

Prob. 2.3.2

Determine the principal stresses for the following states of stress (all in MPa):

$$(a) \quad [\sigma] = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 75 & 30 \\ 0 & 30 & -45 \end{bmatrix}$$

$$(e) \quad [\sigma] = \begin{bmatrix} 0 & 20 & 0 \\ 20 & 0 & 10 \\ 0 & 10 & 0 \end{bmatrix}$$

$$(b) \quad [\sigma] = \begin{bmatrix} -80 & -40 & 80 \\ -40 & 40 & 120 \\ 80 & 120 & -40 \end{bmatrix}$$

$$(f) \quad [\sigma] = \begin{bmatrix} 0 & 40 & 50 \\ 40 & 0 & 20 \\ 50 & 20 & 0 \end{bmatrix}$$

$$(c) \quad [\sigma] = \begin{bmatrix} 55 & -33 & 55 \\ -33 & 85 & 75 \\ 55 & 75 & -120 \end{bmatrix}$$

$$(g) \quad [\sigma] = \begin{bmatrix} 0 & 100 & 100 \\ 100 & 0 & 100 \\ 100 & 100 & 0 \end{bmatrix}$$

$$(d) \quad [\sigma] = \begin{bmatrix} 180 & -140 & 110 \\ -140 & 120 & 80 \\ 110 & 80 & -80 \end{bmatrix}$$

Prob. 2.3.4 Determine the corresponding principal directions for the states of stress in Prob. 2.3.2