# Chapter 9
## Example Problems

1. A massless box is being pushed on by three people. The first person pushes with a force of 6.0 N at an angle of 30°, relative to the positive x-axis. The second person pushes straight down on the box with a force of 9.0 N and the third person pushes up on the box with a force of 18.0 N at an angle of 210°, relative to the positive x-axis. If these are the only forces acting on this box, is the box in equilibrium?

2. A 2.0 m long rod sits on the x-axis of a coordinate system. One end of the rod is attached to a hinge at x = 0.0 m. A force of 10.0 N is applied perpendicular to the other end of the rod.
    a. What is the torque on the rod?
    b. If the force was applied half way down the rod and at an angle of 30.0° relative to the rod, what would be the torque on the rod now?

3. The figure shows a safe of mass $M$ = 430 kg hanging by a rope of negligible mass from a boom ($a$ = 1.9 m and $b$ = 2.5 m) that consists of a uniform hinged beam of mass $m$ = 85 kg and a horizontal cable of negligible mass.

   a. What is the tension in the rope?
   b. What is the tension in the cable?
   c. Find the magnitude the net force on the beam from the hinge.