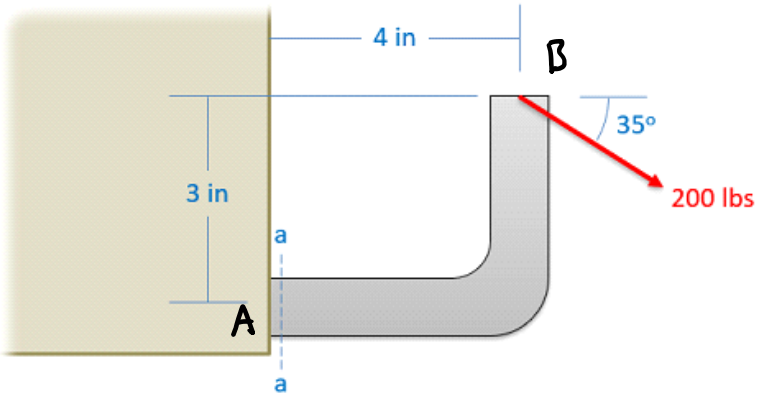
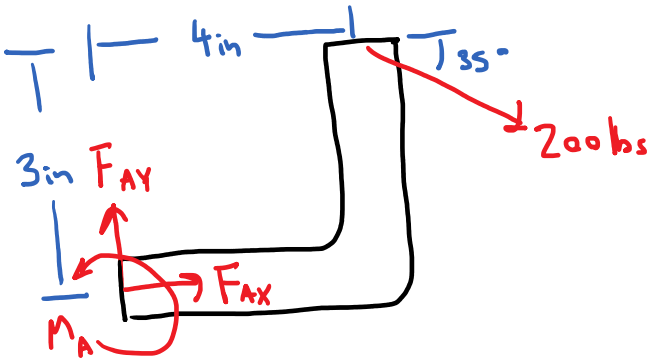
Problem 1

A mounting bracket with the dimensions shown below is subjected to a 200 lb force. Determine all internal forces and moments at cross section a-a.





$$\Sigma F_x = F_{AX} + 200\cos(35) = 0$$

$$\Sigma F_y = F_{AY} - 200\sin(35) = 0$$

$$\Sigma M_A = M_A - 200\cos(35)(3) - 200\sin(35)(4) = 0$$

$$F_{AX} = -200\cos(35) = -163.8 \text{ lbs}$$

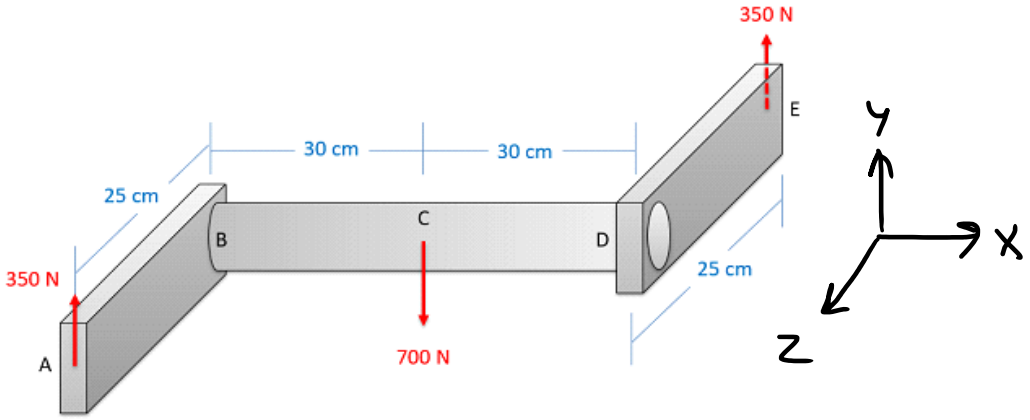
$$F_{AY} = 200\sin(35) = 114.7 \text{ lbs}$$

$$M_A = 200\cos(35)(3) + 200\sin(35)(4) = 950.35 \text{ in lbs}$$

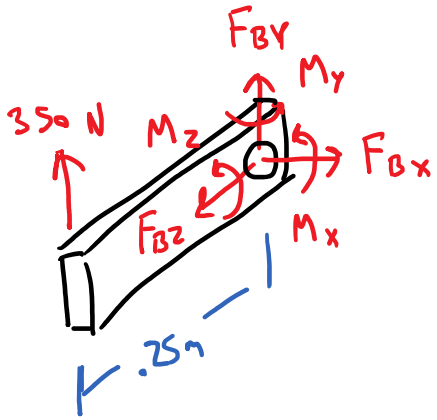
Solution:

Problem 2

A mounting bracket with the dimensions shown below is subjected to a 700 N load and two 350 N reaction forces. Determine all internal forces and moments at points B and C.



At B



$$\Sigma F_x = F_{BX} = 0$$

$$\Sigma F_y = F_{BY} + 350 = 0$$

$$\Sigma F_z = F_{BZ} = 0$$

$$F_{BY} = -350 \text{ N}$$

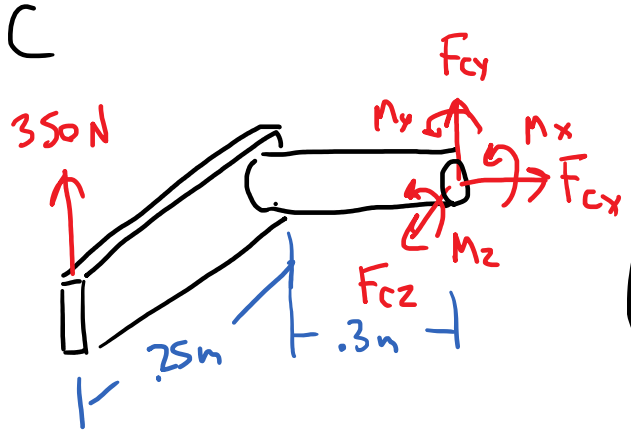
$$\Sigma M_{BX} = M_X - (350)(.25) = 0$$

$$\Sigma M_{BY} = M_Y = 0$$

$$\Sigma M_{BZ} = M_Z = 0$$

$$M_X = 87.5 \text{ Nm}$$

At C



$$\Sigma F_x = F_{cx} = 0$$

$$\Sigma F_y = F_{cy} + 350 = 0$$

$$\Sigma F_z = F_{cz} = 0$$

$$F_{cy} = -350\ N$$

$$\Sigma M_x = M_x - (350)(.25) = 0 \rightarrow M_x = 87.5\ Nm$$

$$\Sigma M_y = M_y = 0 \rightarrow M_y = 0$$

$$\Sigma M_z = M_z - (350)(.3) = 0 \rightarrow M_z = 105\ Nm$$

Solution:

At B