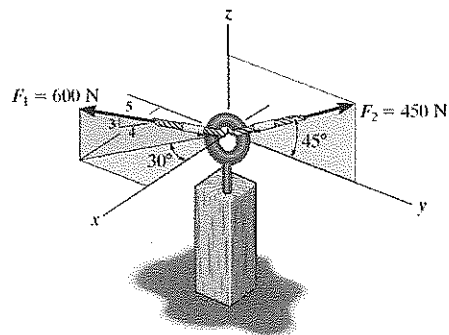


SOLUTIONS

PROBLEM AP-06GIVEN:

Determine the magnitude and coordinate direction angles of the resultant force acting on the eyebolt.

REQUIRED:

$$|F_R|$$

$$\theta_x, \theta_y, \theta_z$$

SOLUTION:

$$\vec{F}_1 = \left(\frac{4}{5}\right) 600 \cos 30^\circ (+\hat{i}) + \left(\frac{4}{5}\right) 600 \sin 30^\circ (-\hat{j}) + \left(\frac{3}{5}\right) 600 (+\hat{k})$$

$$\vec{F}_2 = 0 (\hat{i}) + 450 \cos 45^\circ (+\hat{j}) + 450 \sin 45^\circ (+\hat{k})$$

$$\vec{F}_R = \vec{F}_1 + \vec{F}_2 = \{415.7 \hat{i} + 78.2 \hat{j} + 678.2 \hat{k}\} \text{ N}$$

$$F_R = \sqrt{\Sigma^2} = 799 \text{ N}$$

$$\cos \theta_x = \frac{415.7}{799} \quad \theta_x = 58.7^\circ \quad \theta_y = 84.4^\circ \quad \theta_z = 32.0^\circ$$

$$F_R = 799 \text{ N}$$

$$\theta_x = 59^\circ$$

$$\theta_y = 84^\circ$$

$$\theta_z = 32^\circ$$