

HW 9-4 Soln)

In general, $\tau = rF\sin\theta_{r,F}$. Each r vector is measured from Point A to the point of application of the force. The angle is that between the r vector and the force vector. Assign torques out of the page (those that would tend to make the object accelerate CCW) a positive sign and torques into the page (CW) a negative sign. The '?' indicates that the angle is undefinable, since $\mathbf{r}$'s direction is not defined.

a)

$$\Sigma\tau_n = 0 \times 50 \times \sin? + 3 \times 30 \times \sin 60^\circ - 6 \times 20 \times \sin 20^\circ = +36.9 \text{ Nm}$$

b)

$$\Sigma\tau_n = 3 \times 50 \times \sin 45^\circ + 0 \times 25 \times \sin? - 3 \times 20 \times \sin 20^\circ = +85.6 \text{ Nm}$$