

Informe de solución de problemas sobre el momento de una fuerza

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Problema 1.

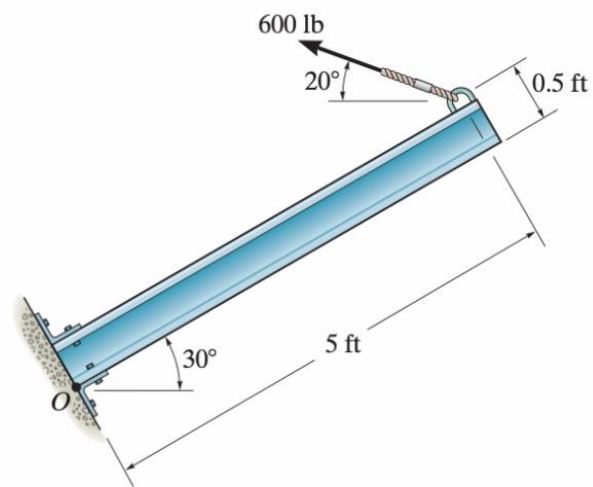


Figura 1: Problema 1

Calculo del momento de la fuerza.

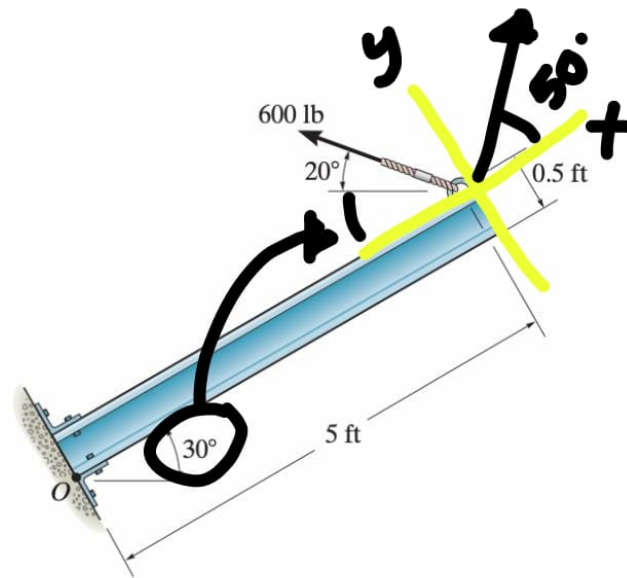


Figura 2: Componentes que actúan

$$20^\circ + 30^\circ = 50^\circ$$

$$r_x = 5 \text{ ft}$$

$$r_y = -0.5 \text{ ft}$$

$$F_x = 600 \cos 50^\circ \text{ lb}$$

$$F_y = 600 \sin 50^\circ \text{ lb}$$

Sustituyendo

$$M_o = (600 \sin 50^\circ \text{ lb})(5 \text{ ft}) - (600 \cos 50^\circ \text{ lb})(-0.5 \text{ ft})$$

$$M_o = 2298.13 + 192.83$$

$$M_o = 2490.96 \text{ lb}\cdot\text{ft}$$

Problema 2.

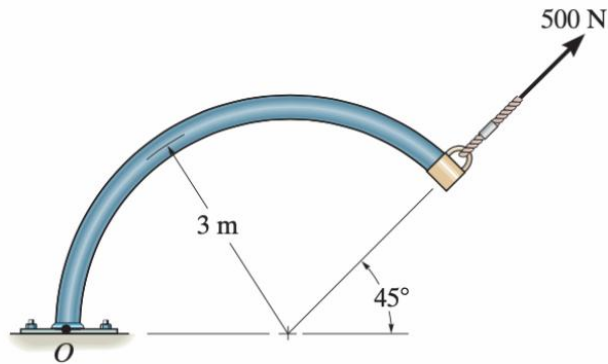


Figura 3: Problema 2

$$r_x = 3 + 3 \cos 45^\circ \text{ m}$$

$$r_y = 3 \sin 45^\circ \text{ m}$$

$$F_x = 500 \cos 45^\circ \text{ N}$$

$$F_y = 500 \sin 45^\circ \text{ N}$$

Sustituyendo

$$M_o = (3 + 3 \cos 45^\circ \text{ m})(500 \sin 45^\circ \text{ N}) - (3 \sin 45^\circ \text{ m})(500 \cos 45^\circ \text{ N})$$

$$M_o = 1810.66 \text{ N}\cdot\text{m} - 750 \text{ N}\cdot\text{m}$$

$$M_o = 1060.66 \text{ N}\cdot\text{m}$$

Problema 3.

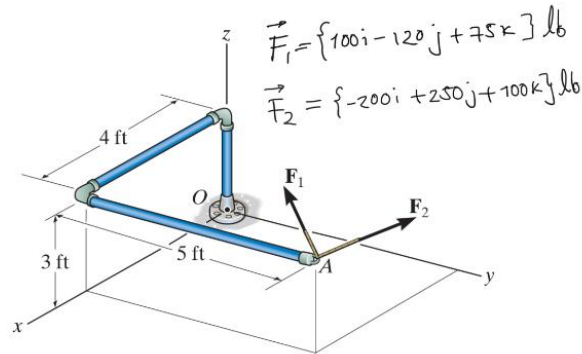


Figura 4: Problema 3

$$r_x = 4 \text{ ft}$$

$$r_y = 5 \text{ ft}$$

$$r_z = 3 \text{ ft}$$

$$F_R = F_1 + F_2 = \{-100 i + 130 j + 175 k\} \text{ lb}$$

Por lo tanto se hace lo siguiente:

$$\begin{array}{r} \bar{A} \times \bar{B} = \begin{array}{ccc} i & j & k \\ 4 & 5 & 3 \\ -100 & 130 & 175 \end{array} = i [875-390] - j [700+300] + k [520+500] \end{array}$$

$$\bar{A} \times \bar{B} = \{485 i - 1000 j + 1020 k\} \text{ lb} \cdot \text{ft}$$