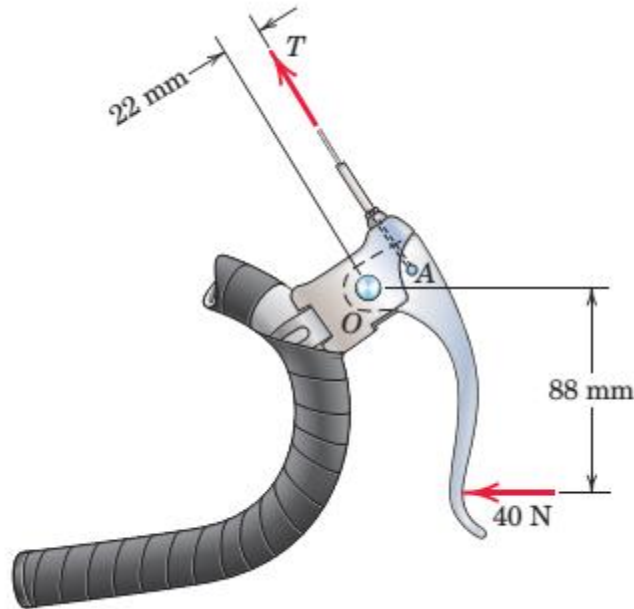**Problem 1.** A bicyclist applies a 40-N force to the brake lever of her bicycle as shown. Determine the corresponding tension T transmitted to the brake cable. Neglect friction at the pivot O.


Problem 2. The asymmetric simple truss is loaded as shown. Determine the reactions at A and D. Neglect the weight of the structure compared with the applied loads. Is knowledge of the size of the structure necessary?
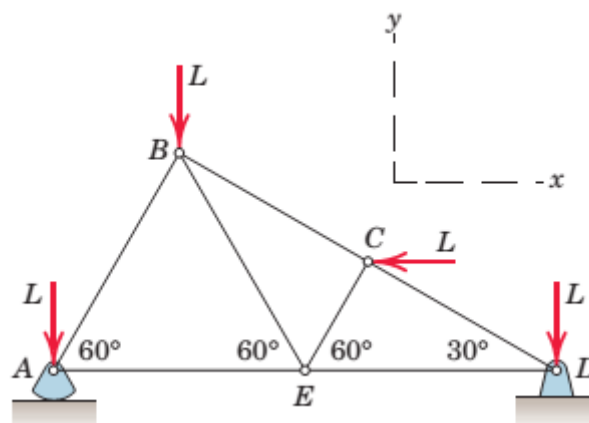
Problem 3. The uniform slender bar of length 2r and mass m rests against the circular surface as shown. Determine the normal force at the small roller A and the magnitude of the ideal pivot reaction at O.
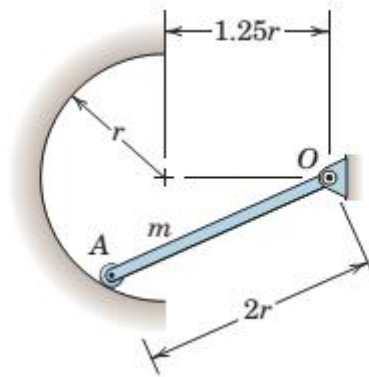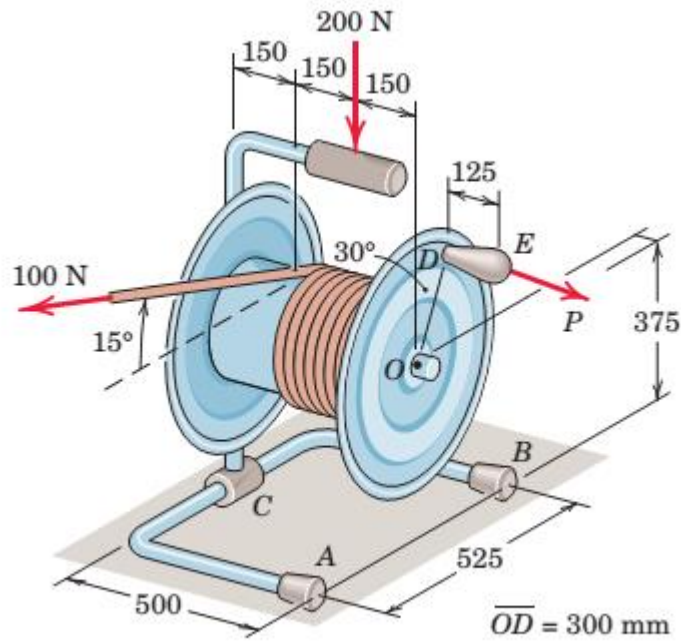

Problem 4. The two uniform rectangular plates each weighing 800 lb are freely hinged about their common edge and suspended by the central cable and four symmetrical corner cables. Calculate the tension Tin each of the corner cables and the tension in the center cable.
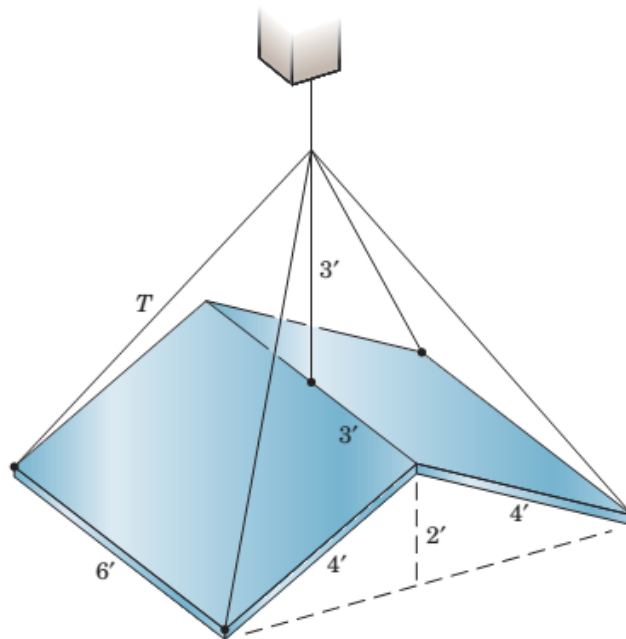
Problem 5. The portable reel is used to wind up and store an air hose. The tension in the hose is 100 N and a vertical 200-N force is applied to the handle in order to steady the reel frame. Determine the minimum force P which must be applied perpendicular to the handle D E and the vertical components of the force reactions at the feet A, B, and C. The diameter of the coil of reeled hose is 300 mm, and the weight of the loaded reel and its frame may be neglected. Note that force P is perpendicular to O D. State any assumptions.

Dimensions in millimeters