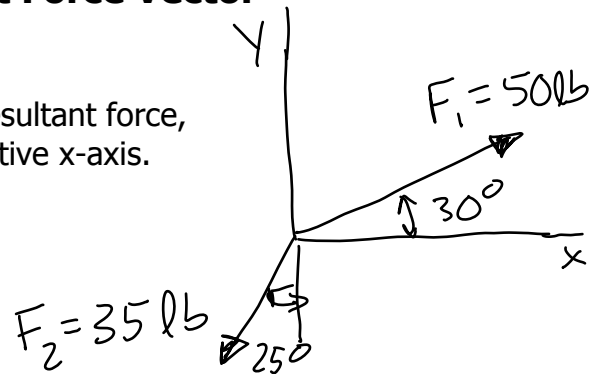
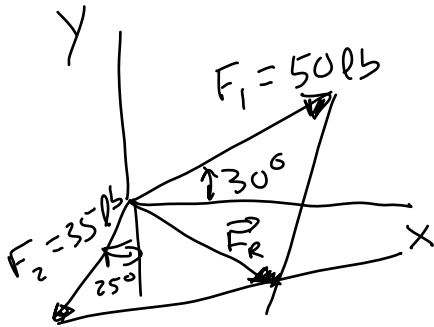


Determining the Resultant Force Vector

Problem Statement: Determine the magnitude of the resultant force, and its direction measured counter-clockwise from the positive x-axis.



1.) Draw and label all forces.



2.) Resolve each force into x and y components.

$$F_{1x} = (50 \text{ lb}) \cos(30^\circ) = 43.3 \text{ lb}$$

$$F_{1y} = (50 \text{ lb}) \sin(30^\circ) = 25 \text{ lb}$$

$$F_{2x} = -(35 \text{ lb}) \sin(25^\circ) = -14.8 \text{ lb}$$

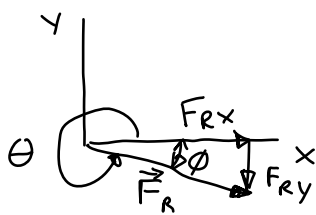
$$F_{2y} = -(35 \text{ lb}) \cos(25^\circ) = -31.7 \text{ lb}$$

3.) Determine F_{Rx} and F_{Ry} .

$$\rightarrow F_{Rx} = \sum F_x = 43.3 \text{ lb} - 14.8 \text{ lb} = 28.5 \text{ lb}$$

$$+\uparrow \sum F_{Ry} = \sum F_y = 25 \text{ lb} - 31.7 \text{ lb} = -6.7 \text{ lb}$$

4.) Solve for the resultant force its angle.



$$\tan \phi = \frac{6.7 \text{ lb}}{28.5 \text{ lb}} \quad \phi = 13.2^\circ$$

$$\theta = 360^\circ - 13.2^\circ = 346.8^\circ$$

$$F_R = \sqrt{(28.5 \text{ lb})^2 + (-6.7 \text{ lb})^2}$$

$$F_R = 29.3 \text{ lb}$$

