

Math 285
Fall 2009

Name _____

Homework #6
Due Monday, November 23
No late papers accepted! No excuses!

1. Solve the given non-homogeneous system.

$$x_1' = -2x_1 + x_2 + t$$

$$x_2' = -2x_1 + x_2 + 1$$

2. Determine the general solution to the system $\vec{x}' = A\vec{x}$ for the given matrix A.

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

3. Use the variation of parameters technique to find a particular solution \vec{x}_p to $\vec{x}' = A\vec{x} + \vec{b}$ for the given A and \mathbf{b} . Also obtain the general solution to the system of differential equations.

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & -3 & 2 \\ 1 & -2 & 2 \end{bmatrix} \quad \vec{b} = \begin{bmatrix} -e^t \\ 6e^{-t} \\ e^t \end{bmatrix}$$

4. Use the variation-of-parameters method to find the general solution to the given differential equation.

$$y'' + 9y = \frac{36}{4 - \cos^2(3x)}$$