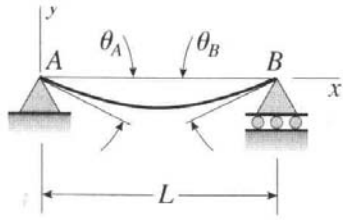


## TABLA DE DEFLEXIONES EN VIGAS SIMPLEMENTE APOYADAS



$EI = \text{constante}$

$v =$  deflexión en la dirección  $y$  (positiva hacia arriba)

$v' = dv/dx =$  pendiente de la curva de deflexión

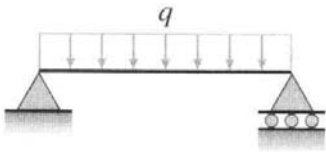
$\delta_C = -v(L/2) =$  deflexión en el punto medio  $C$  de la viga (positiva hacia abajo)

$x_1 =$  distancia del soporte  $A$  al punto de deflexión máxima

$\delta_{\text{máx}} = -v_{\text{máx}} =$  deflexión máxima (positiva hacia abajo)

$\theta_A = -v'(0) =$  ángulo de rotación en el extremo izquierdo de la viga (positivo en sentido horario)

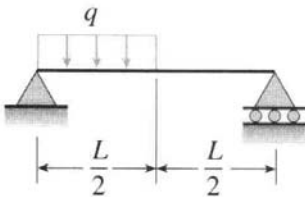
$\theta_B = v'(L) =$  ángulo de rotación en el extremo derecho de la viga (positivo en sentido de antihorario)



$$v = -\frac{qx}{24EI}(L^3 - 2Lx^2 + x^3)$$

$$v' = -\frac{q}{24EI}(L^3 - 6Lx^2 - 4x^3)$$

$$\delta_C = \delta_{\text{máx}} = \frac{5qL^4}{384EI} \quad \theta_A = \theta_B = \frac{qL^3}{24EI}$$



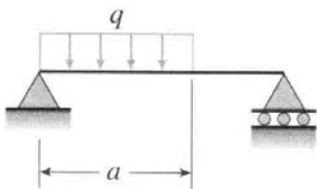
$$v = -\frac{qx}{384EI}(9L^3 - 24Lx^2 + 16x^3) \quad \left(0 \leq x \leq \frac{L}{2}\right)$$

$$v' = -\frac{q}{384EI}(9L^3 - 72Lx^2 + 64x^3) \quad \left(0 \leq x \leq \frac{L}{2}\right)$$

$$v = -\frac{qL}{384EI}(8x^3 - 24Lx^2 + 17L^2x - L^3) \quad \left(\frac{L}{2} \leq x \leq L\right)$$

$$v' = -\frac{qL}{384EI}(24x^2 - 48Lx + 17L^2) \quad \left(\frac{L}{2} \leq x \leq L\right)$$

$$\delta_C = \frac{5qL^4}{768EI} \quad \theta_A = \frac{3qL^3}{128EI} \quad \theta_B = \frac{7qL^3}{384EI}$$



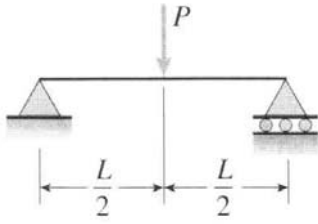
$$v = -\frac{qx}{24LEI}(a^4 - 4a^3L + 4a^2L^2 + 2a^2x^2 - 4aLx^2 + Lx^3) \quad (0 \leq x \leq a)$$

$$v' = -\frac{q}{24LEI}(a^4 - 4a^3L + 4a^2L^2 + 6a^2x^2 - 12aLx^2 + 4Lx^3) \quad (0 \leq x \leq a)$$

$$v = -\frac{qa^2}{24LEI}(-a^2L + 4L^2x + a^2x - 6Lx^2 + 2x^3) \quad (a \leq x \leq L)$$

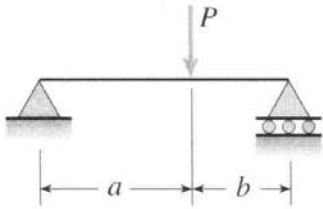
$$v' = -\frac{qa^2}{24LEI}(4L^2 + a^2 - 12Lx + 6x^2) \quad (a \leq x \leq L)$$

$$\theta_A = \frac{qa^2}{24LEI}(2L - a)^2 \quad \theta_B = \frac{qa^2}{24LEI}(2L^2 - a^2)$$



$$v = -\frac{Px}{48EI}(3L^2 - 4x^2) \quad v' = -\frac{P}{16EI}(L^2 - 4x^2) \quad \left(0 \leq x \leq \frac{L}{2}\right)$$

$$\delta_C = \delta_{\max} = \frac{PL^3}{48EI} \quad \theta_A = \theta_B = \frac{PL^2}{16EI}$$

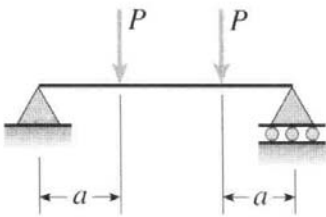


$$v = -\frac{Pbx}{6LEI}(L^2 - b^2 - x^2) \quad v' = -\frac{Pb}{6LEI}(L^2 - b^2 - 3x^2) \quad (0 \leq x \leq a)$$

$$\theta_A = \frac{Pab(L+b)}{6LEI} \quad \theta_B = \frac{Pab(L+a)}{6LEI}$$

$$\text{Si } a \geq b, \quad \delta_C = \frac{Pb(3L^2 - 4b^2)}{48EI} \quad \text{Si } a \leq b, \quad \delta_C = \frac{Pa(3L^2 - 4a^2)}{48EI}$$

$$\text{Si } a \geq b, \quad x_1 = \sqrt{\frac{L^2 - b^2}{3}} \quad \text{y} \quad \delta_{\max} = \frac{Pb(L^2 - b^2)^{3/2}}{9\sqrt{3}LEI}$$



$$v = -\frac{Px}{6EI}(3aL - 3a^2 - x^2) \quad v' = -\frac{P}{2EI}(aL - a^2 - x^2) \quad (0 \leq x \leq a)$$

$$v = -\frac{Pa}{6EI}(3Lx - 3x^2 - a^2) \quad v' = -\frac{Pa}{2EI}(L - 2x) \quad (a \leq x \leq L - a)$$

