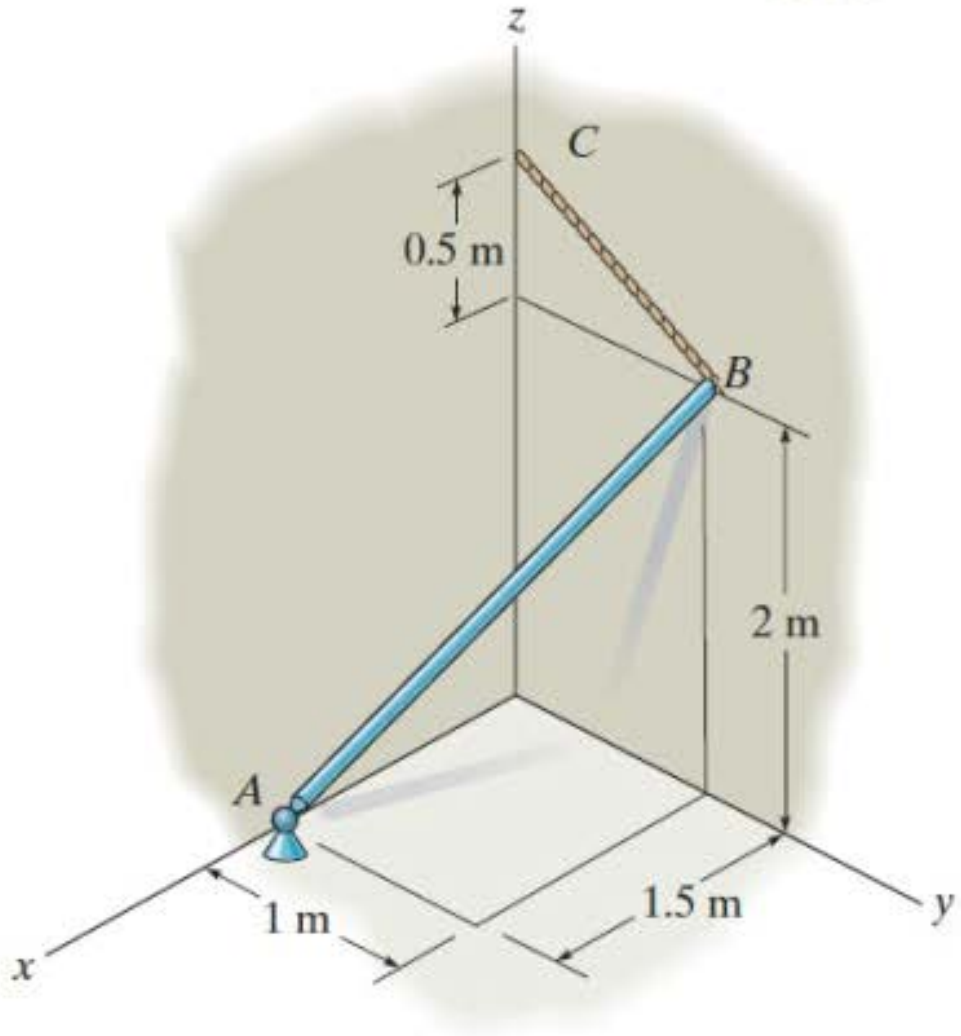
ME 201 STATICS

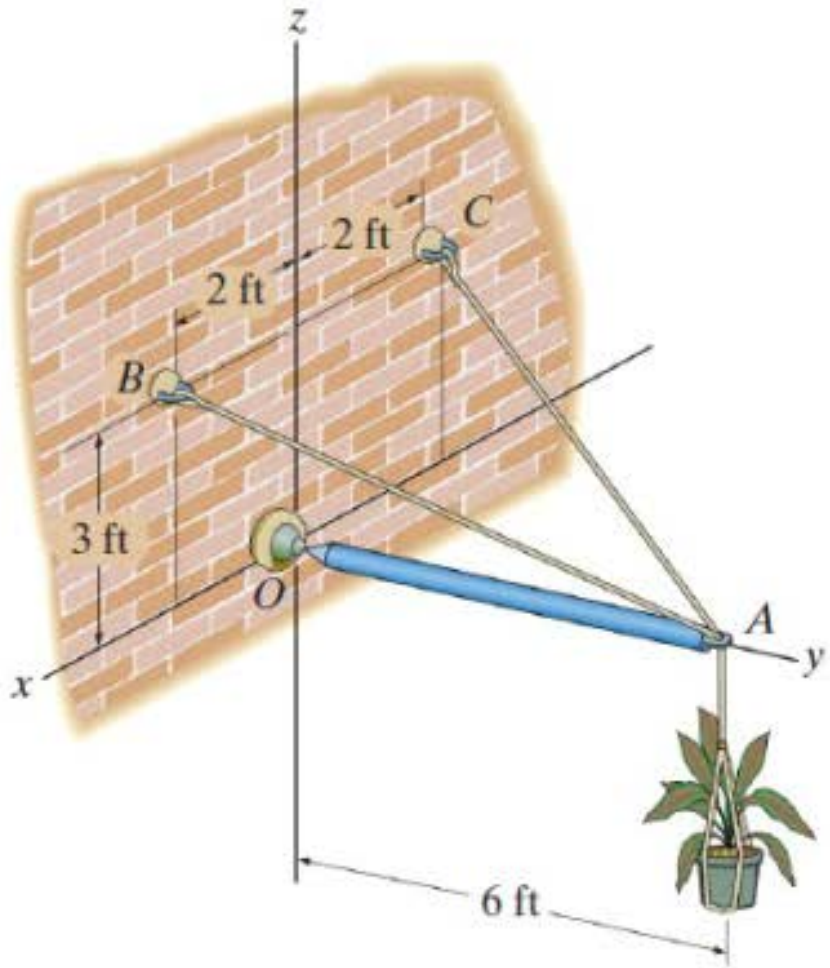
PROBLEM HOUR IV

3D EQUILIBRIUM

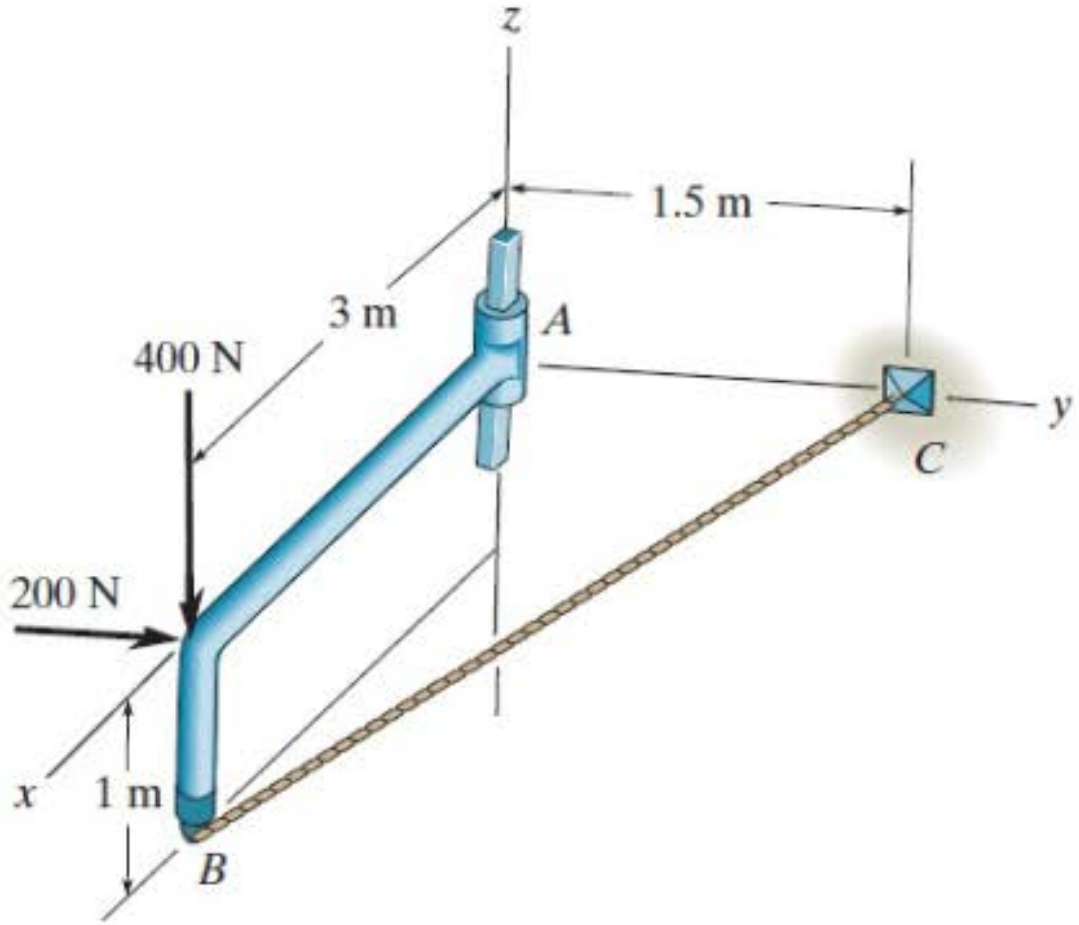
Q1) The smooth uniform rod AB is supported by a ball-and-socket joint at A, the wall at B, and cable BC. Determine the components of reaction at A, the tension in the cable, and the normal reaction at B if the rod has a mass of 20 kg.



