1. State the general equations of equilibrium for a rigid body and explain what is meant when these two equations are said to be necessary and sufficient for equilibrium.

2. List the most commonly used set of three equations of equilibrium that are used in two dimensions. List the alternative sets of equations of equilibrium that can also be used in two dimensions.

3. Refer to the figure below. Neglect the weight of the member.

   a. Draw a complete FBD of the member.
   b. Determine the reaction(s) at the wall A
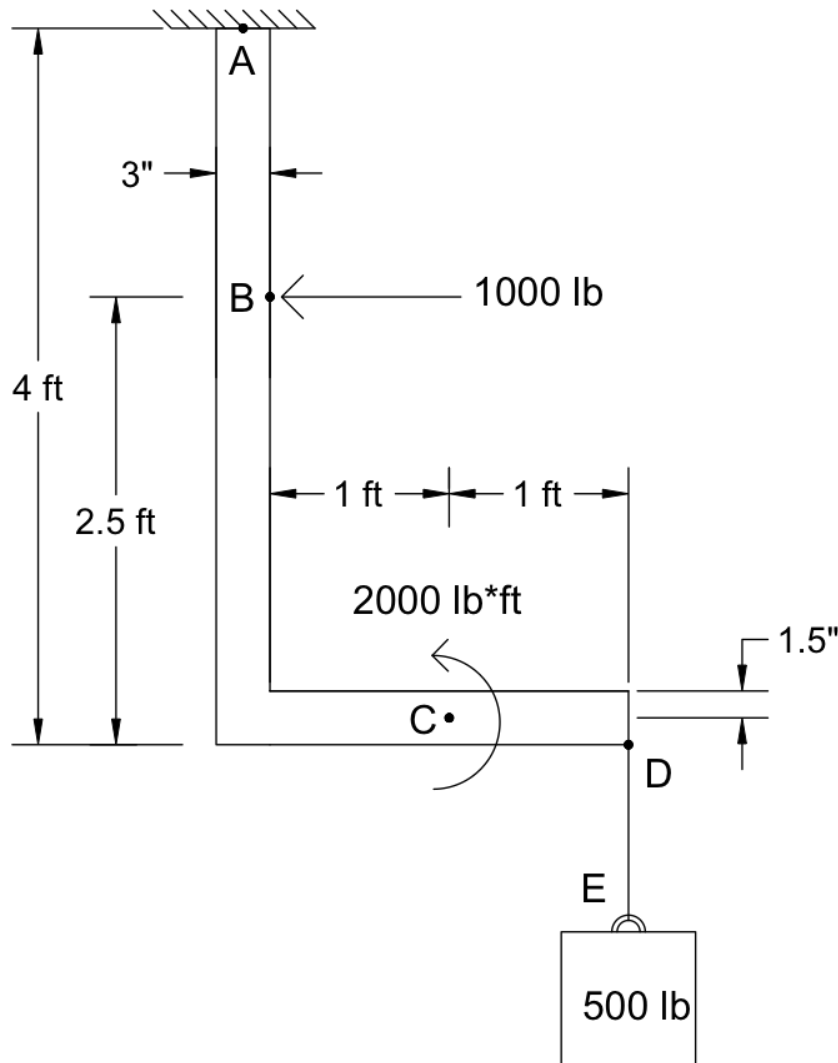
4. Refer to the figure below. The beam is supported by a pin at A and a roller at B. The beam has a mass of 40 kg and you can assume that the center of mass of the beam is located at a distance of 3 m from A.

    a. Draw a complete FBD of the beam.
    b. Determine the reaction(s) on the beam caused by the pin at A
    c. Determine the reaction(s) on the beam caused by the roller at B
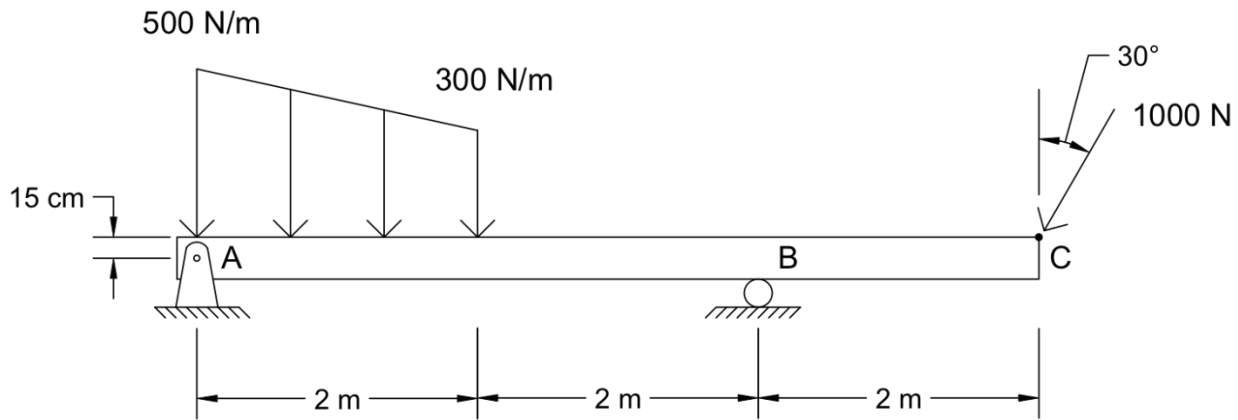
5. Refer to the figure below. The beam is supported by a pin at A and a spring at C. The spring is attached to a rocker at D. Neglect the weight of the beam.

    a. Draw a complete FBD of the rocker at D.
    b. Draw a complete FBD of the beam.
    c. If the spring can support a maximum force of 560 lb., determine the maximum distance d of the 750 lb. concentrated load.
    d. Using the distance found in part c, determine the reaction(s) on the beam caused by the pin at A.