]

Ecuaciones del equilibrio estático:

#4: $$\left[\begin{array}{c} Y1 + Y2 - \dfrac{W \cdot L}{2} = 0 \\ Y2 \cdot L - \dfrac{W \cdot L}{2} \cdot \dfrac{2}{3} \cdot L = 0 \end{array}\right]$$

#5: $$\left[Y1 := \frac{L \cdot W}{6},\ Y2 := \frac{L \cdot W}{3}\right]$$

Ecuación del diagrama de momento flector:

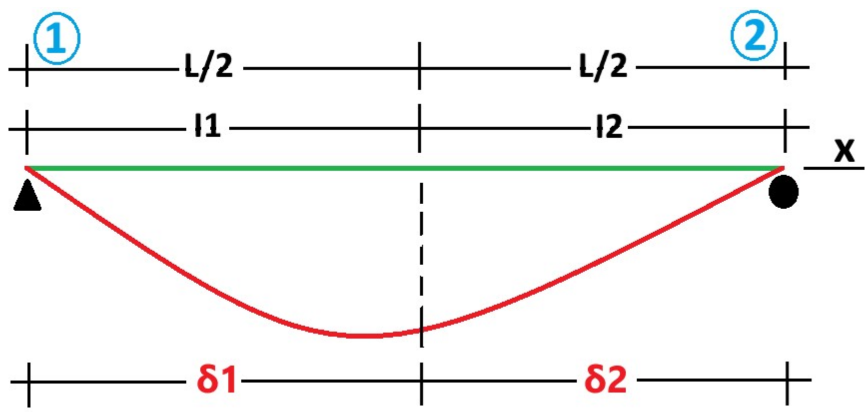


#6: $$w(x) := \frac{W}{L} \cdot x$$

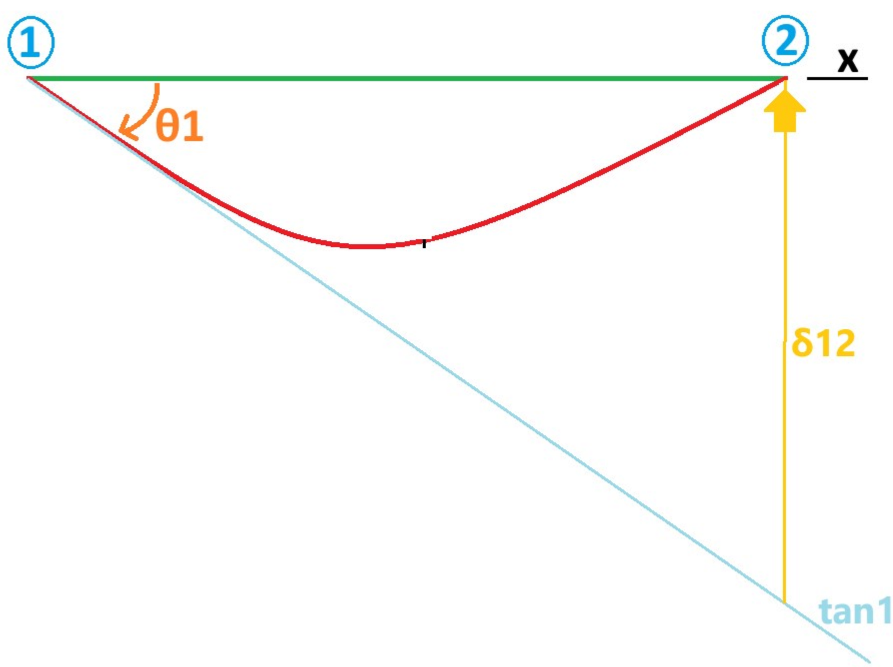
#7: $$MF(x) := Y1 \cdot x - \frac{w(x) \cdot x}{2} \cdot \frac{x}{3}$$

#8: $$MF(x) := \frac{L \cdot W \cdot x}{6} - \frac{W \cdot x^3}{6 \cdot L}$$

Curva elástica estimada (sin escala):



δ12: Distancia entre la tangente en el punto 1 de la curva elástica al punto 2 de la curva elástica:



#9: $$δ12 := \frac{1}{E \cdot I1} \cdot \int_0^{L/2} MF(x) \cdot (L - x)\, dx + \frac{1}{E \cdot I2} \cdot \int_{L/2}^{L} MF(x) \cdot (L - x)\, dx$$

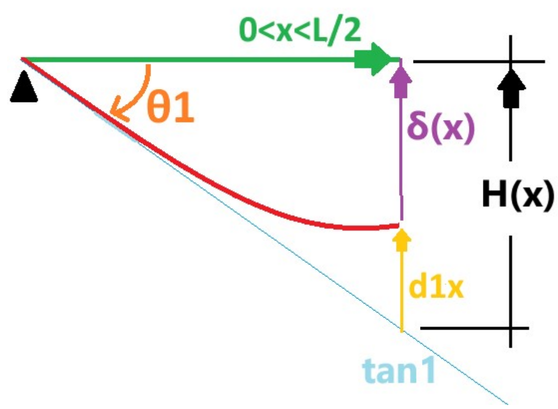
#10: $$\delta 12 := \frac{61 \cdot L^4 \cdot W}{3840 \cdot E \cdot I1}$$

