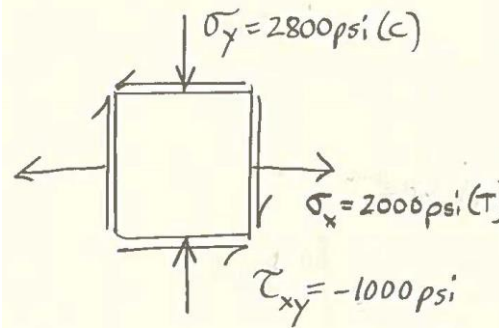


Worksheet Solution:

For the stress block shown:

Find:

- The principal stresses
- The maximum in-plane shear stress



$$\sigma_1, \sigma_2 = \frac{\sigma_x + \sigma_y}{2} \pm \sqrt{\left(\frac{\sigma_x - \sigma_y}{2}\right)^2 + \tau_{xy}^2}$$

$$\sigma_1, \sigma_2 = \frac{2000 - 2800}{2} \pm \sqrt{\left[\frac{2000 - (-2800)}{2}\right]^2 + (-1000)^2}$$

$$\sigma_1, \sigma_2 = -400 \pm 2600$$

$$\sigma_1 = 2200 \text{ psi (T)}$$

ANS

$$\sigma_2 = 3000 \text{ psi (C)}$$

ANS

$$\tau_{MAX} = \left(\frac{\sigma_1 - \sigma_2}{2}\right) = \left(\frac{2200 - (-3000)}{2}\right) = 2600 \text{ psi}$$

ANS