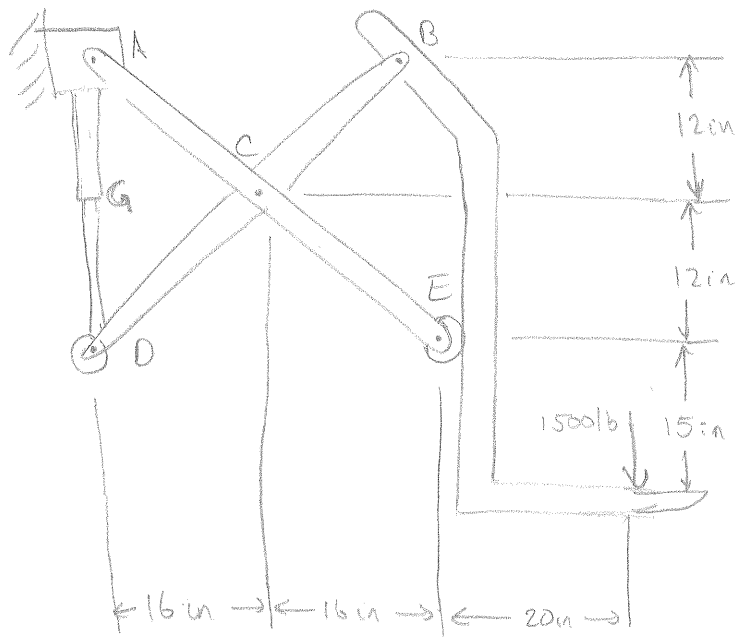
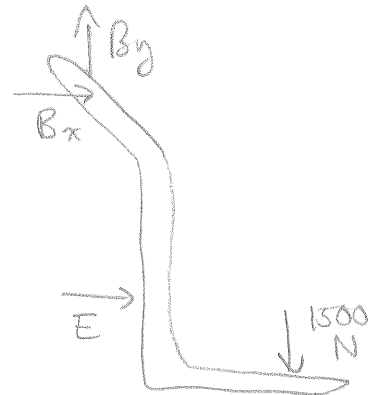


8.55a)



FBD



$$\uparrow \Sigma M_B = E(24 \text{ in}) - 1500 \text{ lb}(20 \text{ in}) = 0$$

$$E = 1500 \text{ lb} \left(\frac{20 \text{ in}}{24 \text{ in}} \right) = 1250 \text{ lb}$$

$$\Sigma F_x = B_x + E = 0 \Rightarrow B_x = -1250 \text{ lb}$$

$$\Sigma F_y = B_y - 1500 \text{ N} \Rightarrow B_y = 1500$$

$$\text{total force @ B} = \sqrt{B_x^2 + B_y^2} = \sqrt{(-1250 \text{ N})^2 + (1500 \text{ N})^2} = 1953 \text{ lb}$$

$$\tau_B = \frac{B}{A} = \frac{1953 \text{ lb}}{\pi (0.25 \text{ in})^2} = 9.95 \cdot 10^3 \text{ psi}$$

$\tau_B = 9.95 \text{ ksi}$