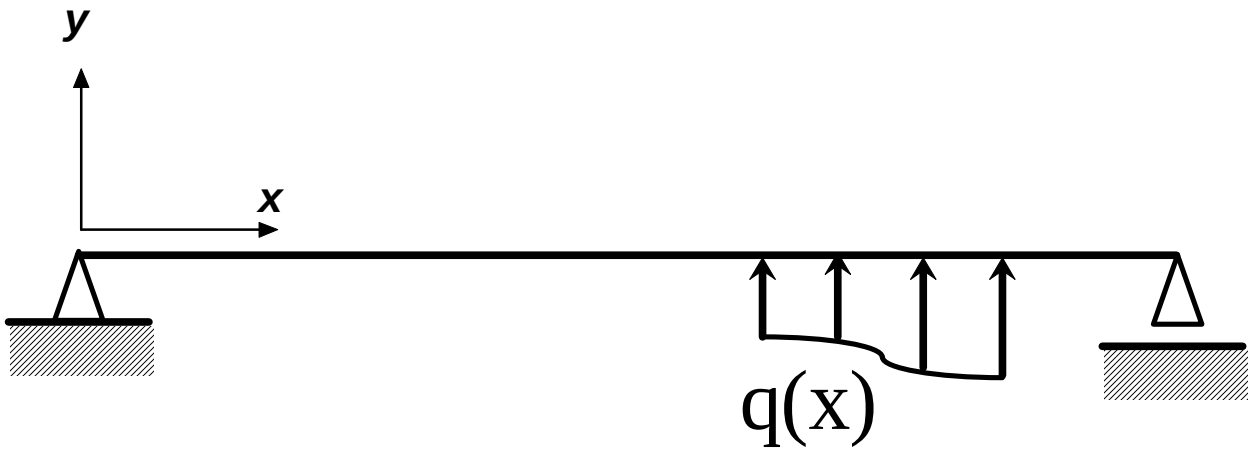
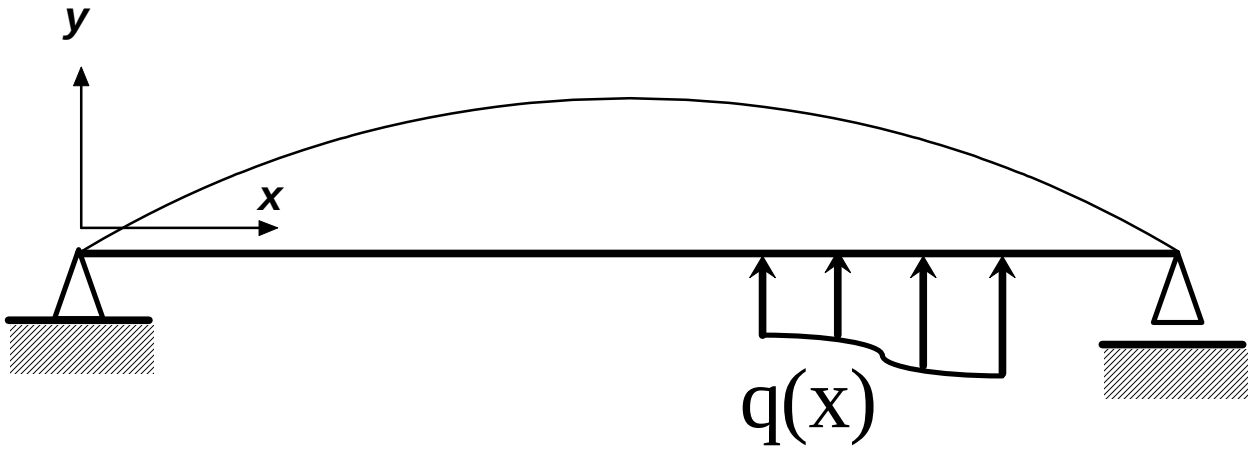
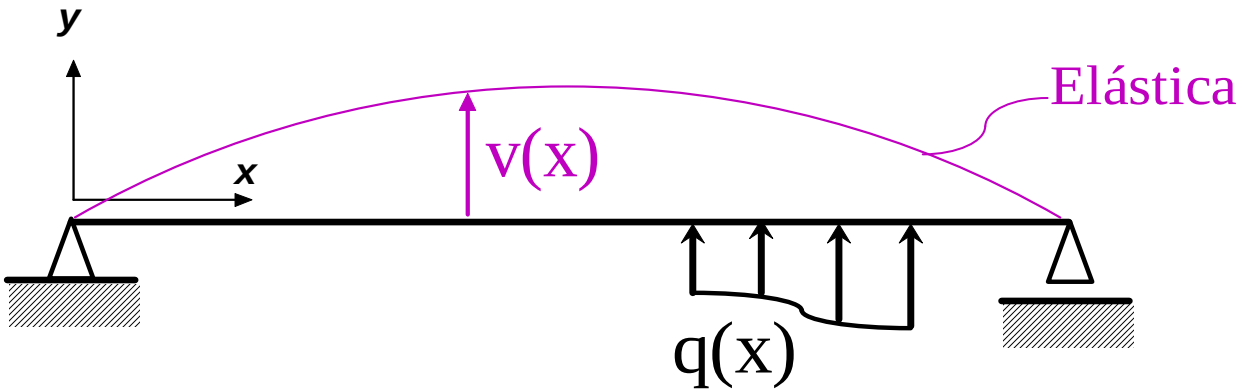
DESPLAZAMIENTOS (Y GIROS) EN FLEXIÓN



