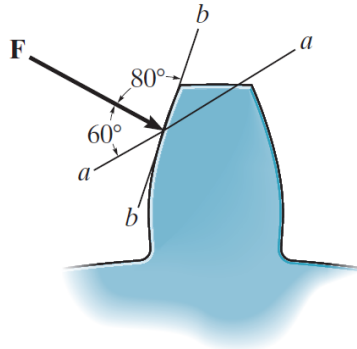


Problem 2-13

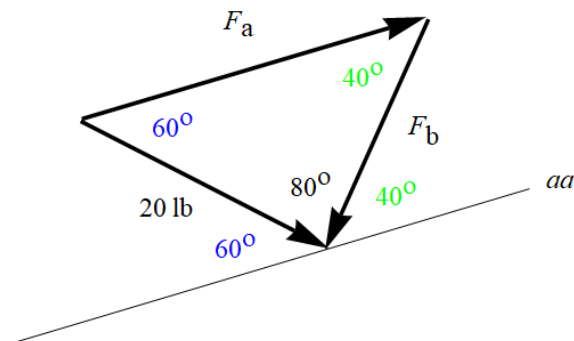
The force acting on the gear tooth is $F = 20$ lb. Resolve this force into two components acting along the lines aa and bb .



Probs. 2–13/14

Solution

Draw the triangle that the force and its components along aa and bb form. Use geometry to determine the angles.



Use the law of sines to determine the components.

$$\frac{20 \text{ lb}}{\sin 40^\circ} = \frac{F_a}{\sin 80^\circ} \quad \rightarrow \quad F_a = \frac{20 \text{ lb}}{\sin 40^\circ} \sin 80^\circ \approx 30.6 \text{ lb}$$

$$\frac{20 \text{ lb}}{\sin 40^\circ} = \frac{F_b}{\sin 60^\circ} \quad \rightarrow \quad F_b = \frac{20 \text{ lb}}{\sin 40^\circ} \sin 60^\circ \approx 26.9 \text{ lb}$$