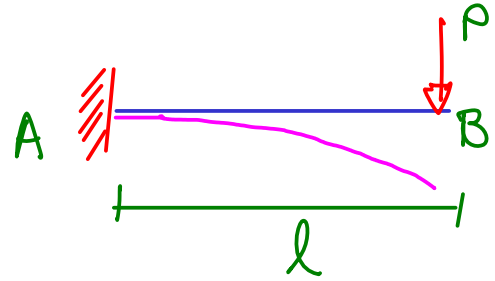
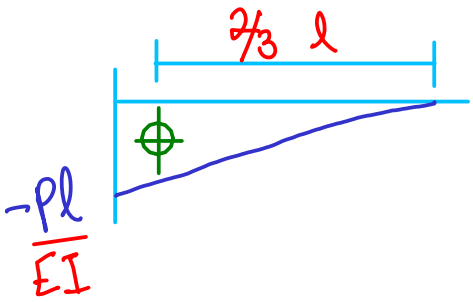


Calcule la pendiente teta B y la deflexión en B en el extremo de la viga en voladizo. El es constante.

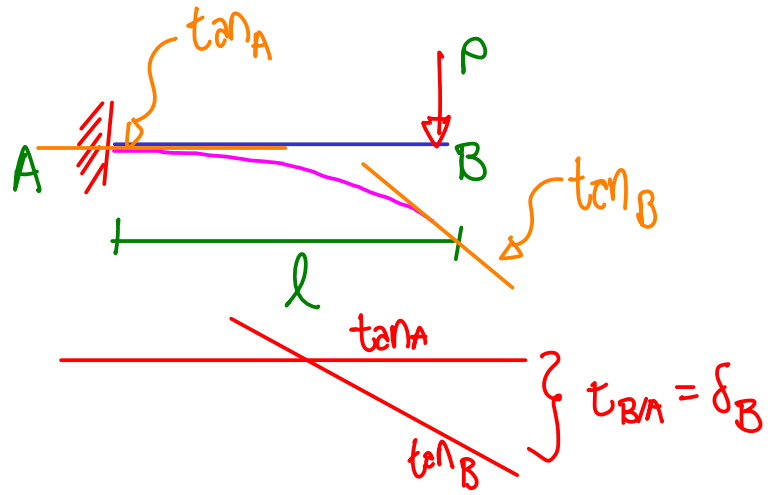


$$\Delta\theta_{AB} = \int_A^B \frac{M}{EI}\,dx$$

$$\theta_A + \Delta\theta_{AB} = \theta_B$$

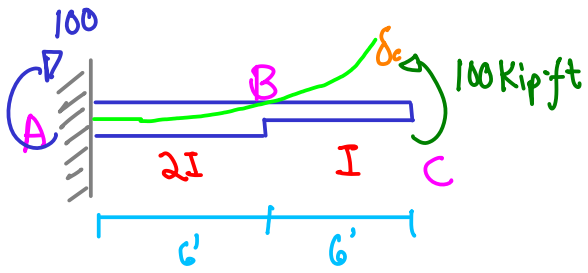
$$\Delta\theta_{AB} = \frac{1}{2}\,l\left(\frac{-Pl}{EI}\right) = \frac{-Pl^2}{2EI}$$

$$\theta_B = 0 + \frac{-Pl^2}{2EI} = \frac{-Pl^2}{2EI}$$

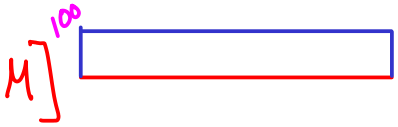


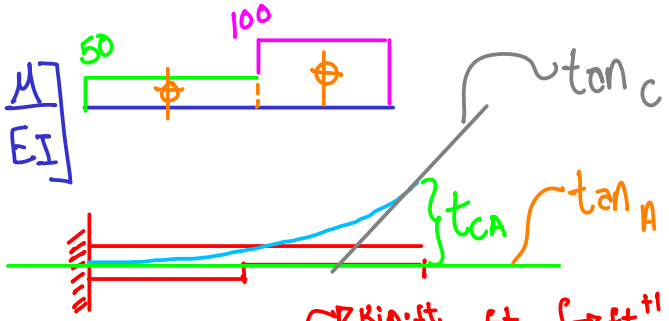
$$t_{B/A} = \int_A^B \frac{M_X}{EI}\,dx$$

$$t_{B/A} = \frac{1}{2}\,l\left(\frac{-Pl}{EI}\right)\left(\frac{2}{3}l\right) = \frac{-Pl^3}{3EI}$$



Calcule la deflexión del punto C en el extremo de la viga en voladizo si E = 29,000 ksi; Iab = 2I; Ibc = 1I; E = constante; I = 400 in⁴.





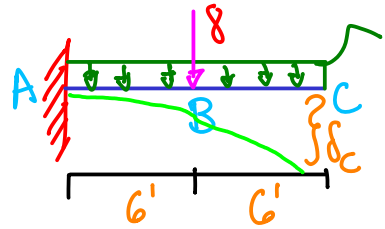
$$t_{CA} = \int_A^C \frac{Mx}{EI}\,dx \quad \text{Kip·ft} \cdot \text{ft} \cdot \text{ft} = \text{ft}^3$$

$$= EI\,\delta_C = (50)(6)(3+6) + (100)(6)(3)$$

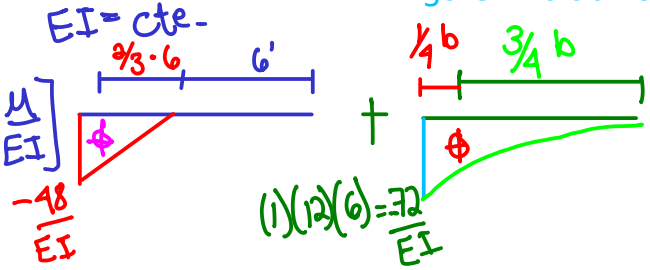
$$= 4500$$

$$\delta_C = \frac{4500}{EI} = \frac{4500\ \text{Kip·ft}^3\,(12\cdot12\cdot12\ \text{in}^3/\text{ft}^3)}{(29{,}000\ \text{ksi})(400\ \text{in}^4)}$$

$$= 0.67\text{in}$$



Calcule la pendiente de la curva elástica en B y en C; y la deflexión en C para la viga en voladizo.



