Express each force acting on the pipe in Cartesian vector form.
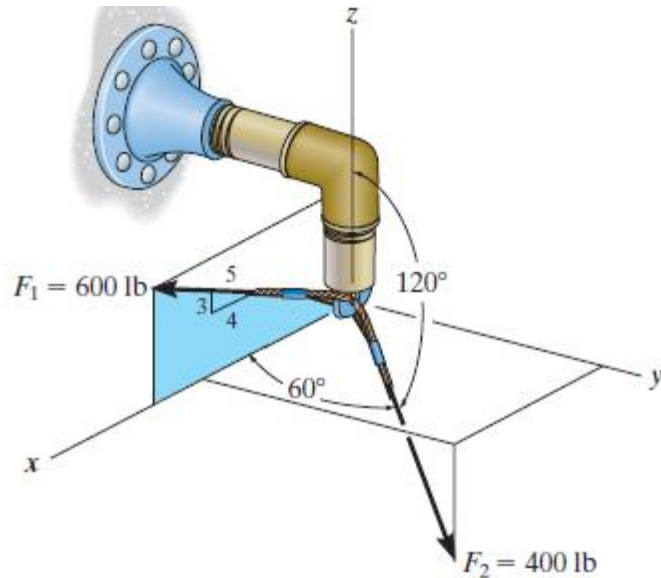
Rectangular Components: Since $\cos^2 \alpha_2 + \cos^2 \beta_2 + \cos^2 \gamma_2 = 1$, then $\cos \beta_2 = \pm\sqrt{1 - \cos^2 60° - \cos^2 120°} = \pm 0.7071$.
However, it is required that $\beta_2 > 90°$, thus, $\beta_2 = \cos^{-1}(0.7071) = 45°$. By resolving F_1 and F_2 into their x, y, and z components, as shown in Figs. a and b, respectively, F_1 and F_2, can be expressed in Cartesian vector form, as

$$F_1 = 600\left(\frac{4}{5}\right)(+i) + 0j + 600\left(\frac{3}{5}\right)(+k)$$

$$= [480i + 360k]N \qquad\qquad\qquad \text{Ans.}$$

$$F_2 = 400\cos 60°i + 400\cos 45°j + 400\cos 120° k$$

$$= [200i + 283j - 200k]N \qquad\qquad\qquad \text{Ans.}$$