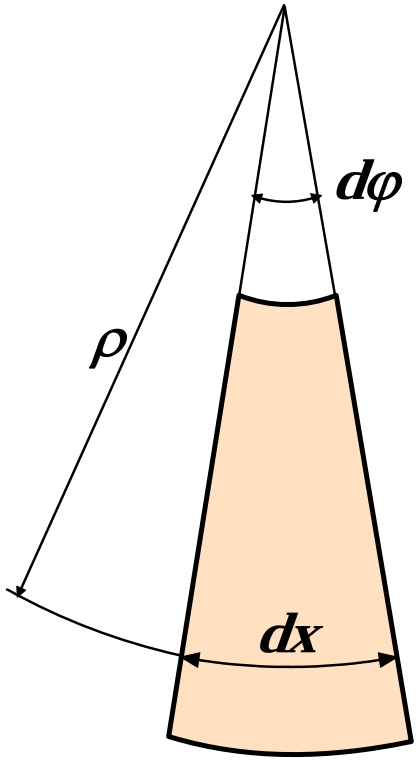


Pequeña deformación:

Ecuación diferencial de la elástica



$$\frac{1}{\rho} = \frac{M_z}{EI_z}$$



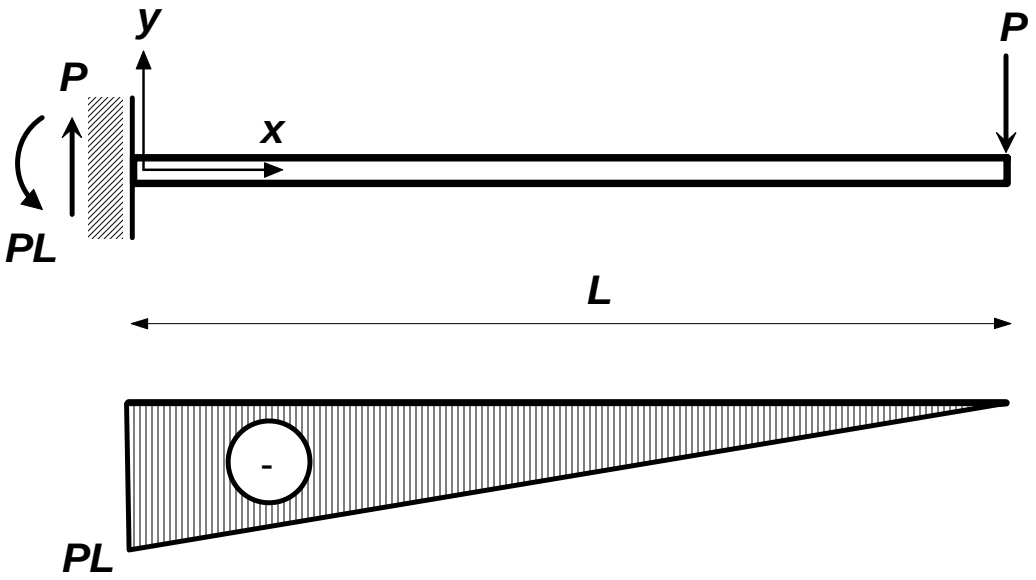
$$\rho\, d\varphi = dx$$

Pequeña deformación:

$$\rightarrow \quad \frac{1}{\rho} = v''(x)$$

$$v^{IV)} = \frac{q_y}{EI_z}$$

Ejemplos



M_z

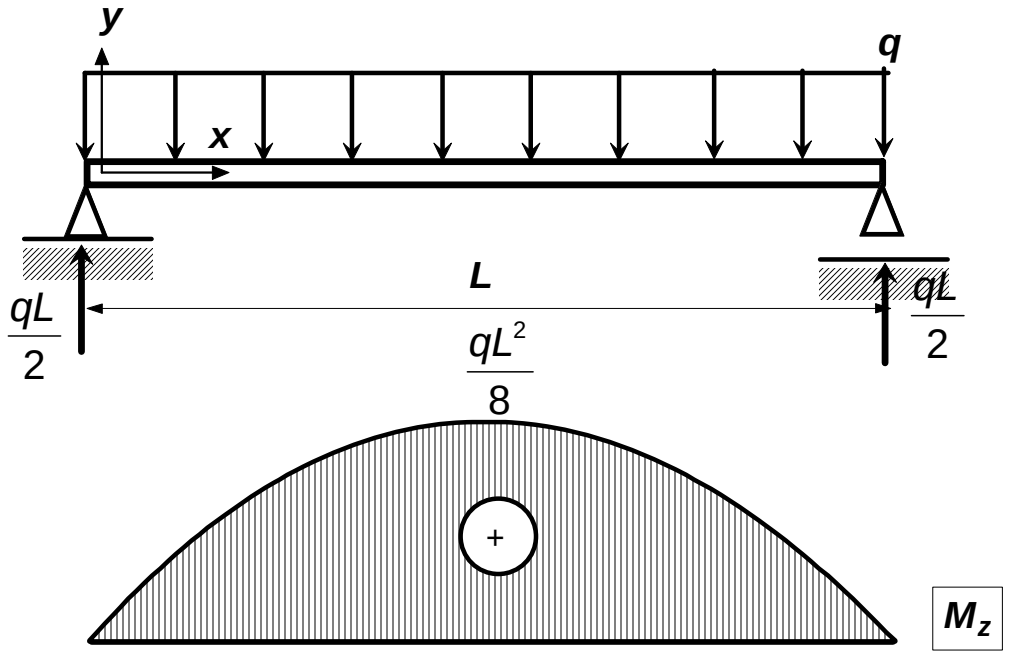
$$M_z =$$

$$EI_z v'' = -PL + Px$$

$$EI_z v(x) = -PL\frac{x^2}{2} + P\frac{x^3}{6} + C_1 x + C_0$$

Condiciones de contorno:

Ejemplos



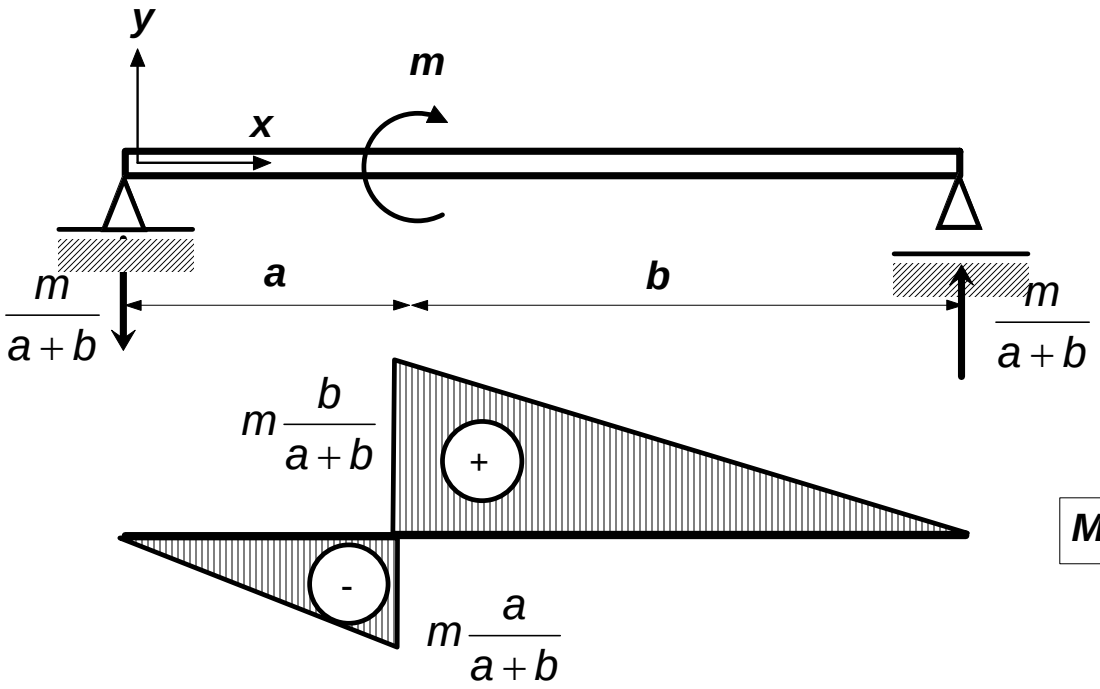
$$M_z = \frac{qL}{2}x - q\frac{x^2}{2}$$

$$EI_z v'' = \frac{qL}{2}x - q\frac{x^2}{2}$$

$$EI_z v(x) = \frac{qL}{2}\frac{x^3}{6} - q\frac{x^4}{24} + C_1 x + C_0$$

Condiciones de contorno: $v(0) = 0 \rightarrow C_0 = 0$

Ejemplos



M_z

$$\begin{cases} 0 \le x < a \quad M_z = -\dfrac{m}{a+b}x \\ a \le x \quad M_z = -\dfrac{m}{a+b}x + m \end{cases}$$

$$\begin{cases} 0 \le x < a \quad EI_z v'' = -\dfrac{m}{a+b}x \\ a \le x \quad EI_z v'' = -\dfrac{m}{a+b}x + m \end{cases}$$

$$\begin{cases} 0 \le x < a \quad EI_z v = -\dfrac{m}{a+b}\dfrac{x^3}{6} + C_1 x + C_0 \\ a \le x \quad EI_z v'' = -\dfrac{m}{a+b}\dfrac{x^3}{6} + m\dfrac{x^2}{2} + C_3 x + C_2 \end{cases}$$

Condiciones de contorno: $v(0) = 0 \quad v(L) = 0$