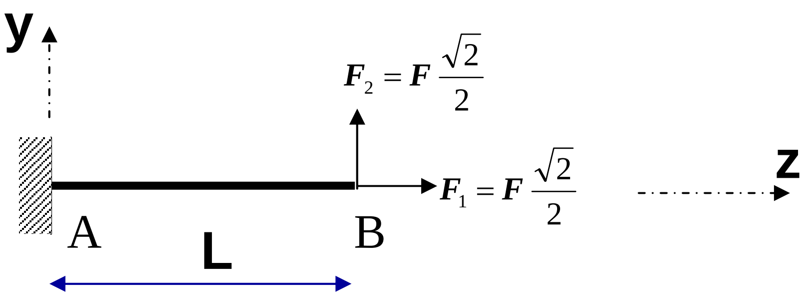
Determinar los desplazamientos que experimenta la sección B de la ménsula de la figura utilizando el teorema de Castigliano



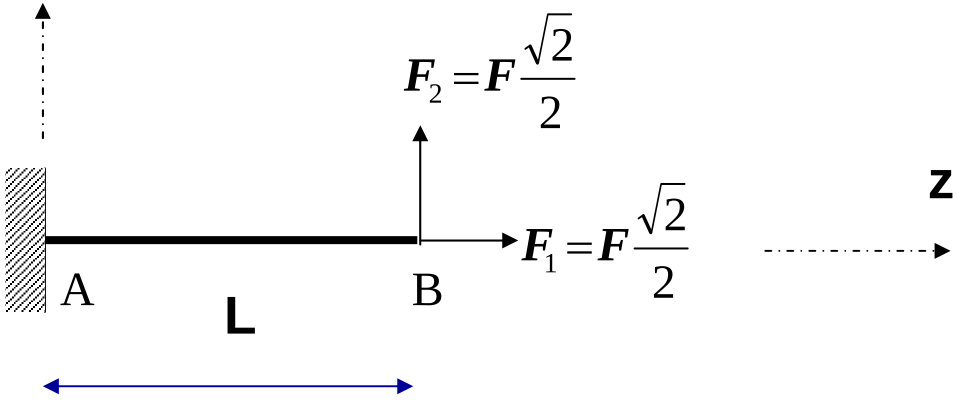
$$\frac{\partial U}{\partial F_j} = d_i$$

$$U = \frac{1}{2}\int_{z=0}^{z=L}\left[\frac{N^2(z)}{EA} + \frac{M^2(z)}{EI_x} + \frac{Q_y^2(z)}{G\Omega_c} + \frac{M_z^2(z)}{GK}\right]dz$$

$$N = F_1 = F\frac{\sqrt{2}}{2} \qquad Q_y = F_2 = F\sqrt{2}/2$$

$$M(z) = F_2 \cdot (L - z) = F\sqrt{2}/2\,(L - z) \qquad M_z = 0$$

$$U = \frac{1}{2}\left[\frac{F_1^2}{EA}\cdot L + \frac{F_2^2}{EI_x}\cdot\frac{L^3}{3} + \frac{F_2^2}{G\Omega_c}\cdot L\right]$$



$$U = \frac{1}{2}\left[\frac{F_1^2}{EA}\cdot L + \frac{F_2^2}{EI_x}\cdot\frac{L^3}{3} + \frac{F_2^2}{G\Omega_c}\cdot L\right]$$

$$d_1 = \frac{\partial U}{\partial F_1} = \frac{F_1}{EA}\cdot L = \frac{\sqrt{2}F\cdot L}{2EA}$$

$$d_2 = \frac{\partial U}{\partial F_2} = \frac{F_2}{EI_x}\cdot L^3 + \frac{F_2}{E\Omega_c}\cdot L = \frac{\sqrt{2}F\cdot L^3}{2EI_x} + \frac{\sqrt{2}F\cdot L}{2E\Omega_c}$$