

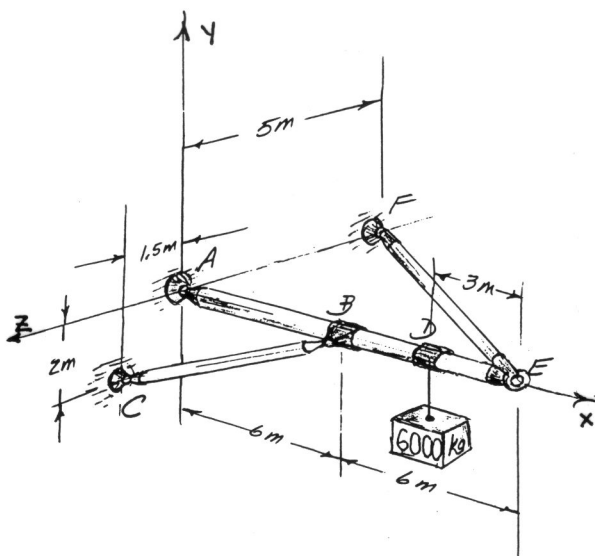
CIV100F – MECHANICS ONLINE

Assignment No. 5

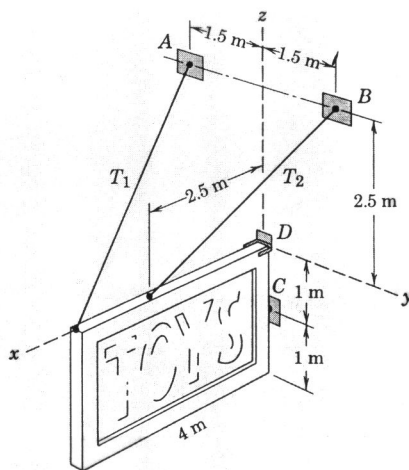
Due: As indicated in Quercus

Material Covered: Textbook – Chapter 5

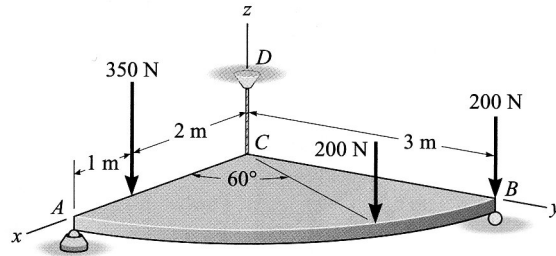
1. A lifting device consists of a boom AE supported by a ball-and-socket at A and by two pin-ended members BC and EF . The connecting collar at B cannot slide along the boom. The lifting device supports a mass of 6000 kg. Calculate the forces in the members BC and EF . The weights of all members are negligible. (*Final exam, December 2000*)



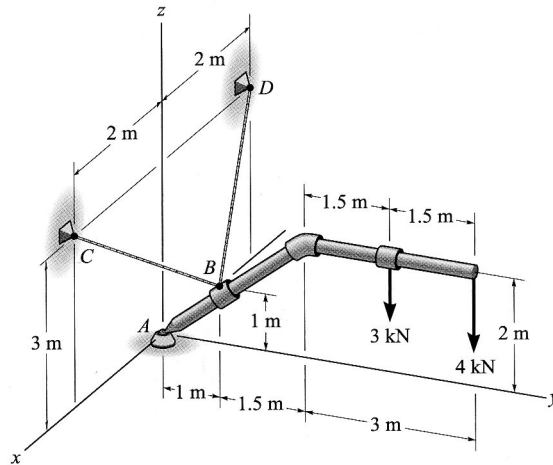
2. A rectangular sign over a store has a mass of 100 kg, with the centre of mass in the centre of the rectangle. The support against the wall at point C may be treated as a ball-and-socket joint. At corner D support is provided in the y -direction only. Calculate the tensions T_1 and T_2 in the supporting wires, the total force supported at C and the lateral force R supported at D .



3. Determine the force components acting on the ball-and-socket at A , the reaction at the roller B and the tension in the chord CD needed for the equilibrium of the quarter circular plate.



4. The pipe assembly supports the vertical loads shown. Determine the components of reaction at the ball-and-socket joint A and the tension in the supporting cables BC and BD .



5. The boom AC is supported at A by a ball-and-socket joint and by two cables BDC and CE . Cable BDC is continuous and passes over a pulley at D . Calculate the tension in the cables and the components of reaction at A , if the crate has a weight of 80 kN.

