Name:_____ Date: _____

MA 226 Quiz 9 – B

Please show your work.

1. (5 pts) Given the linear system $\frac{d\vec{Y}}{dt} = A\vec{Y}$ where $A = \begin{pmatrix} -3 & -5 \\ 3 & 1 \end{pmatrix}$

a. Find the eigenvalues for the matrix A

b. Find one eigenvector

c. Classify the equilibrium point (0,0) as a sink, source, saddle, spiral sink, center, or spiral source.

d. If there is a spiral sink , spiral source or center what is the direction of rotation ?

Name:_____ Date: _____

2. (5 pts) Given the linear system: $\frac{d\vec{Y}}{dt} = A\vec{Y}$ where matrix A has eigenvalues $\lambda_1 = 0$ and $\lambda_2 = -2$ with corresponding eignevectors $\vec{V_1} = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$ and $\vec{V_2} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$.

Make a sketch of the phase portrait for this system.