

APMA 0360: HOMEWORK ASSIGNMENT #8
DUE DATE: 4PM, NOVEMBER 2ND, 2012

Name:

Grade:

Sections 9.4 & 9.5

For each of the differential equations given in problems 1,2,5 in Section 9.4, page 530-531 and in problems 1,3,4 in Section 9.5, page 540, answer the following questions:

- (a) Find all critical points;
- (b) Find the linearization (or linearized system) of the differential equation around each critical point.
- (c) Determine the type of stability or instability of each critical point (from linear to nonlinear system).
- (d) Sketch a possible phase portrait for the nonlinear system (at least near each critical point).
- (e) Determine the limiting behavior of the solution x,y as $t \rightarrow \infty$ and interpret the results in terms on the population of the two species.

Sections 9.4: Problem 8