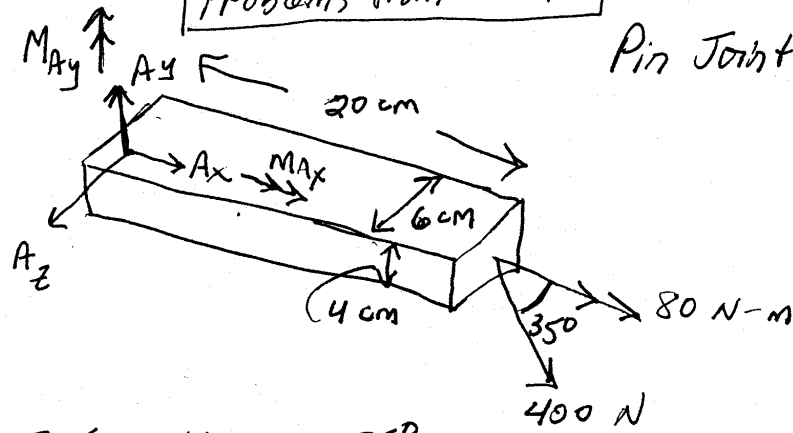


Problems from Lab #2

Pin Joint (No  $M_z$ )



$$\Sigma F_x = 400 \cos 35^\circ + A_x = 0 \Rightarrow A_x = -328 \text{ N}$$

$$\Sigma F_y = A_y = 0 \Rightarrow A_y = 0$$

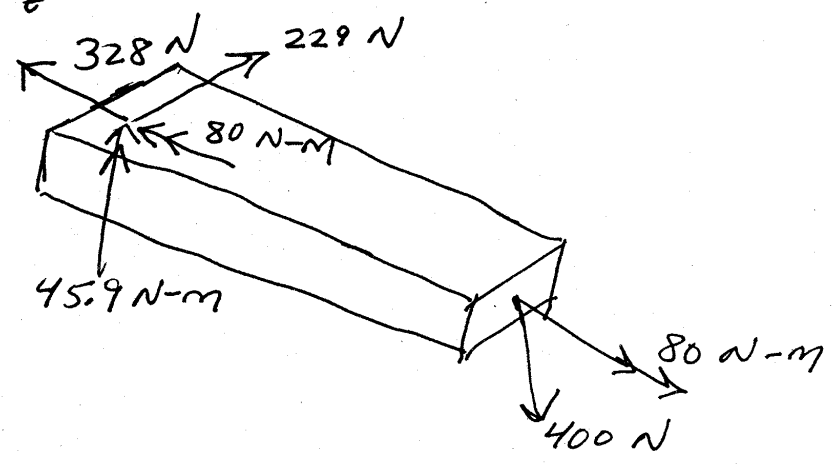
$$\Sigma F_z = 400 \sin 35^\circ + A_z = 0 \Rightarrow A_z = -229 \text{ N}$$

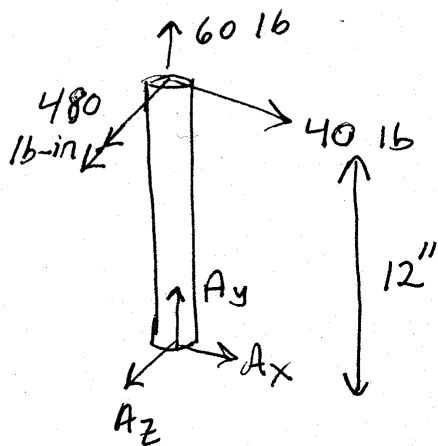
$$\Sigma M/A_x = 80 + M_{A_x} = 0 \Rightarrow M_{A_x} = -80 \text{ N-m}$$

$$\Sigma M/A_y = -400 \sin(35^\circ)(20) + M_{A_y} = 0$$

$$M_{A_y} = 45.9 \text{ N-m}$$

$$\Sigma M/A_z = 0 \checkmark$$





Ball Joint

(No  $M_{Ax}$ ,  $M_{Ay}$ ,  $M_{Az}$ )

