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Reacciones

$$R_A = R_B = \frac{P}{2}$$

Esfuerzos cortantes

$$Q_{AC} = -Q_{CB} = \frac{P}{2} = \text{const.}$$

Momentos flectores

$$M_{\text{máx}} = M_C = \frac{Pl}{4}; \text{ para } x_0 = \frac{l}{2}$$

$$M_{AC} = \frac{P}{2}x$$

$$M_{CB} = \frac{P}{2}(l - x)$$

Ángulos de giro

$$\varphi_A = -\varphi_B = \frac{Pl^2}{16EI}$$

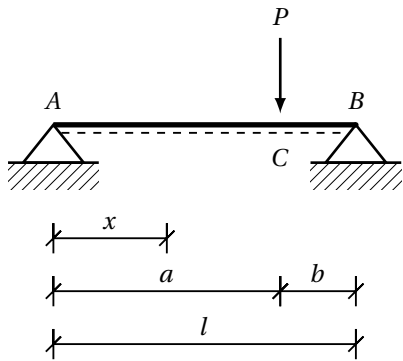
$$\varphi_C = 0$$


Ecuación de la elástica

$$y_{AC} = \frac{Pl^2x}{16EI} \left(1 - \frac{4}{3} \frac{x^2}{l^2} \right)$$

Flecha máxima

$$f_C = \frac{Pl^3}{48EI}$$



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Reacciones

$$R_A = \frac{Pb}{l}$$

$$R_B = \frac{Pa}{l}$$

Esfuerzos cortantes

$$Q_{AC} = \frac{Pb}{l} = \text{const.}$$

$$Q_{CB} = \frac{-Pa}{l} = \text{const.}$$

Momentos flectores

$$M_{\text{máx}} = M_C = \frac{Pab}{l}; \text{ para } x_0 = a$$

$$M_{AC} = \frac{Pb}{l}x$$

$$M_{CB} = \frac{Pa}{l}(l-x)$$

Ángulos de giro

$$\varphi_A = \frac{Pab}{6EI}(l+b)$$

$$\varphi_B = \frac{-Pab}{6EI}(l+a)$$

$$\varphi_C = \frac{-Pab}{3EI}(b-a)$$

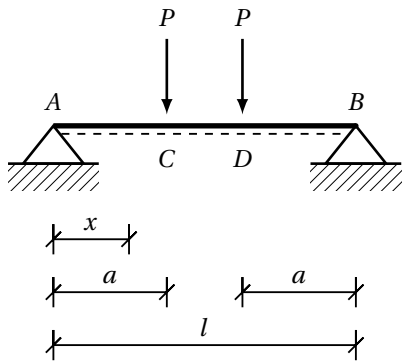
Ecuación de la elástica

$$y_{AC} = \frac{Plbx}{6EI} \left(1 - \frac{b^2}{l^2} - \frac{x^2}{l^2} \right)$$

$$y_{CB} = \frac{Pla(l-x)}{6EI} \left[1 - \frac{a^2}{l^2} - \left(\frac{l-x}{l} \right)^2 \right]$$

Flecha máxima $a > b$

$$f_{\text{máx}} = \frac{Pl}{9EI\sqrt{3}}(l^2 - b^2)^{\frac{3}{2}}; \text{ para } x = \sqrt{\frac{l^2 - b^2}{3}}$$



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Reacciones

$$R_A = R_B = P$$

Esfuerzos cortantes

$$Q_{AC} = -Q_{DB} = P = \text{const.}$$

$$Q_{CD} = 0$$

Momentos flectores

$$M_{\text{máx}} = M_{CD} = Pa = \text{const.}$$

$$M_{AC} = Px$$

$$M_{DB} = P(l - x)$$

Ángulos de giro

$$\varphi_A = -\varphi_B = \frac{Pa(l-a)}{2EI}$$

$$\varphi_C = -\varphi_D = \frac{Pa(l-2a)}{2EI}$$

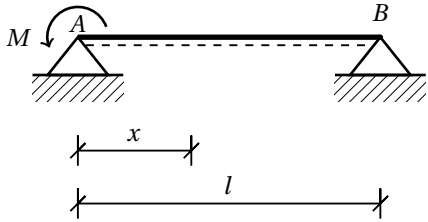
Ecuación de la elástica

$$y_{AC} = \frac{Px}{6EI} (3al - 3a^2 - x^2)$$

$$y_{CD} = \frac{Pa}{6EI} (3lx - 3x^2 - a^2)$$

Flecha máxima

$$f_{\text{máx}} = \frac{Pa}{24EI} (3l^2 - 4a^2) ; \text{ para } x = \frac{l}{2}$$



