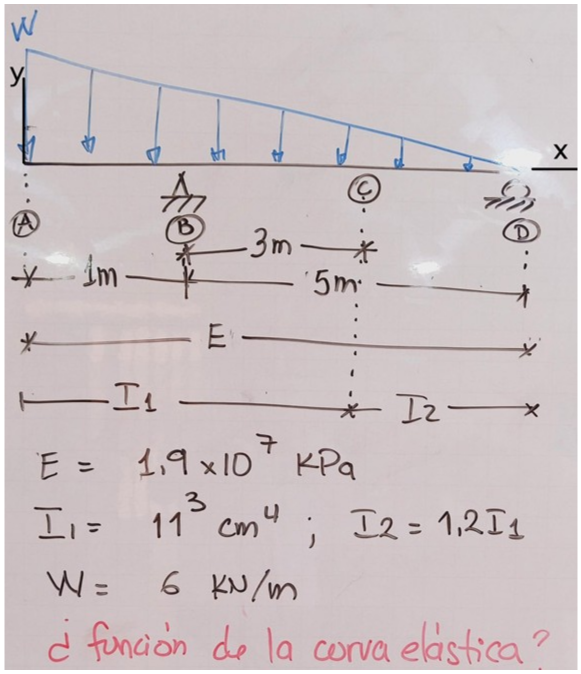


#1: $[\text{CaseMode} \coloneqq \text{Sensitive},\ \text{InputMode} \coloneqq \text{Word}]$

#2: $\left[W \coloneqq 6,\ E \coloneqq 1.9\cdot 10^{7},\ I1 \coloneqq 0.11^{3},\ I2 \coloneqq 1.2\cdot I1\right]$

#3: $\left[W \coloneqq 6,\ E \coloneqq 1.9\cdot 10^{7},\ I1 \coloneqq 0.001331,\ I2 \coloneqq 0.0015972\right]$

Equilibrio estático:

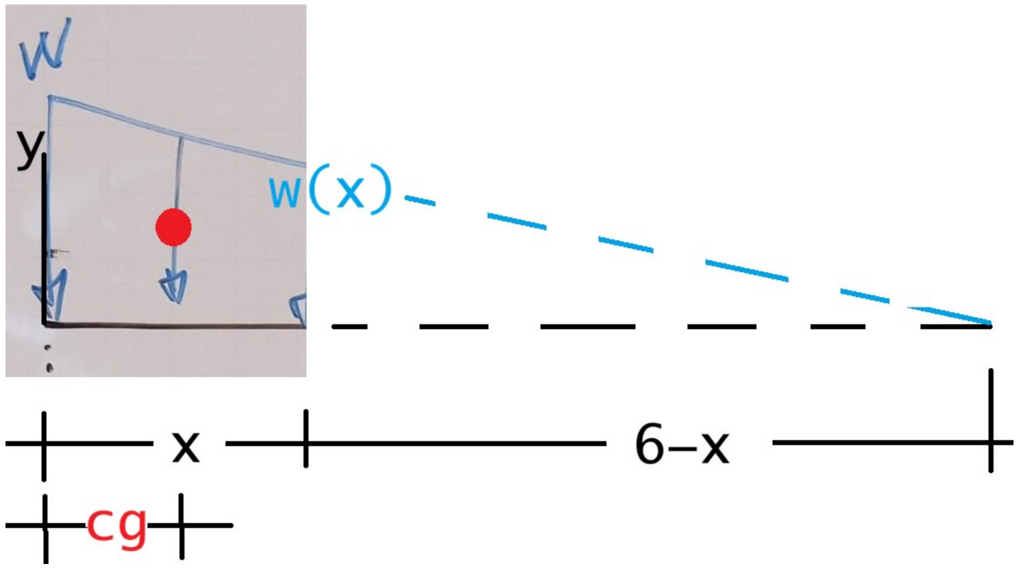
#4: $[Rb \coloneqq,\ Rd \coloneqq]$

#5:
$$\left[\begin{array}{c} Rb + Rd - \dfrac{W\cdot 6}{2} = 0 \\ \\ Rb\cdot 1 + Rd\cdot 6 - \dfrac{W\cdot 6}{2}\cdot\dfrac{6}{3} = 0 \end{array}\right]$$

#6: $\left[Rb = \dfrac{72}{5} \wedge Rd = \dfrac{18}{5}\right]$

#7: $[Rb \coloneqq 14.4,\ Rd \coloneqq 3.6]$

Carga y centroide en cualquier punto x:



