Fill out information below and attach this cover sheet to the FRONT of your HW.
If you do not (or enter incorrect information) you WILL loose 10 points on the HW.

NAME:_____
SID #:_____
Circle One: EE42 / EE100
If EE100, Lab Day:_____,Time:_____

EE 100

Homework # 8

L. Chua Fall 2008

Issued : Oct. 16 Due : Oct. 24

1.(*a*) Show that the two-port in Fig. P4.2 realizes a CCCS. Assume the op amp is operating in the linear region.

(*b*) Find the dynamic range of v_2 and i_1 required for linear operation of the op amp.

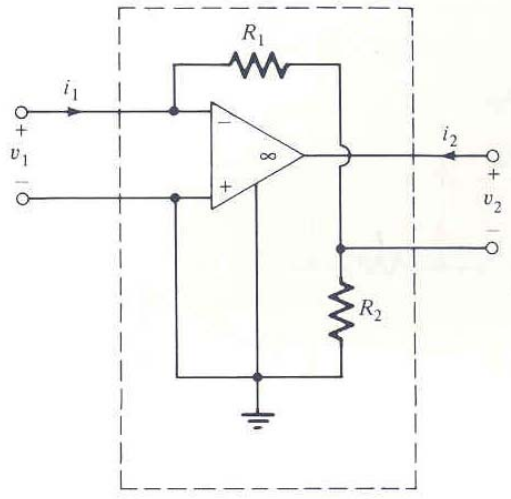

Figure P4.2

2. Consider the op-amp circuit shown below. Derive and draw the v_o vs. v transfer characteristic (TC) plot.

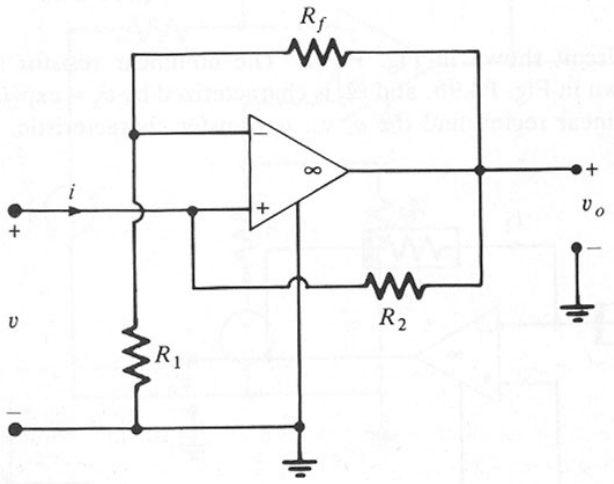

Figure P4.12

3. Draw the DP plot of the op amp circuit in problem 2 using the following circuit element values:

(a) $R_1 = 2.2\ K\Omega$, $R_2 = R_f = 220\ \Omega$, $E_{sat} = 8.3\ V$

(b) Repeat for the following circuit element values:

$R_1 = 3.3\ K\Omega$, $R_2 = R_f = 22\ K\Omega$, $E_{sat} = 8.3\ V$`

4. (a) Draw the op-amp CIRCUIT obtained by connecting the *driving points* of the two op amp circuits from problem 3(a) and 3(b) in parallel. Use the same element values as in problem 3.

Remark:

The resulting circuit (called the Chua diode in the literature) is the building block for Chua's circuit, which exhibits *chaos*.

(b) Now, draw the DP plot of the op amp circuit from (a).

Hint: Apply *graphical current addition* of 2 nonlinear resistors connected in parallel.