6.1 Exercises

Problem 1 Find the (real) eigenvalues, the associated eigenvectors, and a basis for each eigenspace for the matrix: $\mathbf{A} = \begin{bmatrix} 4 & -3 & 1 \\ 2 & -1 & 1 \\ 0 & 0 & 2 \end{bmatrix}$.

Problem 2 Find the complex-conjugate eigenvalues and corresponding eigenvectors of the matrix:

$$\mathbf{A} = \begin{bmatrix} 0 & -12 \\ 12 & 0 \end{bmatrix}.$$

Problem 3 **a) Suppose that A is a square matrix**.

Use the characteristic equation to show that A and $\mathbf{A}^T$ have the same eigenvalues.