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Reacciones

$$R_A = -R_B = \frac{M}{l}$$

Esfuerzos cortantes

$$Q_x = \frac{M}{l}$$

Momentos flectores

$$M_x = -M \left(1 - \frac{x}{l}\right)$$

$$M_A = -M$$

$$M_B = 0$$

Ángulos de giro

$$\varphi_A = \frac{-Ml}{3EI}$$

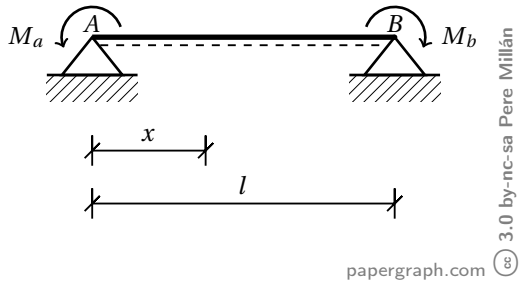
$$\varphi_B = \frac{Ml}{6EI}$$

Ecuación de la elástica

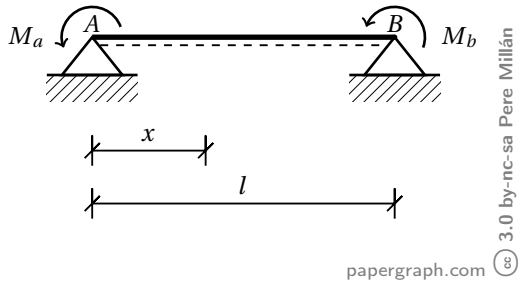
$$y_x = \frac{-Ml}{6EI} (l - x) \left[1 - \left(\frac{l-x}{l}\right)^2\right]$$

Flecha máxima

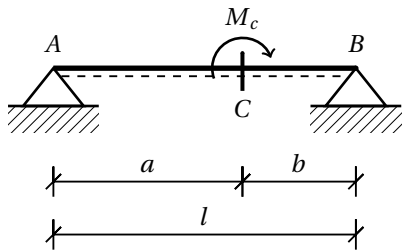
$$f_{m\acute{a}x} = \frac{-Ml^2}{9\sqrt{3}EI} ; \text{ para } x = l \left(1 - \frac{1}{\sqrt{3}}\right)$$



Reacciones	$R_A = -R_B = \frac{M_a - M_b}{l}$		
Esfuerzos cortantes	$Q_x = \frac{M_a - M_b}{l} = \text{const.}$		
Momentos flectores	$M_x = \frac{-M_a}{l}(l - x) - \frac{M_b}{l}x$	$M_A = -M_a$	$M_B = -M_b$
Ángulos de giro	$\varphi_A = \frac{-l}{6EI}(2M_a + M_b)$	$\varphi_B = \frac{l}{6EI}(M_a + 2M_b)$	
Ecuación de la elástica	$y_x = \frac{-M_a \cdot x}{6EI}(l - x) \left[1 + \frac{l-x}{l} + \frac{M_b}{M_a} \left(1 + \frac{x}{l} \right) \right]$		



Reacciones	$R_A = -R_B = \frac{M_a + M_b}{l}$		
Esfuerzos cortantes	$Q_x = \frac{M_a + M_b}{l} = \text{const.}$		
Momentos flectores	$M_x = \frac{-M_a}{l}(l - x) + \frac{M_b}{l}x$	$M_A = -M_a$	$M_B = M_b$
Ángulos de giro	$\varphi_A = \frac{-l}{6EI}(2M_a - M_b)$	$\varphi_B = \frac{-l}{6EI}(2M_b - M_a)$	
Ecuación de la elástica	$y_x = \frac{x(l-x)}{6EI} [(M_a + M_b)x - (2M_a - M_b)l]$		



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Reacciones

$$R_A = -R_B = \frac{-M}{l}$$

Esfuerzos cortantes

$$Q_x = \frac{-M}{l} = \text{const.}$$

Momentos flectores

$$M_{AC} = \frac{-M}{l}x$$

$$M_{CB} = \frac{M}{l}(l-x)$$

$$|M| = \left| M_C^{izq} \right| + \left| M_C^{der} \right|$$

$$M_C^{izq} = \frac{-M}{l}a$$

$$M_C^{der} = \frac{M}{l}b$$

Ángulos de giro

$$\varphi_A = \frac{Ml}{6EI} \left(3\frac{b^2}{l^2} - 1 \right)$$

$$\varphi_B = \frac{Ml}{6EI} \left(3\frac{a^2}{l^2} - 1 \right)$$

$$\varphi_C = \frac{M}{3EI l^2} (a^2 + b^2)$$

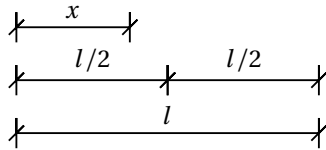
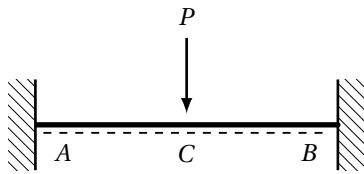
Ecuación de la elástica