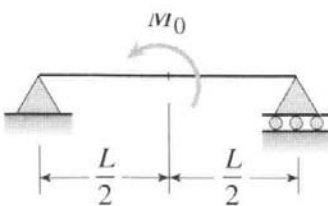
$$\delta_C = \delta_{\max} = \frac{Pa}{24EI}(3L^2 - 4a^2) \quad \theta_A = \theta_B = \frac{Pa(L-a)}{2EI}$$



$$v = -\frac{M_0x}{6LEI}(2L^2 - 3Lx + x^2) \quad v' = -\frac{M_0}{6LEI}(2L^2 - 6Lx + 3x^2)$$

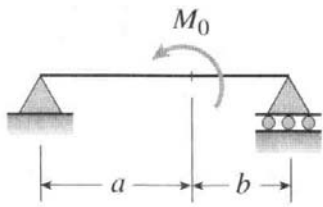
$$\delta_C = \frac{M_0L^2}{16EI} \quad \theta_A = \frac{M_0L}{3EI} \quad \theta_B = \frac{M_0L}{6EI}$$

$$x_1 = L\left(1 - \frac{\sqrt{3}}{3}\right) \quad \text{y} \quad \delta_{\max} = \frac{M_0L^2}{9\sqrt{3}EI}$$



$$v = -\frac{M_0x}{24LEI}(L^2 - 4x^2) \quad v' = -\frac{M_0}{24LEI}(L^2 - 12x^2) \quad \left(0 \leq x \leq \frac{L}{2}\right)$$

$$\delta_C = 0 \quad \theta_A = \frac{M_0L}{24EI} \quad \theta_B = -\frac{M_0L}{24EI}$$



$$v = -\frac{M_0 x}{6EI} (6aL - 3a^2 - 2L^2 - x^2) \quad (0 \leq x \leq a)$$

$$v' = -\frac{M_0}{6EI} (6aL - 3a^2 - 2L^2 - 3x^2) \quad (0 \leq x \leq a)$$

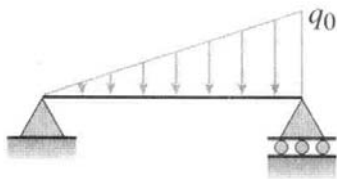
$$\text{con } x = a: \quad v = -\frac{M_0 ab}{3EI} (2a - L) \quad v' = -\frac{M_0}{3EI} (3aL - 3a^2 - L^2)$$

$$\theta_A = \frac{M_0}{6EI} (6aL - 3a^2 - 2L^2) \quad \theta_B = \frac{M_0}{6EI} (3a^2 - L^2)$$



$$v = -\frac{M_0 x}{2EI} (L - x) \quad v' = -\frac{M_0}{2EI} (L - 2x)$$

$$\delta_C = \delta_{\text{máx}} = \frac{M_0 L^2}{8EI} \quad \theta_A = \theta_B = \frac{M_0 L}{2EI}$$

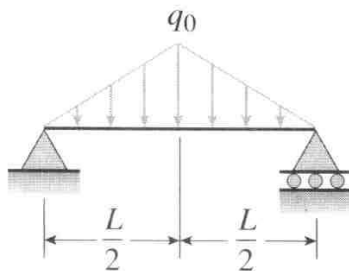


$$v = -\frac{q_0 x}{360EI} (7L^4 - 10L^2 x^2 + 3x^4)$$

$$v' = -\frac{q_0}{360EI} (7L^4 - 30L^2 x^2 + 15x^4)$$

$$\delta_C = \frac{5q_0 L^4}{768EI} \quad \theta_A = \frac{7q_0 L^3}{360EI} \quad \theta_B = \frac{q_0 L^3}{45EI}$$

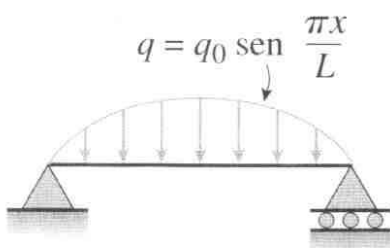
$$x_1 = 0.5193L \quad \delta_{\text{máx}} = 0.00652 \frac{q_0 L^4}{EI}$$



$$v = -\frac{q_0 x}{960EI} (5L^2 - 4x^2)^2 \quad \left(0 \leq x \leq \frac{L}{2}\right)$$

$$v' = -\frac{q_0}{192EI} (5L^2 - 4x^2)(L^2 - 4x^2) \quad \left(0 \leq x \leq \frac{L}{2}\right)$$

$$\delta_C = \delta_{\text{máx}} = \frac{q_0 L^4}{120EI} \quad \theta_A = \theta_B = \frac{5q_0 L^3}{192EI}$$



$$v = -\frac{q_0 L^4}{\pi^4 EI} \text{sen} \frac{\pi x}{L} \quad v' = -\frac{q_0 L^3}{\pi^3 EI} \text{cos} \frac{\pi x}{L}$$

$$\delta_C = \delta_{\text{máx}} = \frac{q_0 L^4}{\pi^4 EI} \quad \theta_A = \theta_B = \frac{q_0 L^3}{\pi^3 EI}$$