EEL 3657

Homework # 2 - Due Th May 30

Covers Linearization and a question on transfer functions. Your notes and the textbook should be ample material to solve these problems. For Q3, you might need to consult your circuits course notes.

1. Find all the fixed points of

$$\dot{x} = -x + x^3$$

$$\dot{y} = -2y$$

and linearize the system about the fixed points. Find the eigenvalues of the linearization.

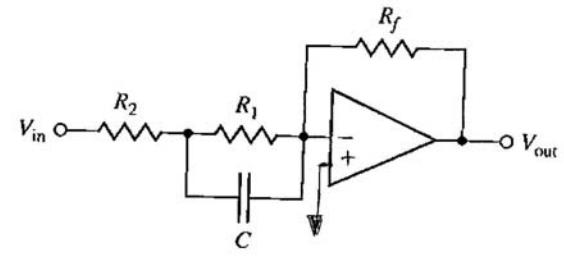
2. Consider

$$\dot{x} = -y + ax(x^2 + y^2)$$

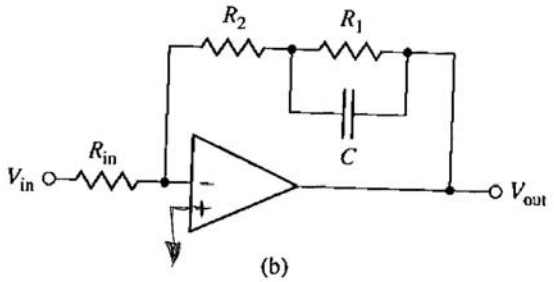
$$\dot{y} = x + ay(x^2 + y^2)$$

Linearize about (0,0).

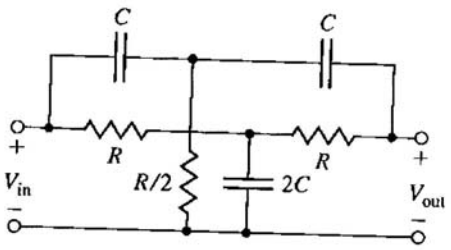
3. Write down the dynamic equations and find the transfer functions for the electric circuits shown below: (a) lead circuit, (b) lag circuit, (c) notch circuit.



(a)



(b)



(c)