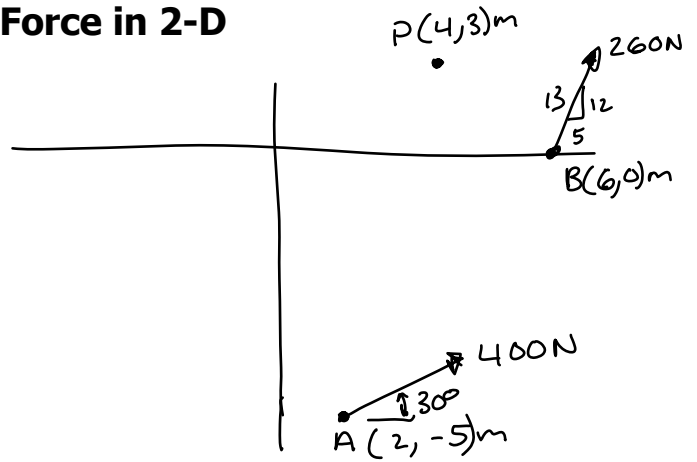


Moments of Force in 2-D

Problem Statement: Determine the resultant moment of force about point P.



1.) Draw the FBD.

Given

2.) Resolve each force into components.

$$F_{2600x} = (2600\text{N})\left(\frac{5}{13}\right) = \underline{1000\text{N}}$$

$$F_{2600y} = (2600\text{N})\left(\frac{12}{13}\right) = \underline{2400\text{N}}$$

$$F_{4000x} = (4000\text{N})(\cos 30^\circ) = \underline{3464\text{N}}$$

$$F_{4000y} = (4000\text{N})(\sin 30^\circ) = \underline{2000\text{N}}$$

3.) Determine the moment arms for each component.

$$d_{2600x} = 3\text{m}$$

$$d_{2600y} = 2\text{m}$$

$$d_{4000x} = 8\text{m}$$

$$d_{4000y} = 2\text{m}$$

4.) Determine the resultant moment.

$$\begin{aligned} \rightarrow M_{RP} = \sum M_P &= (1000\text{N})(3\text{m}) + (2400\text{N})(2\text{m}) \\ &+ (3464\text{N})(8\text{m}) - (2000\text{N})(2\text{m}) \end{aligned}$$

$$\boxed{M_{RP} = 3,151\text{ N}\cdot\text{m}}$$