

MATH 246 Homework 3.6
Justin Wyss-Gallifent

Directions:

- Work should be done neatly and on separate paper.
 - Enough work must be shown so that the steps you are taking is clear.
-

For each of the following systems first find the eigenvalues and eigenvectors, then sketch a reasonable family of solutions and finally trace and label the specific solutions with initial values $\bar{x}(0) = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$

and $\bar{x}(0) = \begin{bmatrix} -2 \\ 0 \end{bmatrix}$.

1. $\bar{x}' = \begin{bmatrix} -7 & 1.5 \\ 2 & -5 \end{bmatrix} \bar{x}$

2. $\bar{x}' = \begin{bmatrix} -4 & 2 \\ 8 & -4 \end{bmatrix} \bar{x}$

3. $\bar{x}' = \begin{bmatrix} -16 & -21 \\ 14 & 19 \end{bmatrix} \bar{x}$

4. $\bar{x}' = \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix} \bar{x}$

5. $\bar{x}' = \begin{bmatrix} 1 & -4 \\ 2 & -3 \end{bmatrix} \bar{x}$

6. $\bar{x}' = \begin{bmatrix} 1.5 & 7.5 \\ -1.5 & -1.5 \end{bmatrix} \bar{x}$

7. $\bar{x}' = \begin{bmatrix} 0 & 2 \\ 0 & 0 \end{bmatrix} \bar{x}$