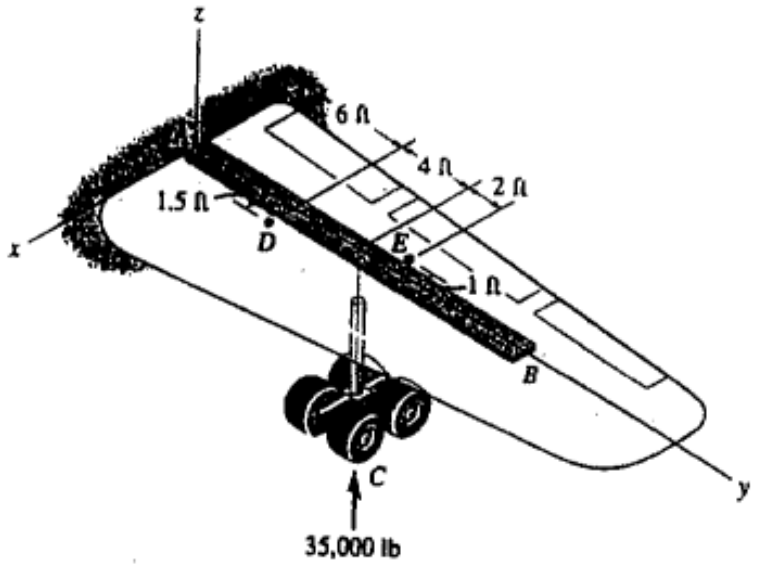
Q2) The boom is used to support the 75-lb flowerpot Determine the tension developed in wires AB and AC.



Q3) Member AB is supported by a cable BC and at A by a *square* rod which fits loosely through the square hole in the collar fixed to the member as shown. Determine the components of reaction at A and the tension in the cable needed to hold the rod in equilibrium.



Q4) The main beam *AB* supports the load on the wing of the airplane. The loads consist of the wheel reaction of 35,000 lb at *C*, the 1200-lb weight of fuel in the tank of the wing, having a center of gravity at *D*, and the 400-lb weight of the wing, having a center of gravity at *E*. If it is fixed to the fuselage at *A*, determine the resultant internal loadings on the beam at this point. Assume that the wing does not transfer any of the loads to the fuselage, except through the beam.



Q5) A hand crank that is used in a press has the dimensions shown. Determine the resultant internal loadings acting on the cross section at *A* if a vertical force of 50 lb is applied to the handle as shown. Assume the crank is fixed to the shaft at *B*.

