

Name: _____ ID #: _____ Serial #: _____

1. [10pts] Let $A = \begin{pmatrix} 1 & -4 \\ 4 & 9 \end{pmatrix}$. Verify that $X_1 = \begin{pmatrix} -4 \\ 4 \end{pmatrix} e^{5t}$ and $X_2 = \begin{pmatrix} 1 - 4t \\ 4t \end{pmatrix} e^{5t}$ form a fundamental set of solutions for the system $X' = AX$.

2. [10pts] Solve the system $X' = \begin{pmatrix} 1 & 2 \\ -2 & 1 \end{pmatrix} X$