Tutorial 9

Problem 1 Let $A = \begin{bmatrix} 5 & 3 \\ 3 & 5 \end{bmatrix}$.

(a) Show that A is symmetric.

(b) Find a orthonormal basis of $\mathbf{R}^2$ consisting of eigenvectors.

(c) Find a diagonal matrix that is orthogonally similar to the matrix A.

(d) Compute the determinant of A^5.

(e) Sketch the conic section $5x_1^2 + 6x_1x_2 + 5x_2^2 = 32$ in the x_1x_2 plane.