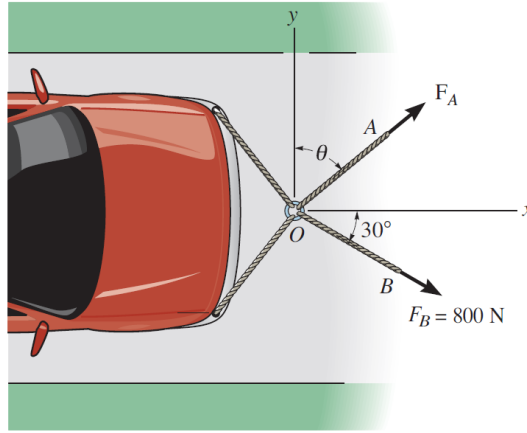


Problem 2-26

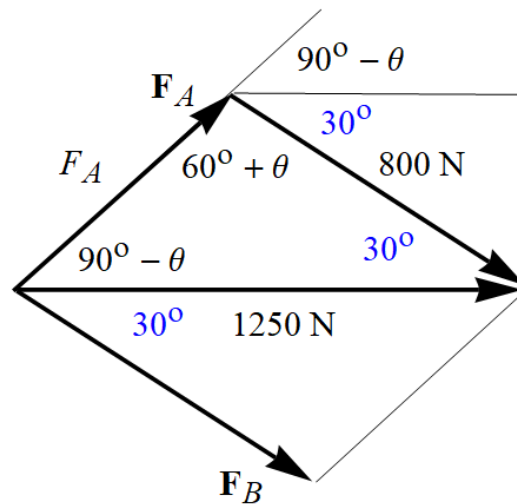
Determine the magnitude and direction θ of \mathbf{F}_A so that the resultant force is directed along the positive x axis and has a magnitude of 1250 N.



Probs. 2-26/27

Solution

Draw the triangle that \mathbf{F}_A and \mathbf{F}_B and their resultant make.



Use the law of cosines to determine F_A .

$$F_A^2 = 1250^2 + 800^2 - 2(1250)(800) \cos 30^\circ$$

$$F_A = \sqrt{1250^2 + 800^2 - 2(1250)(800) \cos 30^\circ} \text{ N}$$

$$\approx 686 \text{ N}$$

Use the law of sines to determine θ .

$$\frac{F_A}{\sin 30^\circ} = \frac{800 \text{ N}}{\sin(90^\circ - \theta)} \rightarrow \sin(90^\circ - \theta) = \cos \theta = \frac{800 \text{ N}}{F_A} \sin 30^\circ \rightarrow \theta \approx 54.3^\circ$$