ENG EC/ME/SE 501:

Exercises (Set 2)  (Due 10/1/20)

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

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