Section 3.11. Do the assigned problems in the order indicated. Proceed as follows:

a. Verify that the given matrix $A$ is symmetric (Hermitian in #43).
b. Calculate the eigenvalues and eigenvectors of the given matrix $A$.
c. Find an orthogonal matrix (unitary matrix in #43) $S$ that diagonalizes the given matrix $A$. Show that $S^{-1}AS$ is the diagonal matrix of eigenvalues.