

Name: _____

Date: _____

MA 226 Quiz 2 – A

Please show your work.

1. (5 pts) Consider the differential equation $\frac{dy}{dt} = y^3 - 3y^2 - 4y$

a.) For what values of y is $y(t)$ in equilibrium?

b.) For what values of y is $y(t)$ increasing?

c.) For what values of y is $y(t)$ decreasing?

2. (5 pts) MacQuarie Island is a small island about half-way between Antarctica and New Zealand. Between 2000 and 2006, the population of rabbits on the island rose from 4,000 to 380,000. Model the growth in rabbit population $R(t)$ at time t using

an exponential growth model $\frac{dR}{dt} = kR$ where $t = 0$ corresponds to the year

2000. What is an appropriate value of the growth rate parameter k and what does the model predict the rabbit population will be in the year 2010?