

Problem 6.7

(b) $\sigma_x = 12$ kpsi, $\tau_{xy} = -8$ kpsi

$$\sigma_A, \sigma_B = \frac{12}{2} \pm \sqrt{\left(\frac{12}{2}\right)^2 + (-8)^2} = 16, -4 \text{ kpsi}$$

MNS: Eq. (6-30a) $n = \frac{30}{16} = 1.88$ Ans.

BCM: Eq. (6-31b) $\frac{1}{n} = \frac{16}{30} - \frac{(-4)}{100} \Rightarrow n = 1.74$ Ans.

M1M: Eq. (6-32a) $n = \frac{30}{16} = 1.88$ Ans.

M2M: Eq. (6-33a) $n = \frac{30}{16} = 1.88$ Ans.

(c) $\sigma_x = -6$ kpsi, $\sigma_y = -10$ kpsi, $\tau_{xy} = -5$ kpsi

$$\sigma_A, \sigma_B = \frac{-6 - 10}{2} \pm \sqrt{\left(\frac{-6 + 10}{2}\right)^2 + (-5)^2} = -2.61, -13.39 \text{ kpsi}$$

MNS: Eq. (6-30b) $n = -\frac{100}{-13.39} = 7.47$ Ans.

BCM: Eq. (6-31c) $n = -\frac{100}{-13.39} = 7.47$ Ans.

M1M: Eq. (6-32c) $n = -\frac{100}{-13.39} = 7.47$ Ans.

M2M: Eq. (6-33c) $n = -\frac{100}{-13.39} = 7.47$ Ans.