$$\Sigma F_x = 40 + A_x = 0$$

$$\Rightarrow A_x = -40 \text{ lb}$$

$$\Sigma F_y = 60 + A_y = 0$$

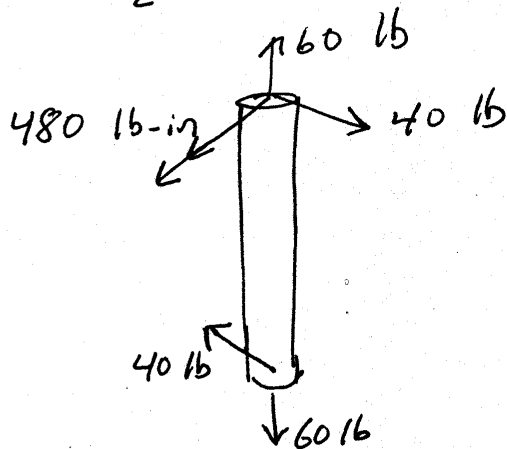
$$A_y = -60 \text{ lb}$$

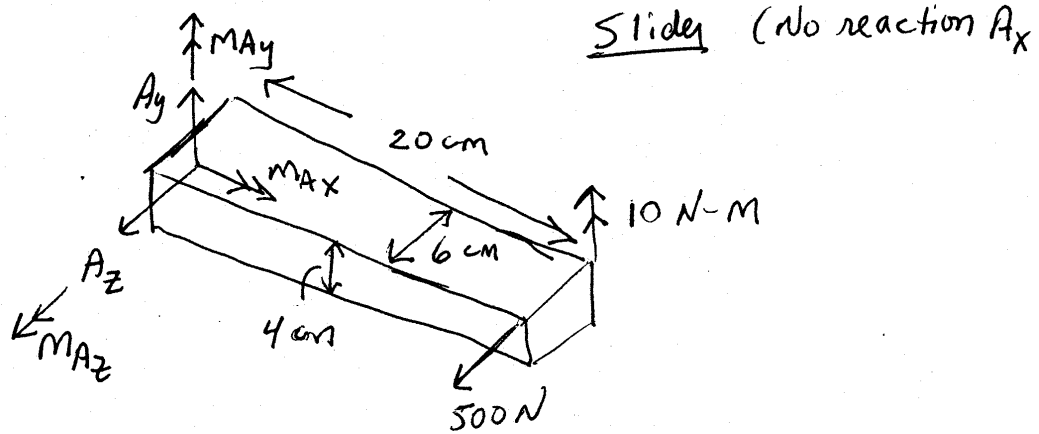
$$\Sigma F_z = 0 \quad \checkmark$$

$$\Sigma M/A_x = 0 \quad \checkmark$$

$$\Sigma M/A_y = 0 \quad \checkmark$$

$$\Sigma M/A_z = -40(12) + 480 = 0 \quad \checkmark$$





$$\Sigma F_x = 0 \checkmark$$

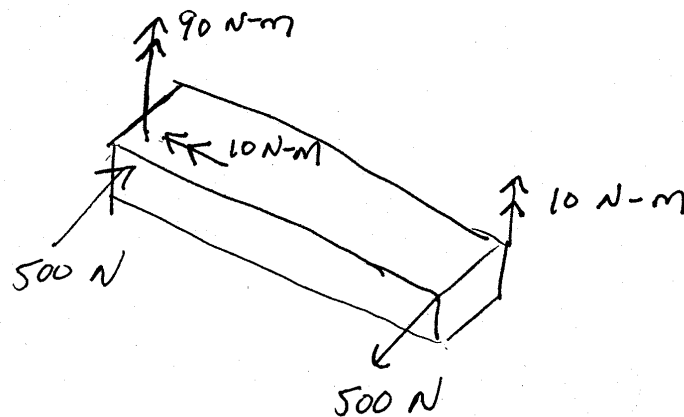
$$\Sigma F_y = A_y = 0 \Rightarrow A_y = 0$$

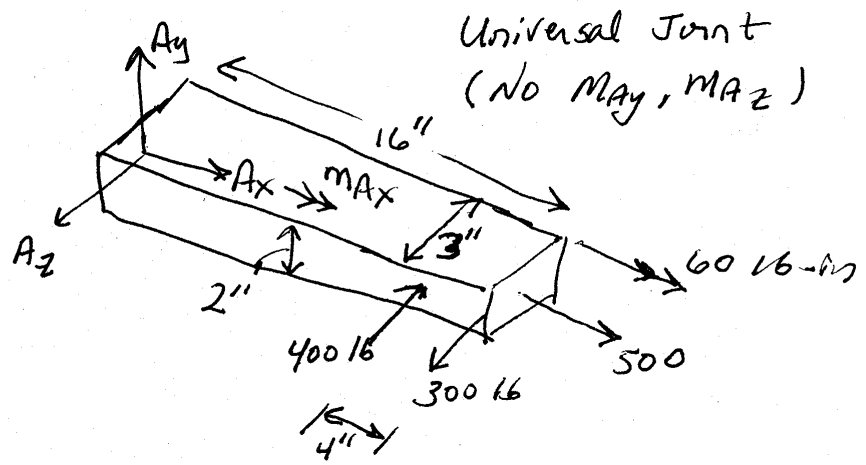
$$\Sigma F_z = 500 + A_z = 0 \Rightarrow A_z = -500 \text{ N}$$

$$\Sigma M/A_x = M_{Ax} + 500(0.2) = 0 \Rightarrow M_{Ax} = -10 \text{ N-m}$$

$$\Sigma M/A_y = 10 + M_{Ay} - 500(0.2) = 0 \Rightarrow M_{Ay} = 90 \text{ N-m}$$

$$\Sigma M/A_z = M_{Az} = 0 \Rightarrow M_{Az} = 0$$





$$\Sigma F_x = 500 + A_x = 0 \Rightarrow A_x = -500 \text{ lb}$$

$$\Sigma F_y = A_y = 0 \Rightarrow A_y = 0$$

$$\Sigma F_z = 300 - 400 + A_z = 0 \Rightarrow A_z = 100 \text{ lb}$$

$$\Sigma M/A_x = 60 + M_{Ax} = 0 \Rightarrow M_{Ax} = -60 \text{ lb-in}$$

$$\Sigma M/A_y = -300(16) + 400(12) = 0 \quad \checkmark$$

$$\Sigma M/A_z = 0 \quad \checkmark$$

