

Name: _____

Date: _____

MA 226 Quiz 8 – B

Please show your work.

1. (5 pts) Solve the initial value problem $\frac{d\vec{Y}}{dt} = \begin{pmatrix} -2 & -2 \\ -2 & 1 \end{pmatrix} \vec{Y}$ with $\vec{Y}(0) = \begin{pmatrix} 1 \\ 13 \end{pmatrix}$

- a.) Find the eigenvalues
- b.) Find the corresponding eigenvectors
- c.) Find the solution of the initial value problem.

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2. (5 pts) The linear system: $\frac{d\vec{Y}}{dt} = A\vec{Y}$ where matrix has a general solution given by $\vec{Y}(t) = k_1 e^t \begin{pmatrix} 1 \\ 1 \end{pmatrix} + k_2 e^{-4t} \begin{pmatrix} -1 \\ 2 \end{pmatrix}$. Make a sketch of the phase portrait for this system.

