9.3

$\sigma_x = -20$ $\tau_{xy} = 60$

$\sigma_y = 90$

$$2\theta_p = \tan^{-1}\left(\frac{2\tau_{xy}}{\sigma_x - \sigma_y}\right) = -23.7°$$

$$\sigma_{1,2} = \frac{\sigma_x + \sigma_y}{2} \pm \sqrt{\left(\frac{\sigma_x - \sigma_y}{2}\right)^2 + \tau_{xy}^2}$$

$\sigma_1 = 116$ $\sigma_2 = -46$ ksi

9.9

$\sigma_x = -8$ ksi $\tau_{xy} = -6$ ksi

$\sigma_y = 12$ ksi $\sigma_{AVG} = 2$ ksi