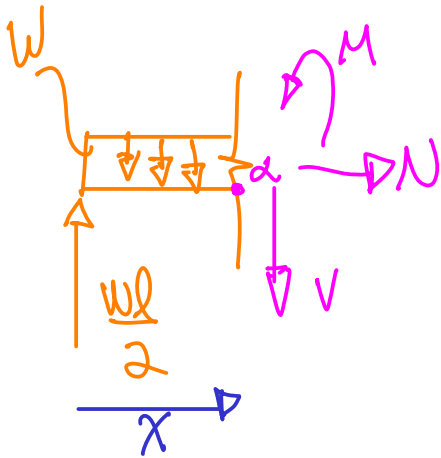
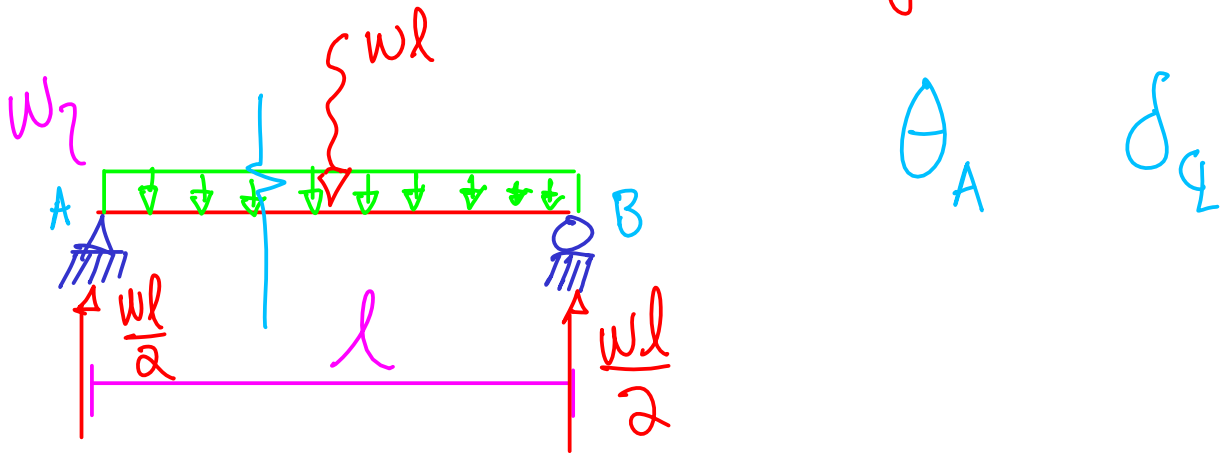


Método de la doble integración



$$\sum M_A = -\frac{wl}{2}(x) + wx\left(\frac{x}{2}\right) + M = 0$$

$$M = \frac{wxl}{2} - \frac{wx^2}{2}$$

$$\frac{M}{EI} = \frac{d^2 y}{dx^2}$$

$$M = EI \frac{d^2 y}{dx^2} = \frac{wxl}{2} - \frac{wx^2}{2}$$

Integrando:

$$(\alpha) \quad EI \frac{dy}{dx} = \frac{wx^2 l}{4} - \frac{wx^3}{6} + C_1$$

$$(\beta) \quad EI y = \frac{wx^3 l}{12} - \frac{wx^4}{24} + C_1 x + C_2$$

$$y = y(x)$$

$$y(0) = 0$$

Sustituyendo en β

$$EI(0) = 0 - 0 + 0 + C_2 \therefore C_2 = 0$$

$$y(l) = 0$$

$$EI(0) = \frac{2wl^4}{24} - \frac{wl^4}{24} + C_1 l + 0$$

$$\frac{-1}{24} wl^4 = C_1 l \quad C_1 = \underline{\underline{\frac{-wl^3}{24}}}$$

Rotación

$$EI \frac{dy}{dx} = \frac{wx^2 l}{4} - \frac{wx^3}{6} + C_1$$

(2)

