

Name: _____

Date: _____

MA 226 Quiz 10 – A

Please show your work.

1. (5 pts) Find the solution of the given initial value problem:

$$\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 5y = 0 \quad \text{with} \quad y(0) = 11 \quad \text{and} \quad y'(0) = -7$$

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2. (5 pts) The one parameter family shown below yields a unique curve in the trace determinant plane.

a.) Sketch the corresponding curve in the trace-determinant plane.

b.) Make a list of the type of behaviors exhibited by the system as the parameter varies from +infinity to - infinity.

c.) Identify the values of the parameter that correspond to bifurcation values.

$$\frac{d\vec{Y}}{dt} = \begin{pmatrix} 0 & a \\ -2 & -3 \end{pmatrix} \vec{Y}$$