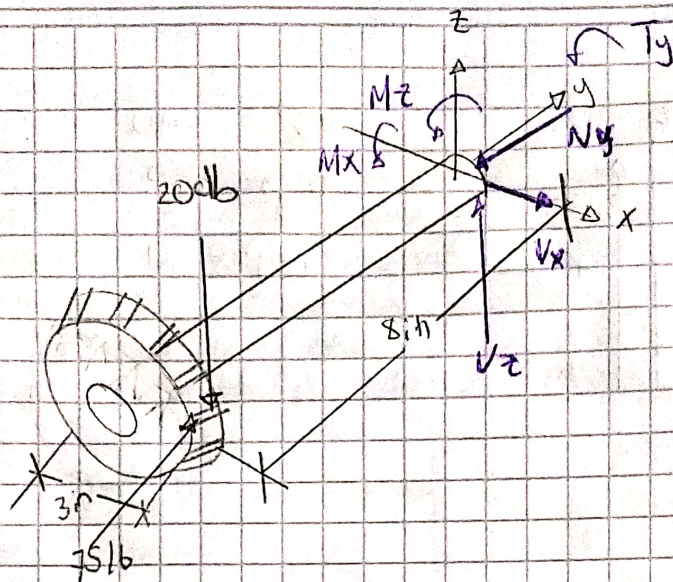


4.



$$\sum F_x = 0$$

$$V_x - 125 = 0 \rightarrow V_x = 125 \text{ lb.}$$

$$\sum F_y = 0$$

$$75 - V_y = 0 \rightarrow V_y = 75 \text{ lb.}$$

$$\sum F_z = 0$$

$$V_z - 200 = 0 \rightarrow V_z = 200 \text{ lb.}$$

$$\sum M_x = 0$$

$$-M_x + 200(8) = 0 \rightarrow M_x = 1600 \text{ [lb-in]}$$

$$\sum M_y = 0$$

$$-T_y - 200(3) = 0 \rightarrow T_y = 600 \text{ [lb-in]}$$

$$\sum M_z = 0 \quad M_z + 75(3) - 125(8) = 0 \rightarrow M_z = 775 \text{ [lb-in]}$$

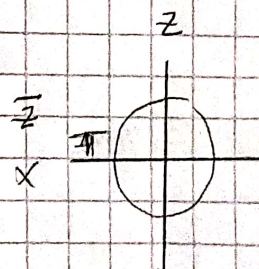
$$D = 1 \text{ in} \rightarrow R = 0.5 \text{ in}$$

$$A = \pi (0.5)^2 = 0.7854 \text{ in}^2$$

$$J = \frac{\pi (0.5)^4}{2} = 0.098175 \text{ in}^4$$

$$I = \frac{\pi (0.5)^4}{4} = 0.049089 \text{ in}^4$$

$$Q_x = \frac{4(0.5)}{3\pi} \cdot \frac{1}{2} \cdot \pi (0.5)^2 = 0.08333 \text{ in}^3$$

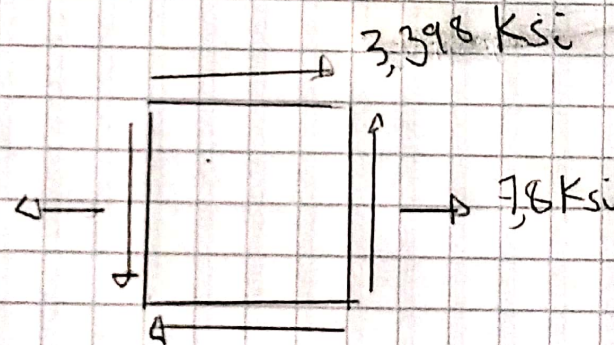


$$\sigma_{By} = \frac{M_z C}{I} - \frac{P_y}{A} = \frac{775(0,5)}{0,049089} - \frac{75}{0,7854} = +7,8 \text{ ksi}$$

$$(\tau_{By})_z = (\tau_{By})_y + \frac{T_y C}{J} = \frac{V_z(Q_0) \alpha}{I_t} + \frac{T_y C}{J} = \frac{200(0,083)}{0,049089} + \frac{600(0,5)}{0,098178}$$

$$= 3398 \text{ psi}$$

$$(\tau_{By})_x = \frac{V_z(Q_0) z}{I_t} = 0$$



$$F_s = \frac{\sigma}{\sigma_{perm}} \rightarrow \sigma_{perm} = \frac{\sigma}{F_s} = \frac{7,8 \text{ ksi}}{1,2}$$

$$\sigma_{perm} = 6,5 \text{ ksi}$$

$$\tau_{perm} = \frac{\tau}{F_s} = \frac{3398 \text{ psi}}{1,2} = 2,8316 \text{ ksi}$$

Valor que debe tener