Homework Math 6390
Due March 9, 2000

Draw the phase planes (trajectories, nullclines, and critical points) and determine the stability of the critical points for the following systems. (Make sure to show that the system is almost linear near the critical points).

$$\frac{dx}{dt} = x - y + xy$$

$$\frac{dy}{dt} = 3x - 2y - xy$$

$$\frac{dx}{dt} = e^{-x+y} - \cos x$$

$$\frac{dy}{dt} = \sin(x - 3y)$$

$$\frac{dx}{dt} = 1 - xy$$

$$\frac{dy}{dt} = x - y^3$$

$$\frac{dx}{dt} = x - x^2 - xy$$

$$\frac{dy}{dt} = 3y - xy - 2y^2$$