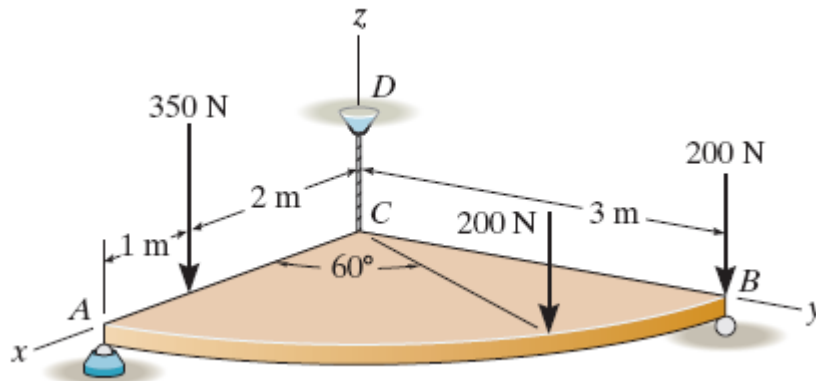


CHAPTER V- EQUILIBRIUM OF A BODY

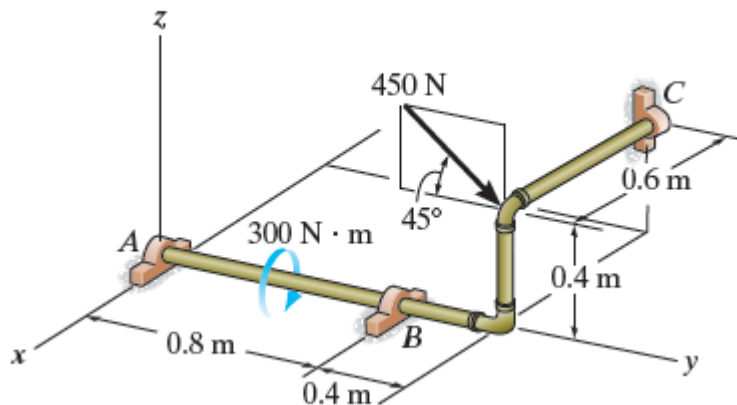
1- Determine the force components acting on the ball-and-socket at A , the reaction at the roller B and the tension on the cord CD needed for equilibrium of the quarter circular plate.

($N_B = 373.21 \text{ N}$, $A_z = 333.33 \text{ N}$, $T_{CD} = 43.5 \text{ N}$)



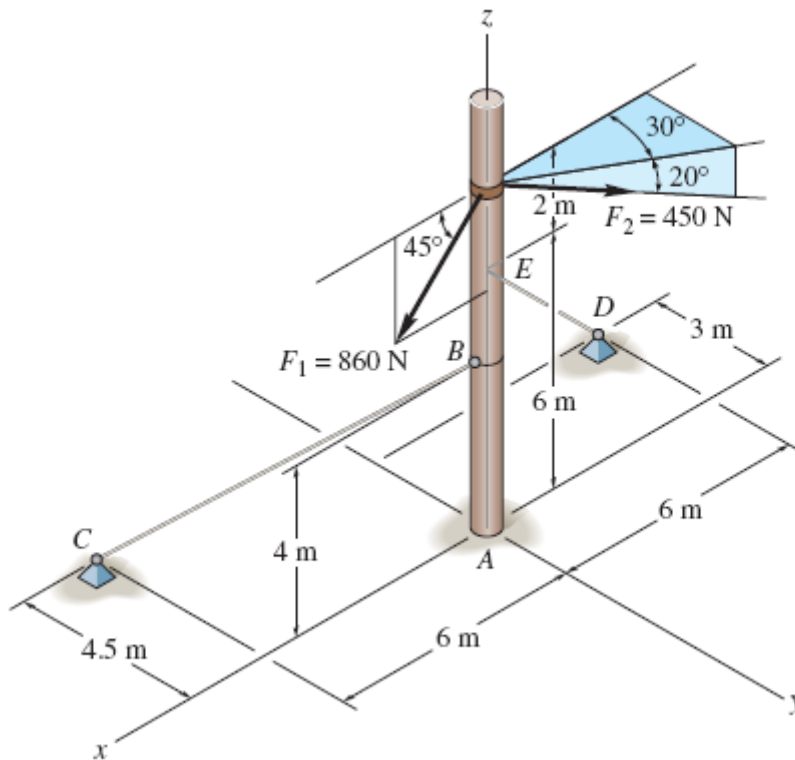
2- Determine the components of reaction acting at the smooth journal bearings A , B , and C .