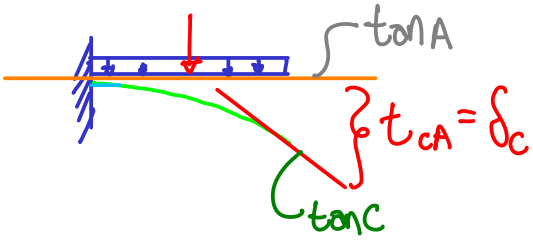
$$\theta_C = \theta_A + \Delta\theta_{AC} = 0 + \int_A^C \frac{M}{EI}\,dx$$

$$\theta_C = \frac{1}{2}(6)\left(\frac{-48}{EI}\right) + \frac{1}{3}(12)\left(\frac{-72}{EI}\right)$$

$$\theta_C = -\frac{144}{EI} - \frac{288}{EI} = \frac{-432}{EI}\ \text{rad}$$

$$\delta_C = t_{CA} = \int_A^C \frac{M}{EI}x\,dx$$

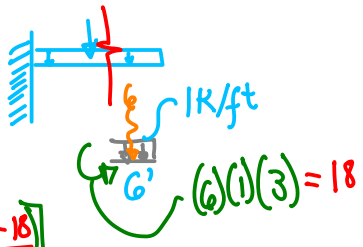
$$\delta_C = \frac{1}{2}(6)\left(\frac{-48}{EI}\right)\left(6+\frac{2}{3}\cdot6\right) + \frac{1}{3}(12)\left(\frac{-72}{EI}\right)\left(\frac{3}{4}\cdot12\right)$$



$$\delta_C = \frac{-144}{EI}(10) - \frac{288}{EI}(9) = \frac{-1440-2592}{EI} = \frac{-4032}{EI}$$

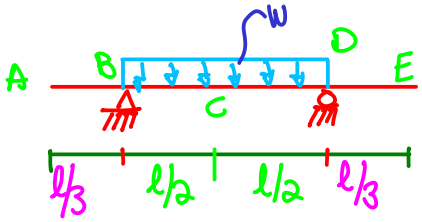
Pendiente o rotacion en B

$$\theta_B = \theta_A + \Delta\theta_{AB} = 0 + \int_A^B \frac{M}{EI}\,dx$$

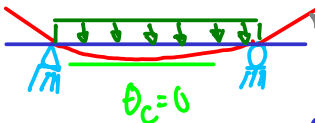


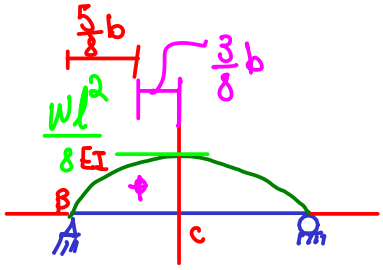
$$= \frac{1}{2}(6)\left(\frac{-48}{EI}\right) + \left[\frac{1}{3}(12)\left(\frac{-72}{EI}\right) - \frac{1}{3}(6)\left(\frac{-18}{EI}\right)\right]$$

$$= \frac{-144}{EI} + \frac{-252}{EI} = \frac{-396}{EI}\ \text{rad.}$$



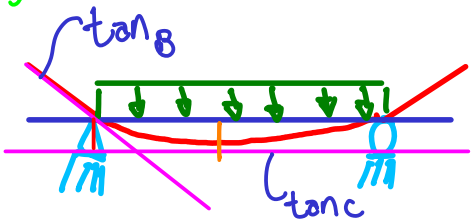
Para la viga, calcule la pendiente en B, y las deflexiones en el punto A y el centro del claro.





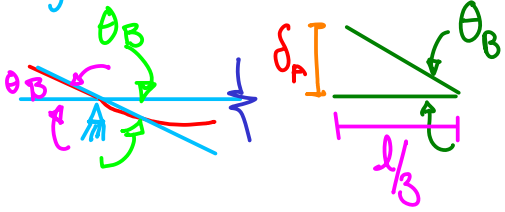
$$\theta_B = \theta_C + \Delta\theta_{CB} = 0 + \int_B^C \frac{M}{EI}\,dx = \frac{2}{3}\left(\frac{l}{2}\right)\left(\frac{wl^2}{8EI}\right) = \frac{wl^3}{24EI}$$

Deflexion en C



$$t_{BC} = \delta_C = \frac{2}{3}\left(\frac{l}{2}\right)\left(\frac{wl^2}{8EI}\right)\left(\frac{5}{8}\cdot\frac{l}{2}\right) = \frac{5wl^4}{384EI}$$

Deflexion en A



$$\delta_A = \theta_B\left(\frac{l}{3}\right) = \frac{wl^3}{24EI}\left(\frac{l}{3}\right)$$

$$= \frac{wl^4}{72EI}$$