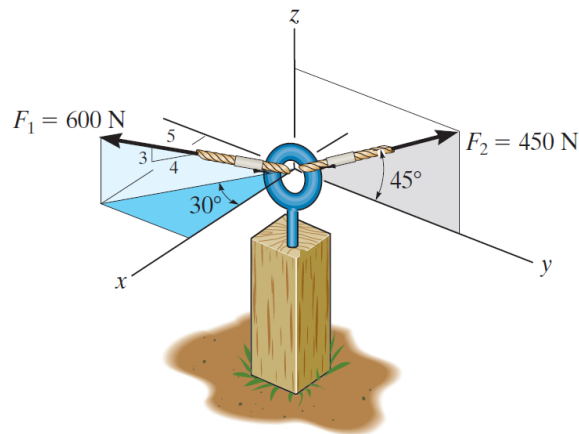


Problem R2-6

Express \mathbf{F}_1 and \mathbf{F}_2 as Cartesian vectors.



Prob. R2-6

Solution

Begin by finding α , the angle that \mathbf{F}_1 is above the xy -plane.

$$\tan \alpha = \frac{3}{4} \quad \rightarrow \quad \alpha = \tan^{-1} \left(\frac{3}{4} \right) \approx 36.9^\circ$$

Write each of the forces in component form.

$$\mathbf{F}_1 = 600 \langle \cos \alpha \cos 30^\circ, -\cos \alpha \sin 30^\circ, \sin \alpha \rangle \text{ N} = 600 \left\langle \frac{4}{5} \cos 30^\circ, -\frac{4}{5} \sin 30^\circ, \frac{3}{5} \right\rangle \text{ N} \approx \langle 416, -240, 360 \rangle \text{ N}$$

$$\mathbf{F}_2 = 450 \langle 0, \cos 45^\circ, \sin 45^\circ \rangle \text{ N} \approx \langle 0, 318, 318 \rangle \text{ N}$$