
Show all work. 5 points each.

1. Find an eigenvector for the eigenvalue $\lambda = 1$ and the matrix $\begin{bmatrix} 5 & 0 \\ 2 & 1 \end{bmatrix}$.

2. Find the characteristic polynomial and the eigenvalues for $\begin{bmatrix} 2 & 1 \\ -1 & 4 \end{bmatrix}$.