$$EI \frac{dy}{dx} = \frac{wx^2 l}{4} - \frac{wx^3}{6} - \frac{wl^3}{24} //$$

Deflexión

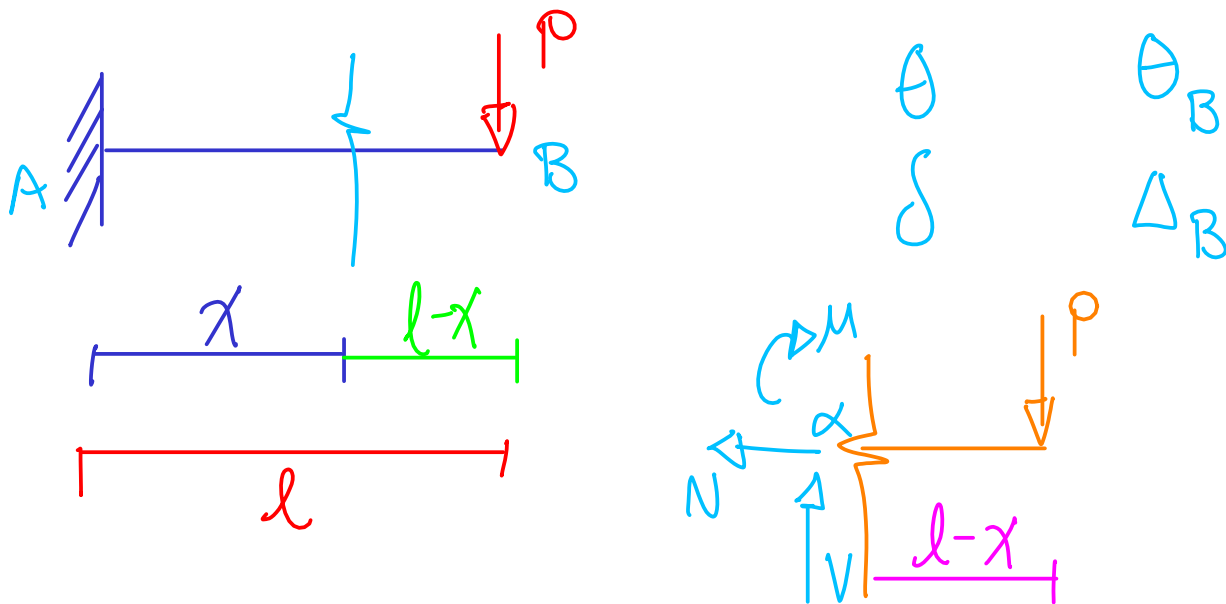
$$EI y = \frac{wx^3 l}{12} - \frac{wx^4}{24} + C_1 x + C_2$$

(2)

$$EI y = \frac{wx^3 l}{12} - \frac{wx^4}{24} - \frac{wxl^3}{24} //$$

$$(2) \quad \theta_A = 0 - 0 - \frac{wl^3}{24EI} = \frac{-wl^3}{24EI}$$

$$(7) \quad y_G = \frac{wl^4}{96EI} - \frac{wl^4}{(16)(24)EI} - \frac{wl^4}{48EI} = \frac{-5wl^4}{384EI}$$



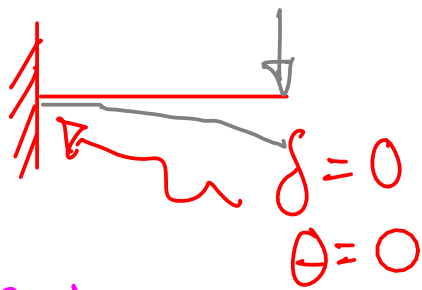
$$\sum M_\alpha = M_\alpha + P(l-x) = 0$$

$$M_\alpha = -Pl + Px$$

$$\frac{M}{EI} = \frac{d^2 y}{dx^2}$$

Rotación (α) $\frac{dy}{dx} EI = -Plx + \frac{Px^2}{2} + C_1$

Deflexión (β) $y EI = -\frac{Plx^2}{2} + \frac{Px^3}{6} + C_1 x + C_2$



$$\theta(0) = 0$$

$$\alpha \rightarrow \frac{dy}{dx} = \frac{-Pl(0)}{EI} + \frac{P(0)^2}{2EI} + \frac{C_1}{EI}$$

$$\delta(0) = 0$$

$$\therefore C_1 = 0$$

$$\beta \rightarrow y = \frac{-Pl(0)^2}{2EI} + \frac{P(0)^3}{6EI} + 0 + \frac{C_2}{EI} = 0 \quad \therefore C_2 = 0$$

$$\theta = \frac{-Plx}{EI} + \frac{Pl^2}{2EI}$$

$$\text{Si } x=l \rightarrow \theta_B = \frac{-Pl^2}{EI} + \frac{Pl^2}{2EI} = \frac{-Pl^2}{2EI} \quad \checkmark$$

$$y = \delta = \frac{-Plx^2}{2EI} + \frac{Px^3}{6EI}$$

$$\text{Si } x=l \rightarrow \delta_B = \frac{-Pl^3}{2EI} + \frac{Pl^3}{6EI} = \frac{-1Pl^3}{3EI} \quad \checkmark$$