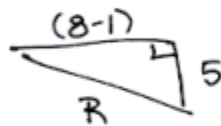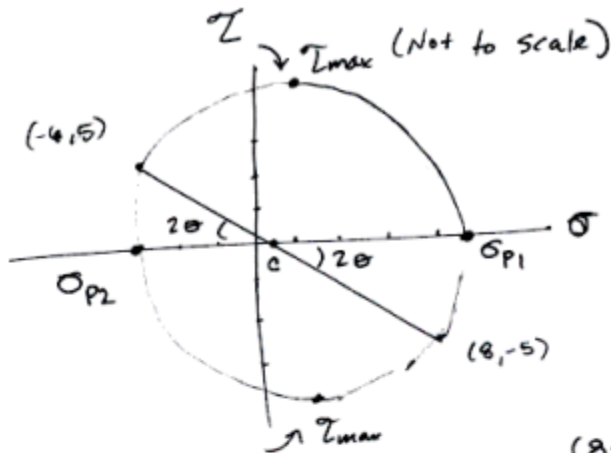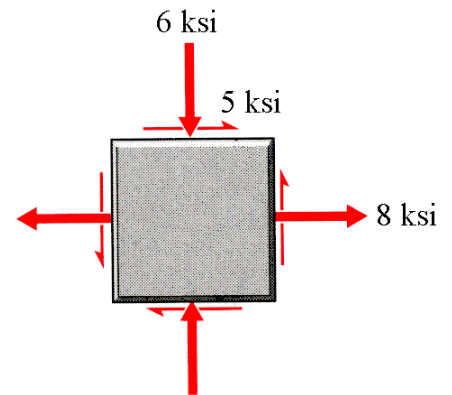<u>Use Mohr's circle</u> to determine the principal stresses and the maximum in-plane shearing stress and show these stresses on a properly labeled and oriented sketch (i.e., a single wedge element or two square elements).

Show steps clearly.

$$C = \frac{8 + (-6)}{2} = \frac{2}{2} = 1$$

$$R = \sqrt{(8-1)^2 + 5^2} = 8.6$$

$$\tan 2\theta = \left(\frac{5}{8-1}\right) \quad \theta_p = 17.77°$$

$$\sigma_{P_1} = C + R = 1 + 8.6 = 9.6 \text{ ksi } (T)$$

$$\sigma_{P_2} = C - R = 1 - 8.6 = -7.6 \text{ ksi}$$

$$= 7.6 \text{ ksi } (C)$$

$$\tau_{max} = R = 8.6 \text{ ksi}$$

$$\sigma_{avg} = C = 1 \text{ ksi } (T)$$

$$\theta_S = 45° - 17.77° = 27.23°$$