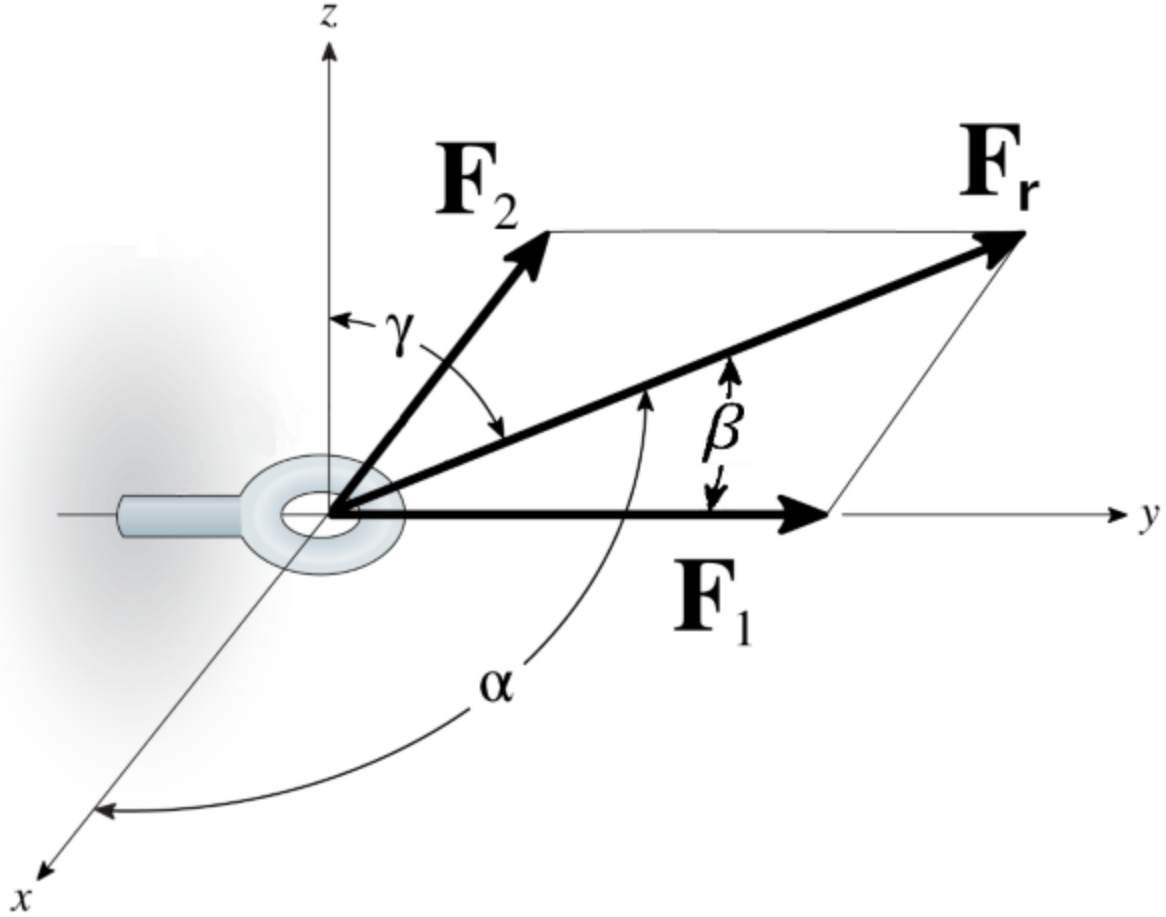
21-5-2-5-GD-001



Two forces $F_1 = F_1$ N and $F_2 = F_2$ N act on a metal loop as shown. The magnitude of their resultant force is F_R N. What are the coordinate direction angles of F_R?

(Pay attention to signs)

given F_1, F_2, F_R

Find α, β, γ

$$\vec{u} = \frac{\vec{F}_R}{F_R} = \frac{F_{Rx}}{F_R}\hat{i} + \frac{F_{Ry}}{F_R}\hat{j} + \frac{F_{Rz}}{F_R}\hat{k}$$

$$= -\frac{F_2}{F_R}\hat{i} + \frac{F_1}{F_R}\hat{j} + 0$$

$\alpha = \cos^{-1}(-F_2/F_R)$ $\beta = \cos^{-1}(F_1/F_R)$

$\gamma = \cos^{-1}(0) = 90°$