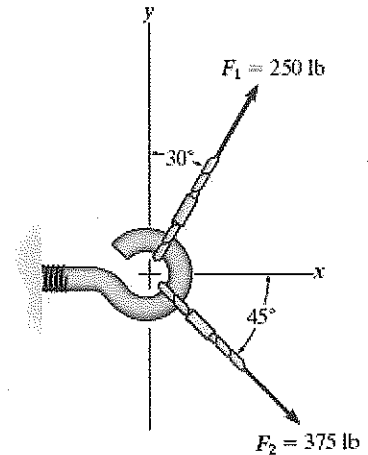


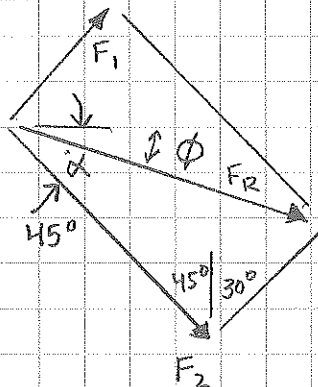
## PROBLEM AP-01

GIVEN:

Determine the magnitude of the resultant force  $F_R = F_1 + F_2$  and its direction, measured counterclockwise from the positive x axis.

REQUIRED:

$$\vec{F}_R = ?$$

SOLUTION:

$$F_R^2 = 250^2 + 375^2 - 2(250)(375)\cos 75^\circ$$

$$F_R = 393.2 \text{ LB}$$

$$\frac{\sin \alpha}{250} = \frac{\sin 75^\circ}{393.2} \quad \alpha = 37.89^\circ$$

$$\phi = 45 - \alpha = 7.1^\circ$$

OR

$$F_{1x} = 250 \sin 30 = 125.0 \rightarrow$$

$$F_{1y} = 250 \cos 30 = 216.5 \uparrow$$

$$F_{2x} = 375 \cos 45 = 265.2 \rightarrow$$

$$F_{2y} = 375 \sin 45 = 265.2 \downarrow$$

$$F_{Rx} = 390.2 \rightarrow$$

$$F_{Ry} = 48.7 \downarrow$$

$$F_R = 393.2 \text{ LB}$$

$$\phi = \tan^{-1} \left( \frac{48.7}{390.2} \right) = 7.1^\circ$$

$$F_R = 393.2 \text{ LB}$$

$$\rightarrow 7.1^\circ$$