HOMEWORK 10

• Section 9.5 in the book: Exercises 8, 10, 14, 16, 22, 26, 28, 32.

Problem 1. For each of the following matrices, perform the following tasks:

a) classify the equilibrium point of the system $x' = Ax$ based on the position of (T, D) in the trace determinant plane;

b) compute the eigenvalues and eigenvectors and write down the general solution;

c) sketch the phase plane portrait.

1. $A = \begin{pmatrix} -16 & 9 \\ -18 & 11 \end{pmatrix}$

   2. $A = \begin{pmatrix} 8 & 3 \\ -6 & -1 \end{pmatrix}$

   3. $A = \begin{pmatrix} 6 & -5 \\ 10 & -4 \end{pmatrix}$

4. $A = \begin{pmatrix} 4 & 3 \\ -15 & -8 \end{pmatrix}$

   5. $A = \begin{pmatrix} -5 & 2 \\ -6 & 2 \end{pmatrix}$