

Eigenvalues and EigenvectorsProblem Sheet, Friday 18.08.2023 (Room U119)

Question 1: Find the eigenvalues of a 2×2 matrix with trace 0 and determinant 1, using the facts that the trace of a matrix is equal to the sum of its eigenvalues, and the determinant is the product of its eigenvalues.

Question 2: If λ is an eigenvalue of the matrix A , prove that λ^n is an eigenvalue of A^n for $n \geq 2$.

Question 3: Find the eigenvalues and eigenvectors of the matrix $A = \begin{bmatrix} 1 & 0 & 3 \\ 0 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$.