

**Var. 1 (1)**

1. Is the column  $(1, 2, 2)^T$  an eigenvector of  $\begin{pmatrix} -5 & -3 & 6 \\ -6 & -2 & 6 \\ -6 & -3 & 7 \end{pmatrix}$ ? If yes, find the corresponding eigenvalue.
2. Check that  $\lambda = -1$  is an eigenvalue of  $\begin{pmatrix} 5 & 0 & -6 \\ -8 & -1 & 8 \\ -4 & -4 & -1 \end{pmatrix}$  and find the corresponding eigenvectors.
3. Find eigenvalues and eigenvectors of  $\begin{pmatrix} -4 & -1 \\ 6 & 1 \end{pmatrix}$ .

**Var. 2 (1)**

1. Is the column  $(0, 1, 2)^T$  an eigenvector of  $\begin{pmatrix} -6 & -2 & 1 \\ 8 & 4 & -4 \\ 10 & 10 & -9 \end{pmatrix}$ ? If yes, find the corresponding eigenvalue.
2. Check that  $\lambda = -2$  is an eigenvalue of  $\begin{pmatrix} -3 & -6 & 6 \\ -3 & 0 & -2 \\ -3 & -3 & 1 \end{pmatrix}$  and find the corresponding eigenvectors.
3. Find eigenvalues and eigenvectors of  $\begin{pmatrix} -9 & 8 \\ -6 & 5 \end{pmatrix}$ .

**Var. 3 (1)**

1. Is the column  $(1, -1, 0)^T$  an eigenvector of  $\begin{pmatrix} -5 & -2 & 2 \\ -2 & -5 & 2 \\ -6 & -6 & 3 \end{pmatrix}$ ? If yes, find the corresponding eigenvalue.
2. Check that  $\lambda = -1$  is an eigenvalue of  $\begin{pmatrix} -1 & -5 & 5 \\ -5 & -1 & 5 \\ -5 & -5 & 9 \end{pmatrix}$  and find the corresponding eigenvectors.
3. Find eigenvalues and eigenvectors of  $\begin{pmatrix} 1 & 3 \\ -4 & 8 \end{pmatrix}$ .

**Var. 4 (1)**

1. Is the column  $(1, 0, 1)^T$  an eigenvector of  $\begin{pmatrix} -3 & 2 & 2 \\ 7 & -3 & -7 \\ -7 & 2 & 6 \end{pmatrix}$ ? If yes, find the corresponding eigenvalue.
2. Check that  $\lambda = -5$  is an eigenvalue of  $\begin{pmatrix} -3 & -2 & 0 \\ 1 & -4 & 1 \\ -2 & 2 & -5 \end{pmatrix}$  and find the corresponding eigenvectors.
3. Find eigenvalues and eigenvectors of  $\begin{pmatrix} 2 & 6 \\ -1 & 7 \end{pmatrix}$ .