Name:_____   Date: _____

Please show your work.

1. (5 pts)   Suppose that the 2x2 matrix A has $\lambda = 2 + 3i$ as an eigenvalue with eigenvector $\vec{V} = \begin{pmatrix} 3+i \\ 2 \end{pmatrix}$

Write the general solution of $\dfrac{d\vec{Y}}{dt} = A\vec{Y}$.

2. (5 pts) Given the linear system: $\dfrac{d\vec{Y}}{dt} = A\vec{Y}$ where matrix A has eigenvalues $\lambda_1 = 0$

and $\lambda_2 = 1$ with corresponding eignevectors $\vec{V_1} = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$ and $\vec{V_2} = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$.

Make a sketch of the phase portrait for this system.