

Q1) The matrix $A = \begin{pmatrix} 4 & 1 & 0 \\ 0 & 4 & 1 \\ 0 & 0 & 4 \end{pmatrix}$ has only one eigen value $\lambda = 4$. Find the general solution of the system $X'(t) = AX(t)$.

Q2) The matrix $A = \begin{pmatrix} 1 & 2 \\ -2 & 1 \end{pmatrix}$ has complex eigenvalues $1 + 2i, 1 - 2i$. Find the general solution of the system $X'(t) = AX(t)$.

Q3) Find the eigenvalues of the matrix $A = \begin{pmatrix} 3 & 2 & 4 \\ 2 & 0 & 2 \\ 4 & 2 & 3 \end{pmatrix}$