($C_y = 318 \text{ N}$, $C_z = 500 \text{ N}$, $B_z = 273 \text{ N}$, $B_x = 239 \text{ N}$, $A_z = 90.9$)



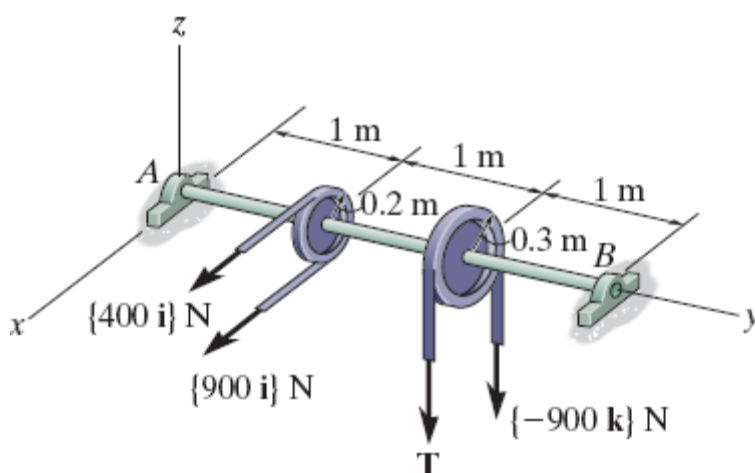
3- The pole is subjected to the two forces shown. Determine the components of reaction of A assuming it to be a ball-and-socket joint. Also, compute the tension in each of the guy wires, BC and ED .

($F_{BC} = 205.09 \text{ N} = 205 \text{ N}$, $F_{ED} = 628.57 \text{ N} = 629 \text{ N}$, $A_x = 32.4 \text{ N}$, $A_y = 107 \text{ N}$, $A_z = 1277.58 \text{ N} = 1.28 \text{ kN}$)



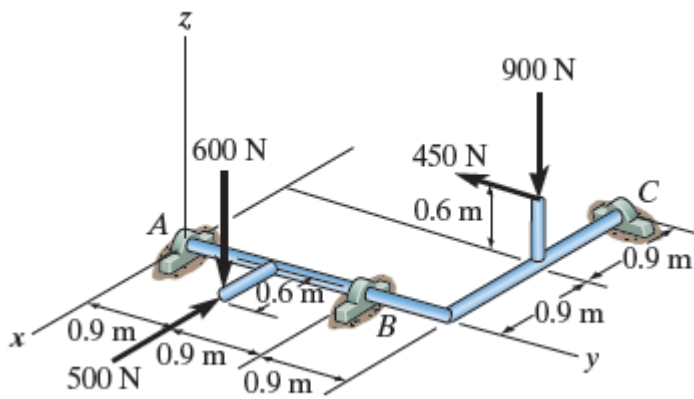
4- If the pulleys are fixed to the shaft, determine the magnitude of tension T and the x , y , z components of reaction at the smooth thrust bearing A and smooth journal bearing B .

($T = 1233.33 \text{ N} = 1.23 \text{ kN}$, $B_x = -433.33 \text{ N} = -433 \text{ N}$, $B_z = 1422.22 \text{ N} = 1.42 \text{ kN}$, $A_x = 866.67 \text{ N} = 867 \text{ N}$, $A_z = 711.11 \text{ N} = 711 \text{ N}$)



5- The shaft is supported by three smooth journal bearings at A , B , and C . Determine the components of reaction at these bearings.

($C_y=450 \text{ N}$, $C_z=250 \text{ N}$, $B_z=1125 \text{ N}$, $A_z=125 \text{ N}$, $B_x=25 \text{ N}$, $A_x=475 \text{ N}$)



6- Determine the x and z components of reaction at the journal bearing A and the tension in cords BC and BD necessary for equilibrium of the rod.

($A_x=0$, $F_{BD}=208$ N, $F_{BC}=792$ N, $(M_A)_z=700$ N.m)

