KF

Math 202 (143)
Quiz 4 (8.1-8.3)

Name: ID #: Section #:

1. Given $X_c = c_1 \begin{pmatrix} 1 \\ 1 \end{pmatrix} e^t + c_2 \begin{pmatrix} 0 \\ 1 \end{pmatrix} e^{-t}$ is the complementary solution of $\mathrm{X}' = \mathrm{AX} + \begin{pmatrix} 1+t \\ t \end{pmatrix}$. Find a fundamental matrix for the system $\mathrm{X}' = \mathrm{AX}$.

2. Let $\begin{pmatrix} e^t & e^{-t} \\ e^t & 0 \end{pmatrix}$ be a fundamental matrix for the system $\mathrm{X}' = \mathrm{AX} + \begin{pmatrix} 0 \\ t \end{pmatrix}$. Find a particular solution for this system.

3. If $X_1 = \begin{pmatrix} 1 \\ 1 \end{pmatrix} e^{2t}$ is a solution of the system $\mathrm{X}' = \begin{pmatrix} -1 & 3 \\ -3 & 5 \end{pmatrix} \mathrm{X}$ which corresponds to the eigenvalue $\lambda = 2$ of multiplicity 2. Find a second linearly independent solution.