ENG EC/ME/SE 501:

Exercises (Set 2) \hspace{1cm} (Due 10/1/19)

1. For the following two matrices:

\[ A = \begin{pmatrix} -2 & 0 & -1 \\ 4 & 2 & 4 \\ 0 & 0 & -1 \end{pmatrix} \quad B = \frac{1}{8} \begin{pmatrix} 9 & 0 & -3 \\ 10 & -8 & 2 \\ 3 & 0 & -1 \end{pmatrix} \]

find (a) the characteristic polynomial; (b) the determinant and trace; (c) the eigenvectors.

2. Find the Jordan Normal Form \( J_A \) of

\[ A = \begin{pmatrix} 5 & -7 & 4 \\ 8 & -7 & 4 \\ 12 & -12 & 7 \end{pmatrix}. \]

3. For the matrix in Problem 2, find a nonsingular matrix (change of basis) \( U \) such that

\[ U^{-1} \cdot A \cdot U = J_A. \]