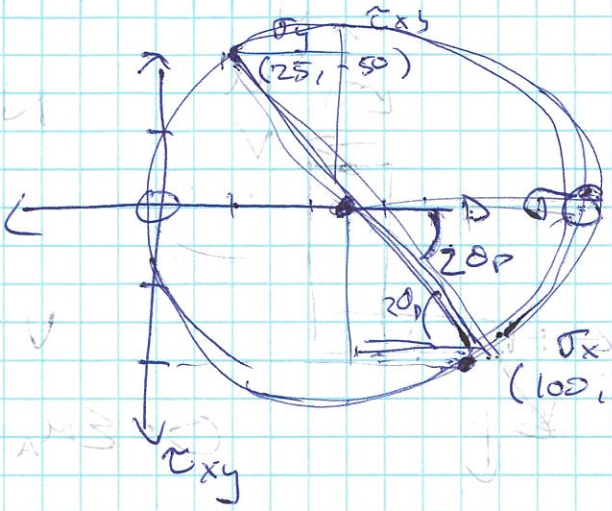
MOHR'S CIRCLE



$\sigma_x = 100$

$\sigma_y = 25$

$\tau_{xy} = 50.$

$\sigma_1 \approx 130$

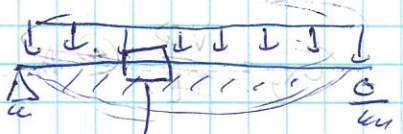
$\sigma_2 \approx 0$

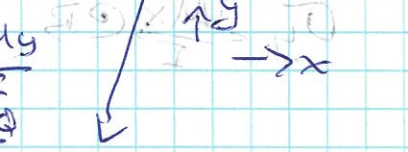
$\tau_{MAX} \approx 65$

$$\tan(2\theta_p) = \frac{\tau_{xy}}{\left(\sigma_x - \frac{\sigma_x + \sigma_y}{2}\right)}$$

COMBINED LOADING

- AXIAL LOAD $\Rightarrow \sigma = N/A$
- TORSIONAL LOAD $\Rightarrow \tau = \frac{Tr}{J}$
- BENDING $\Rightarrow \sigma = \frac{My}{I}$
- TRANSVERSE SHEAR $\Rightarrow \tau = \frac{VQ}{It}$

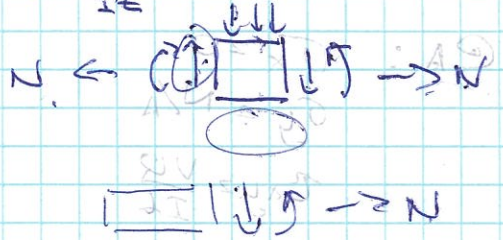


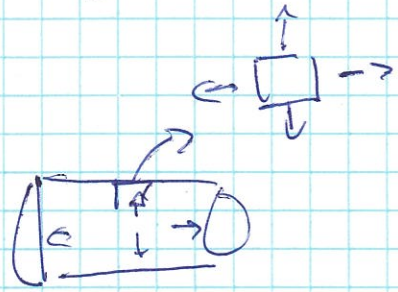


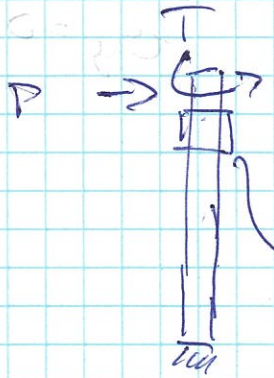
$\sigma_x = \sigma_A + \sigma_B$

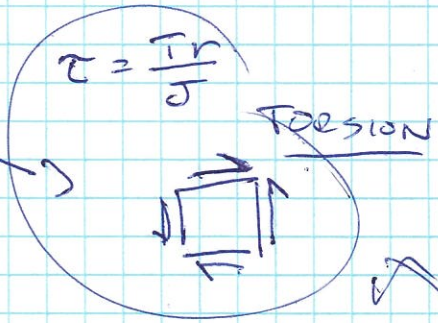
$\sigma_y = \sigma_A + \sigma_B$

τ_{xy}.





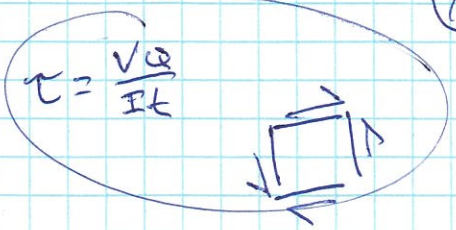




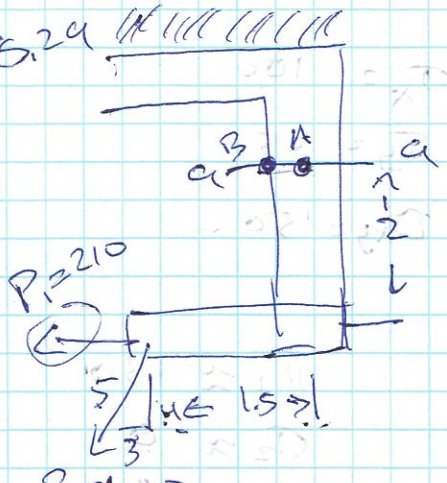
BENDING

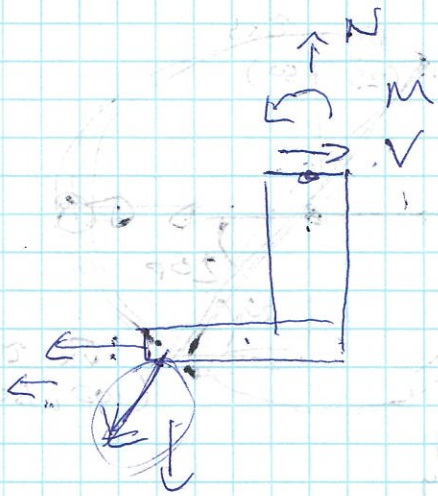
$\sigma = \frac{My}{I}$

TRANSVERSE SHEAR



Ex. 24





$N = \frac{4}{5}(600)$

$= 480$ lb

$V = 570$ lb

$0 = \Sigma M_A = -210(2) - \frac{3}{5}(600)(2) + \frac{4}{5}(600)(1.5) + M$

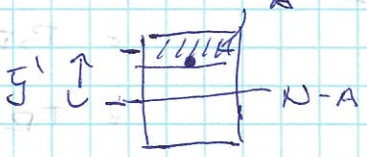
$M = 732$ in-lb

$\sigma_y = N/A$ @ A & B

$\tau_{xy} = \frac{VQ}{It}$ @ A @ B = 0

$\sigma_y = \frac{Mx}{I}$ @ B @ A = 0

$Q = \bar{y}' \bar{A}'$



@ A: $\sigma_x = 0$

$\sigma_y = N/A$

$\tau_{xy} = \frac{VQ}{It}$

@ B $\sigma_x = 0$

$\sigma_y = N/A + \frac{Mx}{I}$

$\tau_{xy} = 0$