Assignment 4

Solve Q 2,4,5 and 7

1. Find the eigenvalue and eigen vector of the given matrix

$$\begin{bmatrix} 5 & -1 & 0 \\ 0 & -5 & 9 \\ 5 & -1 & 0 \end{bmatrix}$$

2. Find the general solution of the given system

$$X' = \begin{bmatrix} -6 & 2 \\ -3 & 1 \end{bmatrix} X$$

3. Solve the given initial-value problem.

$$X' = \begin{bmatrix} 2 & 4 \\ -1 & 6 \end{bmatrix} X, \qquad X(0) = \begin{bmatrix} -1 \\ 6 \end{bmatrix}$$

4. Find the general solution of the given system

$$x' = 2x + y + 2z$$
$$y' = 3x + 6z$$
$$z' = -4x - 3z$$

5. Find the eigenvalues and eigenvectors of the given nonsingular matrix **A**

$$\mathbf{A} = \begin{bmatrix} 1 & 2 & -1 \\ 1 & 0 & 1 \\ 4 & -4 & 5 \end{bmatrix}$$

6. Find the general solution of the given system

$$X' = \begin{bmatrix} -1 & 1 & 0 \\ 1 & 2 & 1 \\ 0 & 3 & -1 \end{bmatrix} X$$

7. Find the general solution of the given system

$$X' = \begin{bmatrix} -1 & 3 \\ -3 & 5 \end{bmatrix} X$$

8. Find the general solution of the given system

$$\frac{dx}{dt} = 6x - y$$

$$\frac{dy}{dt} = 5x + 2y$$