#8: [w(x) :=, WT(x) :=, cg(x) :=]

#9: $$\frac{W}{6} = \frac{w(x)}{6 - x}$$

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

#11: $$w(x) := 6 - x$$

#12: $$\left[WT(x) := \frac{W + w(x)}{2}\cdot x,\ cg(x) := \frac{w(x)\cdot x\cdot\frac{x}{2} + \frac{(W - w(x))\cdot x}{2}\cdot\frac{x}{3}}{WT(x)}\right]$$

#13: $$\left[WT(x) := 0.5\cdot x\cdot(12 - x),\ cg(x) := \frac{0.6666666666\cdot x\cdot(x - 9)}{x - 12}\right]$$

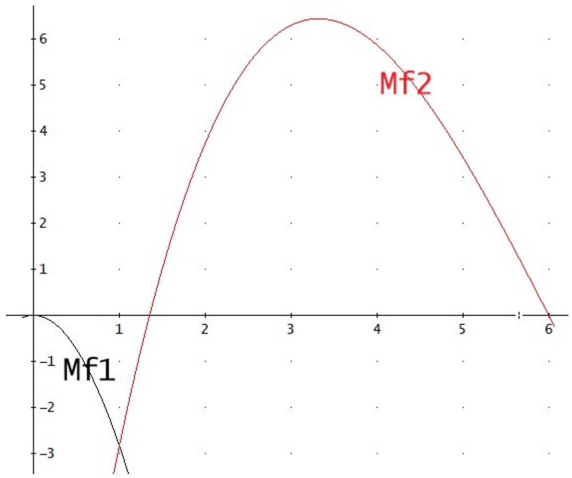
#14: $$\left[WT(x) := \frac{x\cdot(12 - x)}{2},\ cg(x) := \frac{2\cdot x\cdot(x - 9)}{3\cdot(x - 12)}\right]$$

Momentos flectores:

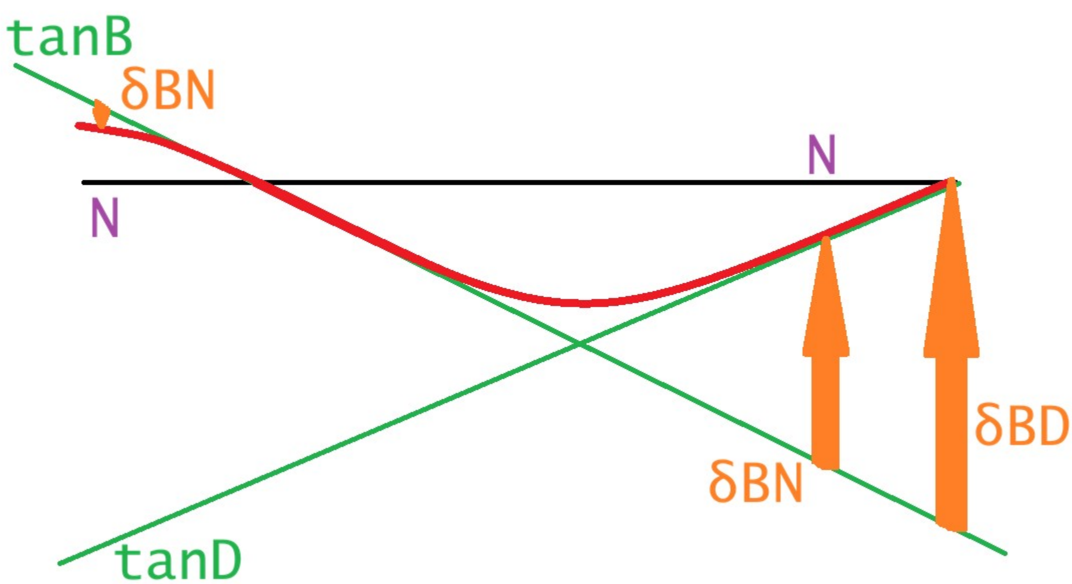
#15: [Mf1 :=, Mf2 :=]

#16: $$\begin{bmatrix} Mf1 := -\ WT(x)\cdot(x - cg(x)) \\ Mf2 := -\ WT(x)\cdot(x - cg(x)) + Rb\cdot(x - 1) \end{bmatrix}$$

#17:
$$\left[\begin{array}{c} Mf1 := \dfrac{x^2\cdot(x - 18)}{6} \\ Mf2 := \dfrac{5\cdot x^3 - 90\cdot x^2 + 432\cdot x - 432}{30} \end{array}\right]$$



