Math 490N

- 1. Find the fixed points, investigate the stability of each, and sketch the phase portrait for each of the following equations:
 - (a) $x' = 4x^2 16$ (b) $x' = x - x^3$ (c) $x' = -x - x^3$ (d) $x' = x^2(4 - x^2)$ (e) $x' = 1 - 2\cos x$
- 2. Find the fixed points and investigate the stability of each for each of the following systems:

(a)
$$\begin{cases} x' = y \\ y' = 2x + y \end{cases}$$

(b)
$$\begin{cases} x' = -3y \\ y' = 2x + 5y \end{cases}$$

(c)
$$\begin{cases} x' = x + y \\ y' = -2x + 3y \end{cases}$$

(d)
$$\begin{cases} x' = x + x^{3} + y \\ y' = 2x + y \end{cases}$$

Biol 595N

Homework 1

Due Tuesday, 27 January

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(c)
$$x' = -x - x^3$$

(d) $x' = x^2(4 - x^2)$