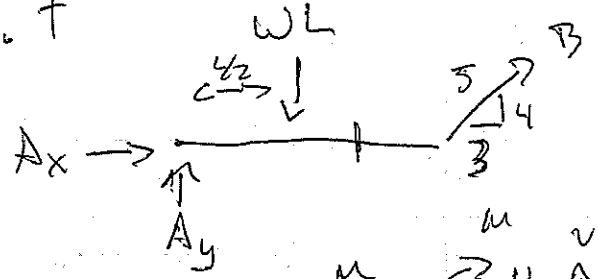
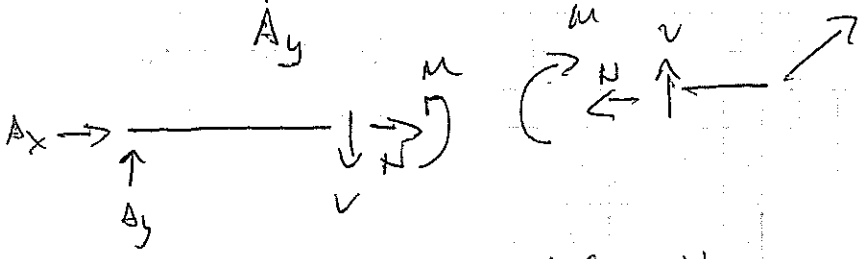
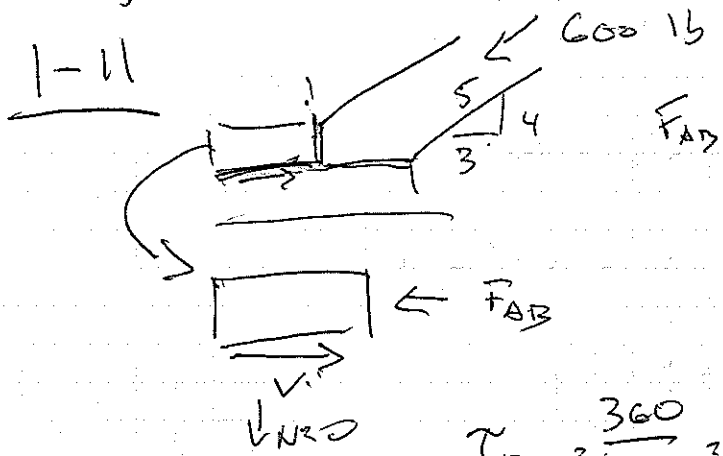
1.7

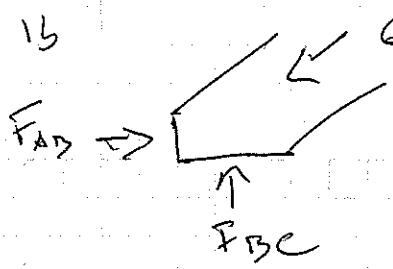


$\Sigma M_A = 0$



1-11





$F_{AB} = 360$

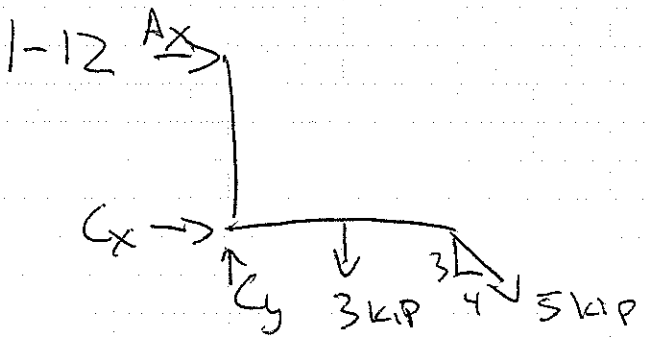
$F_{BC} = 480$

$\sigma_{AB} = 360/1.5\text{in}^2 = 240$ psi

$\sigma_{BC} = 480/3\text{in}^2 = 160$ psi

$\tau_{DB} = \frac{360}{4.5\text{in}^2} = 80$ psi

1-12



$\Sigma M_C = 0$

$-8A_x - 3(3) - \frac{3}{5}5 = 0$

$A_x = \frac{9+15}{-8} = -3$ kip

$C = \sqrt{C_x^2 + C_y^2} = 6.083$ kip

$\Sigma F_x = 0$

$C_x + A_x + \frac{4}{5}(5) = 0$

$C_x = -1$ kip

$1.5 = \frac{12 \text{ ksi}}{\tau_{allow}}$

$\tau_{allow} = 8$ ksi

$\Sigma F_y = C_y - 3 \not{+} -3 = 0$

$C_y = 6$ kip

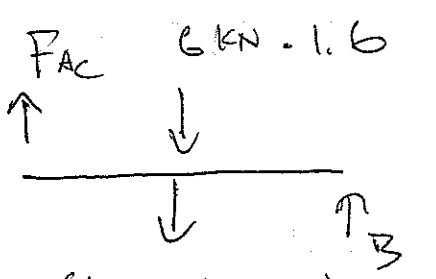
$\tau_A = 8 = \frac{3}{\pi(d/2)^2}$

$C \Rightarrow d = 0.696"$

$(d/2)^2 = 3/8\pi$

$d = 0.691"$

1-15



$\Sigma M_B = 0$

$9.6 \$ + 4.709 - 2 F_{AC} = 0$

$F_{AC} = 7.154$ kN

R

$\phi P \geq R$

$0.9 (345 \text{ MPa}) A \geq 7.154 \text{ kN}$

$A = 23.04 \text{ mm}^2 = \pi \left(\frac{d}{2}\right)^2$

$d \geq 5.42 \text{ mm}$