

Problem 1: Let

$$A = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$$

a) Find A 's characteristic polynomial, real eigenvalues, and bases for their associated eigenspaces.

b) What is the row-reduced echelon form of A ? For $\text{rref}(A)$, find the characteristic polynomial, real eigenvalues, and bases for their associated eigenspaces?

Problem 2: Define:

- a) Inner Product
- b) Orthonormal
- c) Eigenvalue
- d) Eigenvector

Problem 3: Must a matrix with real entries have any real eigenvalues?