

47. (a) We take a torque that tends to cause a counterclockwise rotation from rest to be positive and a torque tending to cause a clockwise rotation to be negative. Thus, a positive torque of magnitude $r_1 F_1 \sin \theta_1$ is associated with \vec{F}_1 and a negative torque of magnitude $r_2 F_2 \sin \theta_2$ is associated with \vec{F}_2 . The net torque is consequently

$$\tau = r_1 F_1 \sin \theta_1 - r_2 F_2 \sin \theta_2 .$$

- (b) Substituting the given values, we obtain

$$\tau = (1.30 \text{ m})(4.20 \text{ N}) \sin 75^\circ - (2.15 \text{ m})(4.90 \text{ N}) \sin 60^\circ = -3.85 \text{ N}\cdot\text{m} .$$