HOMEWORK 9

DUE: MONDAY, JUNE 19

*Read the solved examples in chapters **9.4 : Competing Species** and **9.5 : Predator-Prey Equations** from the book.*

For each of the following systems find **all** the equilibria, classify them and sketch the phase portraits in the neighborhood of each.

1.

$$x' = (x - 1)(y - 3)$$

$$y' = y - x$$

2.

$$x' = (x - 3)(y - 1)$$

$$y' = y - x$$

3.

$$x' = x^2 - 4y^2$$

$$y' = (x - 2)(y - 4)$$

4.

$$x' = (x^2 - 1)(y^2 + 1)$$

$$y' = xy$$

5.

$$x' = (x^2 - 1)(y^2 + 1)$$

$$y' = -xy$$

6.

$$x' = (x - 2)(y - 3)$$

$$y' = (x + 2)(y - 2)$$