By repeating the same process for $\lambda = 1$, the eigenvector is

$$\mathbf{x}_2 = \begin{bmatrix} -1 \\ 2 \end{bmatrix}$$

(b) The characteristics equation is

$$(2-\lambda)(\lambda-4)(\lambda-1) = 0.$$

The eigenvalues are $1, 2, 4$. The eigenvector corresponding to $\lambda = 1$ is $\mathbf{x}_1 = \begin{bmatrix} -1 \\ 1 \\ 1 \end{bmatrix}$.

The eigenvector corresponding to $\lambda = 2$ is $\mathbf{x}_2 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$.

The eigenvector corresponding to $\lambda = 4$ is $\mathbf{x}_3 = \begin{bmatrix} 7 \\ -4 \\ 2 \end{bmatrix}$.

(c) The characteristics equation is

$$\lambda^3 - 5\lambda^2 + 2\lambda + 8 = 0.$$

The eigenvalues are $-1, 2, 4$.

The eigenvector corresponding to $\lambda = -1$ is $\mathbf{x}_1 = \begin{bmatrix} -8 \\ 10 \\ 7 \end{bmatrix}$.

The eigenvector corresponding to $\lambda = 2$ is $\mathbf{x}_2 = \begin{bmatrix} 1 \\ -2 \\ 1 \end{bmatrix}$.

The eigenvector corresponding to $\lambda = 4$ is $\mathbf{x}_3 = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$.

(d) The characteristics equation is

$$(\lambda-3)(\lambda-1)(\lambda-4) = 0.$$

The eigenvalues are $1, 3, 4$.

The eigenvector corresponding to $\lambda = 1$ is $\mathbf{x}_1 = \begin{bmatrix} -1 \\ 2 \\ 2 \end{bmatrix}$.

The eigenvector corresponding to $\lambda = 3$ is $\mathbf{x}_2 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$.

The eigenvector corresponding to $\lambda = 4$ is $\mathbf{x}_3 = \begin{bmatrix} 7 \\ -2 \\ 1 \end{bmatrix}$.

Preview from Notesale.co.uk
Page 2 of 3