

Assignment 5

1. Solve the given system of equations

$$x' = 3x + 2y + 1$$

$$y' = -2x - y + 1$$

2. Solve the given initial value problem

$$X' = \begin{pmatrix} 3 & -1 \\ -1 & 3 \end{pmatrix} X + \begin{pmatrix} 4e^{2t} \\ 4e^{4t} \end{pmatrix}, \quad X(0) = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

3. Solve the given system of equation

$$x' = x - y + 3e^t$$

$$y' = x + y + 3e^t$$

4) Solve the given system

$$X' = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 3 \\ 0 & 0 & 5 \end{bmatrix} X + \begin{bmatrix} 1 \\ -1 \\ 2 \end{bmatrix} e^{4t}$$

5) Solve the given system

$$\frac{dx}{dt} = 5x + 9y + 2; \quad \frac{dy}{dt} = -x + 11y + 6$$

6) Solve the given system

$$X' = \begin{bmatrix} 1 & -4 \\ 4 & 1 \end{bmatrix} X + \begin{bmatrix} 4t + 9e^{6t} \\ -t + e^{6t} \end{bmatrix}$$