$$y_{AC} = \frac{-Mlx}{6EI} \left(1 - 3\frac{b^2}{l^2} - \frac{x^2}{l^2} \right)$$

$$y_{CB} = \frac{Ml(l-x)}{6EI} \left[1 - 3\frac{a^2}{l^2} - \left(\frac{l-x}{l} \right)^2 \right]$$

Flecha

$$f_C = \frac{Mab}{3EI l} (b-a)$$



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Reacciones

$$R_A = R_B = \frac{P}{2}$$

Esfuerzos cortantes

$$Q_{AC} = -Q_{CB} = \frac{P}{2} = \text{const.}$$

Momentos flectores

$$M_{\text{máx}} = M_C = \frac{Pl}{8}; \text{ para } x_0 = \frac{l}{2}$$

$$M_A = M_B = -\frac{Pl}{8}$$

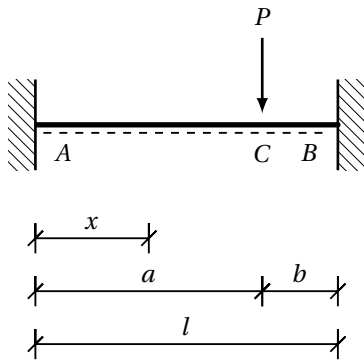
$$M_{AC} = \frac{Pl}{8} \left(4\frac{x}{l} - 1 \right)$$


Ecuación de la elástica

$$y_{AC} = \frac{Plx^2}{48EI} \left(3 - 4\frac{x}{l} \right)$$

Flecha máxima

$$f_C = \frac{Pl^3}{192EI}$$



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Reacciones

$$R_A = \frac{Pb^2}{l^3}(l + 2a)$$

$$R_B = \frac{Pa^2}{l^3}(l + 2b)$$

Esfuerzos cortantes

$$Q_{AC} = \frac{Pb^2}{l^3}(l + 2a) = \text{const.}$$

$$Q_{CB} = \frac{Pa^2}{l^3}(l + 2b) = \text{const.}$$

Momentos flectores

$$M_A = \frac{-Pab^2}{l^2}$$

$$M_C = \frac{2Pa^2b^2}{l^3}; \text{ para } x_0 = a$$

$$M_B = \frac{-Pa^2b}{l^2}$$

$$M_{AC} = \frac{Pb^2}{l^3}(lx + 2ax - al)$$

$$M_{CB} = \frac{Pa^2}{l^3}(lb + l^2 - lx - 2bx)$$

Ecuación de la elástica

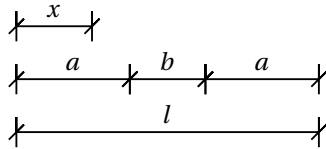
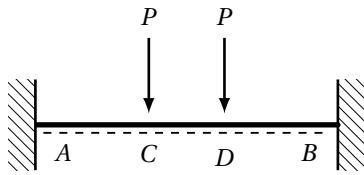
$$y_{AC} = \frac{Pb^2}{6EI} \left(3a - x - \frac{2ax}{l} \right) \frac{x^2}{l^2}$$


$$y_{CB} = \frac{Pa^2}{6EI} \left(3b - (l - x) - 2b \frac{l-x}{l} \right) \frac{(l-x)^2}{l^2}$$

Flechas

$$f_C = \frac{Pa^3b^3}{3EI l^3}$$

$$f_{\text{máx}} = \frac{2Pb^2a^3}{3EI(l+2a)^2}; \text{ para } x = \frac{2al}{l+2a}$$



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Reacciones

$$R_A = R_B = P$$

Esfuerzos cortantes

$$Q_{AC} = P$$

$$Q_{CD} = 0$$

$$Q_{DB} = -P$$

Momentos flectores

$$M_A = \frac{-Pa}{l}(l - a)$$

$$M_{AC} = \frac{P}{l}(lx - la + a^2)$$

$$M_{CD} = \frac{Pa^2}{l} = \text{const.}$$

Ecuación de la elástica

$$y_{AC} = \frac{Px^2}{6EI}(3al - 3a^2 - lx)$$

$$y_{CD} = \frac{Pa^2}{6EI}(-al + 3lx - 3x^2)$$

Flechas máxima

$$f_{máx} = \frac{Pa^2}{24EI}(3l - 4a)$$