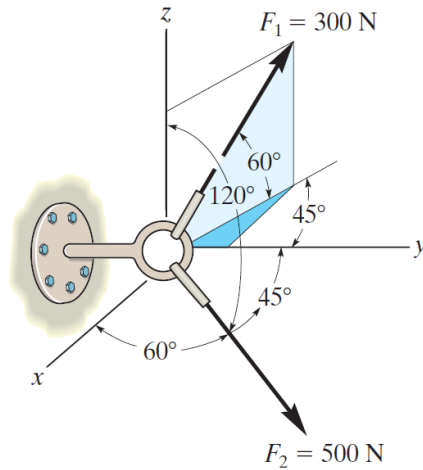


## Problem 2-66

Determine the coordinate direction angles of  $\mathbf{F}_1$ .



**Probs. 2-65/66**

### Solution

Write  $\mathbf{F}_1$  in component form.

$$\mathbf{F}_1 = 300 \langle -\cos 60^\circ \sin 45^\circ, \cos 60^\circ \cos 45^\circ, \sin 60^\circ \rangle \text{ N}$$

Divide  $\mathbf{F}_1$  by its magnitude to get a unit vector in the same direction.

$$\frac{\mathbf{F}_1}{|\mathbf{F}_1|} = \langle -\cos 60^\circ \sin 45^\circ, \cos 60^\circ \cos 45^\circ, \sin 60^\circ \rangle$$

Its direction angles are therefore

$$\begin{cases} \cos \alpha_1 = -\cos 60^\circ \sin 45^\circ \\ \cos \beta_1 = \cos 60^\circ \cos 45^\circ \\ \cos \gamma_1 = \sin 60^\circ \end{cases} \rightarrow \begin{cases} \alpha_1 \approx 111^\circ \\ \beta_1 \approx 69.3^\circ \\ \gamma_1 = 30.0^\circ \end{cases}$$