Prob. 10.9

Draw the Mohr's circles and determine the magnitudes of the principal stresses for the following stress states. Denote the principal stress state on a suitably rotated stress square.

(a) $\sigma_x = 30 \text{ MPa}, \sigma_y = -10 \text{ MPa}, \tau_{xy} = 25 \text{ MPa}.$

(b) $\sigma_x = -30 \text{ MPa}, \sigma_y = -90 \text{ MPa}, \tau_{xy} = -40 \text{ MPa}.$

(c) $\sigma_x = -10 \text{ MPa}, \sigma_y = 20 \text{ MPa}, \tau_{xy} = -15 \text{ MPa}.$
\[ \sigma_{p2} = -16 \]

[Diagram showing points labeled x(-10,15) and y(20,-15) with \( \sigma_{p1} = 26 \).]