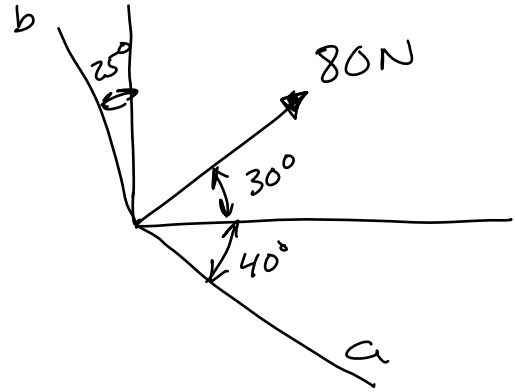
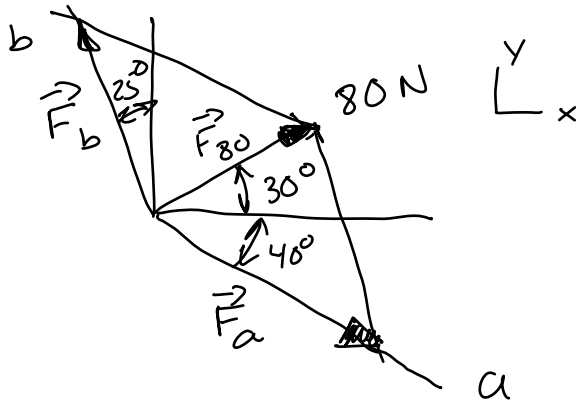


Resolving a vector in components along non-orthogonal axes

Problem Statement: Resolve the force into components along the a and b axes.



1.) Draw and label all forces.



2.) Determine the x and y components of each force.

$$F_{ax} = F_a \cos 40^\circ$$

$$F_{ay} = -F_a \sin 40^\circ$$

$$F_{bx} = -F_b \sin 25^\circ$$

$$F_{by} = F_b \cos 25^\circ$$

$$F_{80x} = (80\text{N}) \cos 30^\circ \\ = 69.3\text{N}$$

$$F_{80y} = (80\text{N}) \sin 30^\circ \\ = 40\text{N}$$

3.) Sum forces in the x and y directions.

$$F_a \cos 40^\circ - F_b \sin 25^\circ = 69.3\text{N}$$

$$-F_a \sin 40^\circ + F_b \cos 25^\circ = 40\text{N}$$

4.) Solve for the force components along axes a and b

2 Equations, 2 Unknowns

$$F_a = 188.9\text{N}, F_b = 178.2\text{N}$$