Distancias de la tangente en B y la curva elástica en cualquier punto N o x:

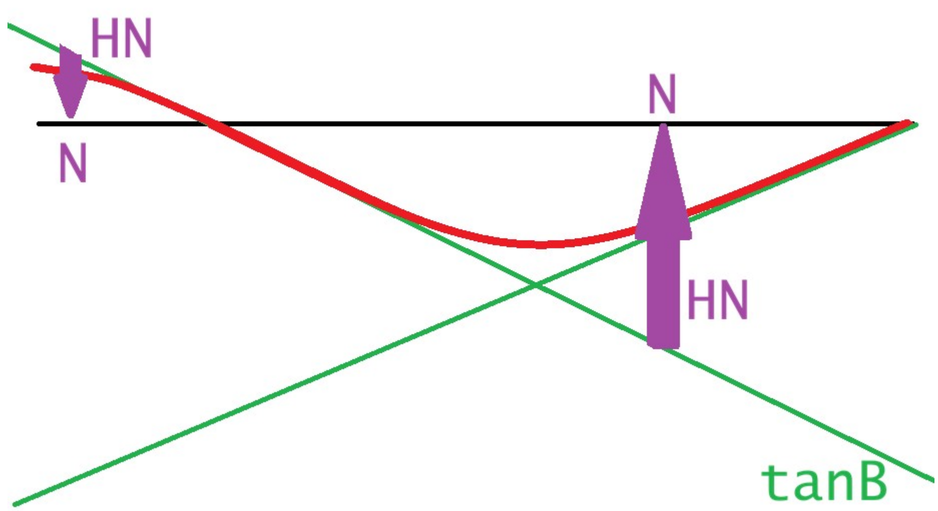


#18: [δBN1 :=, δBN2 :=, δBN3 :=]

#19:
$$\left[\begin{array}{c} \delta BN1 := \dfrac{1}{E}\cdot\left(\dfrac{1}{I1}\cdot\int_1^N Mf1\cdot(N-x)\,dx\right) \\ \delta BN2 := \dfrac{1}{E}\cdot\left(\dfrac{1}{I1}\cdot\int_1^N Mf2\cdot(N-x)\,dx\right) \\ \delta BN3 := \dfrac{1}{E}\cdot\left(\dfrac{1}{I1}\cdot\int_1^4 Mf2\cdot(N-x)\,dx + \dfrac{1}{I2}\cdot\int_4^N Mf2\cdot(N-x)\,dx\right) \end{array}\right]$$

#20:
$$\left[\begin{array}{c} \delta BN1 := \dfrac{N^5 - 30\cdot N^4 + 115\cdot N - 86}{3034680} \\ \delta BN2 := \dfrac{N^5 - 30\cdot N^4 + 288\cdot N^3 - 864\cdot N^2 + 979\cdot N - 374}{3034680} \\ \delta BN3 := \dfrac{5\cdot N^5 - 150\cdot N^4 + 1440\cdot N^3 - 4320\cdot N^2 + 6386\cdot N - 6340}{18208080} \end{array}\right]$$

Distancia entre la tangente en B y la viga antes de la deformación en cualquier punto N o x.
δBD=δBN3(cuando N=6):



#21: HN :=

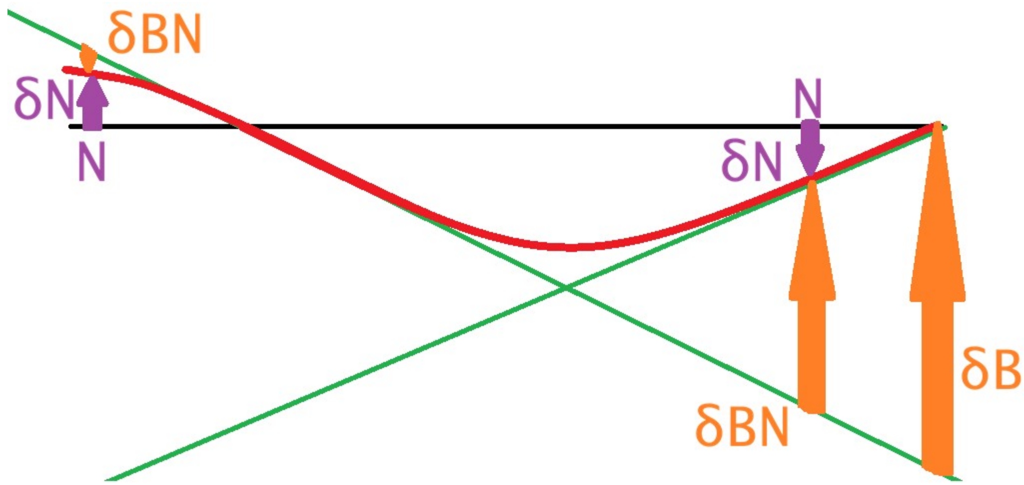
#22: δBD := SUBST(δBN3, [N], [6])

