

Show all your work. No credits for answers without work.

Consider the matrix $A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

- (a) Find the characteristic polynomial of A .
- (b) Find the eigenvalues and the corresponding eigenvectors of A .
- (c) Is the matrix A diagonalizable??? Why.
- (d) If A is diagonalizable, find a nonsingular matrix P and a diagonal matrix D such that $A = PDP^{-1}$.
- (e) Find the determinant of A .
- (f) Use Cayley-Hamilton Theorem to find A^3 without multiplying A with itself.