Giro del punto 1 (estamos en el campo de pequeñas deformaciones, donde TAN(θ)=θ):

#11: $$\theta 1 := - \frac{\delta 12}{L}$$

#12: $$\theta 1 := - \frac{61 \cdot L^3 \cdot W}{3840 \cdot E \cdot I1}$$

Deformación por desplazamiento en un punto 0<x<(L/2):



#13: $H(x) := (-\theta 1) \cdot x$

#14: $$H(x) := \frac{61 \cdot L^3 \cdot W \cdot x}{3840 \cdot E \cdot I1}$$

Se usa temporalmente la variable J para referirse a la variable x

#15: $$d1J = \frac{1}{E \cdot I1} \cdot \int_0^J MF(x) \cdot (J - x)\, dx$$

#16: $$d1J = \frac{J^3 \cdot W \cdot (10 \cdot L^2 - 3 \cdot J^2)}{360 \cdot E \cdot I1 \cdot L}$$

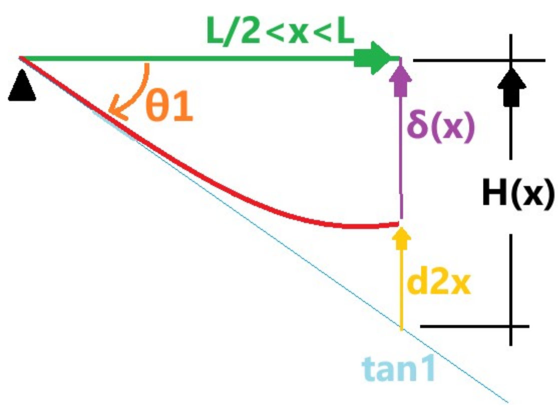
#17: $$\text{SUBST}\left(d1J = \frac{J^3\cdot W\cdot(10\cdot L^2 - 3\cdot J^2)}{360\cdot E\cdot I1\cdot L}, [d1J, J], [d1x, x]\right)$$

#18: $$d1x := \frac{W\cdot x^3\cdot(10\cdot L^2 - 3\cdot x^2)}{360\cdot E\cdot I1\cdot L}$$

#19: $\delta 1(x) := H(x) - d1x$

#20: $$\delta 1(x) := \frac{W\cdot x\cdot(96\cdot x^4 - 320\cdot L^2\cdot x^2 + 183\cdot L^4)}{11520\cdot E\cdot I1\cdot L}$$

Deformación por desplazamiento en un punto (L/2)<x<L:



#21: $$d2J = \frac{1}{E\cdot I1}\cdot\int_0^{L/2} MF(x)\cdot(J - x)\,dx + \frac{1}{E\cdot I2}\cdot\int_{L/2}^{J} MF(x)\cdot(J - x)\,dx$$

#22: $$d2J = -\frac{W\cdot(48\cdot J^5 - 160\cdot J^3\cdot L^2 - 105\cdot J\cdot L^4 + 34\cdot L^5)}{11520\cdot E\cdot I1\cdot L}$$

#23: $$\text{SUBST}\left(d2J = -\frac{W\cdot(48\cdot J^5 - 160\cdot J^3\cdot L^2 - 105\cdot J\cdot L^4 + 34\cdot L^5)}{11520\cdot E\cdot I1\cdot L}, [d2J, J], [d2x, x]\right)$$

#24: $$d2x := -\frac{W\cdot(48\cdot x^5 - 160\cdot L^2\cdot x^3 - 105\cdot L^4\cdot x + 34\cdot L^5)}{11520\cdot E\cdot I1\cdot L}$$

#25: $\delta 2(x) := H(x) - d2x$

#26: $$\delta 2(x) := \frac{W\cdot(24\cdot x^{5} - 80\cdot L^{2}\cdot x^{3} + 39\cdot L^{4}\cdot x + 17\cdot L^{5})}{5760\cdot E\cdot I1\cdot L}$$

Deformación en el centro de la luz:

#27: $$\left[\delta 1\left(\frac{L}{2}\right), \delta 2\left(\frac{L}{2}\right)\right]$$

#28: $$\left[\frac{109\cdot L^{4}\cdot W}{23040\cdot E\cdot I1}, \frac{109\cdot L^{4}\cdot W}{23040\cdot E\cdot I1}\right]$$

#29: $$\left[\frac{0.004730902777\cdot L^{4}\cdot W}{E\cdot I1}, \frac{0.004730902777\cdot L^{4}\cdot W}{E\cdot I1}\right]$$