#23: $$\delta BD := \frac{3997}{2276010}$$

#24: $$\frac{\delta BD}{5} = \frac{HN}{N - 1}$$

#25: $$HN := \frac{3997\cdot(N - 1)}{11380050}$$

Curva elástica del desplazamiento de cualquier punto N o x de la viga:



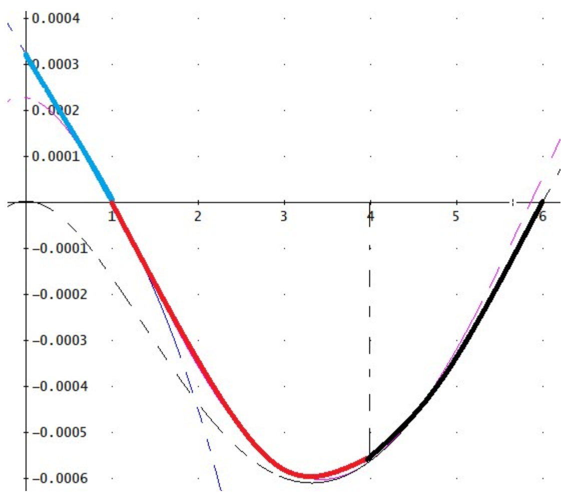
#26: [δN1 :=, δN2 :=, δN3 :=]

#27: $$\begin{bmatrix} \delta N1 := -\ (HN - \delta BN1) \\ \delta N2 := -\ (HN - \delta BN2) \\ \delta N3 := -\ (HN - \delta BN3) \end{bmatrix}$$

#28: $$\begin{bmatrix} \delta N1 := 2.196826903\cdot10^{-8}\cdot(15\cdot N^{5} - 450\cdot N^{4} - 1.4263\cdot10^{4}\cdot N + 1.4698\cdot10^{4}) \\ \delta N2 := 2.196826903\cdot10^{-8}\cdot(15\cdot N^{5} - 450\cdot N^{4} + 4320\cdot N^{3} - 1.296\cdot10^{4}\cdot N^{2} - 1303\cdot N + 1.0378\cdot10^{4}) \\ \delta N3 := 1.098413451\cdot10^{-8}\cdot(25\cdot N^{5} - 750\cdot N^{4} + 7200\cdot N^{3} - 2.16\cdot10^{4}\cdot N^{2} - 46\cdot N + 276) \end{bmatrix}$$

#29:

$$\left[\begin{array}{c} \delta N1 := \dfrac{15\cdot N^{5} - 450\cdot N^{4} - 14263\cdot N + 14698}{45520200} \\[2ex] \delta N2 := \dfrac{15\cdot N^{5} - 450\cdot N^{4} + 4320\cdot N^{3} - 12960\cdot N^{2} - 1303\cdot N + 10378}{45520200} \\[2ex] \delta N3 := \dfrac{25\cdot N^{5} - 750\cdot N^{4} + 7200\cdot N^{3} - 21600\cdot N^{2} - 46\cdot N + 276}{91040400} \end{array}\right]$$



La

La mayor deformación ocurrirá en δN2 n o X=4.43m:

#30: $$0 = \frac{d}{dN}\,\delta N2$$

#31: $$0 = \frac{75\cdot N^{4} - 1800\cdot N^{3} + 12960\cdot N^{2} - 25920\cdot N - 1303}{45520200}$$

#32: $N = 6 - \frac{\sqrt{(4860 - 15\cdot\sqrt{50565})}}{15} \vee N = \frac{\sqrt{(4860 - 15\cdot\sqrt{50565})}}{15} + 6 \vee N = 6 - \frac{\sqrt{(15\cdot\sqrt{50565} + 4860)}}{15} \vee N = \frac{\sqrt{(15\cdot\sqrt{50565} + 4860)}}{15} + 6$

#33: $N = 8.570776443 \vee N = 3.429223556 \vee N = 12.04905847 \vee N = -0.04905847847$

La mayor deformación será de 0.6 mm:

#34: δN2max = SUBST(δN2, N, 3.429223556)

#35: δN2max = -0.0006019583697