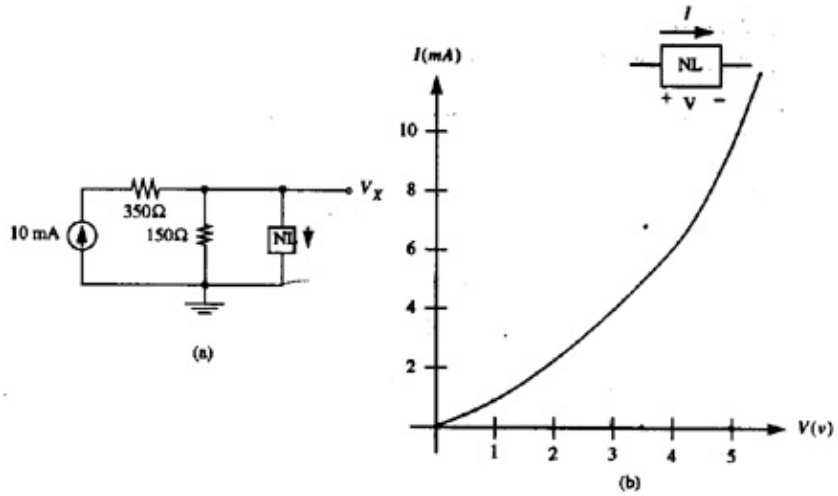
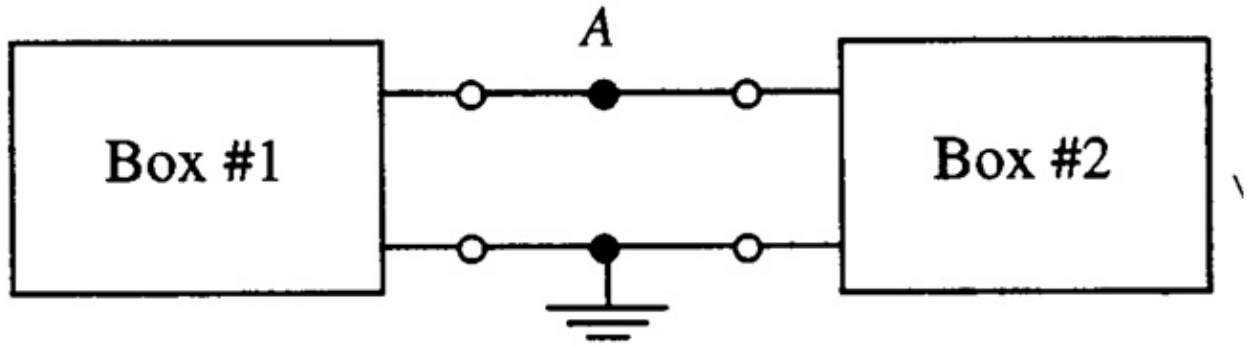
EE40 Spring 1998
Midterm #1
S. Schwarz, R. M. White

Problem #1



The nonlinear circuit element NL in Fig. (a) has the I-V characteristic shown in (b). (Sign conventions for V, I are as shown.) Find Vx with respect to ground.

Problem #2

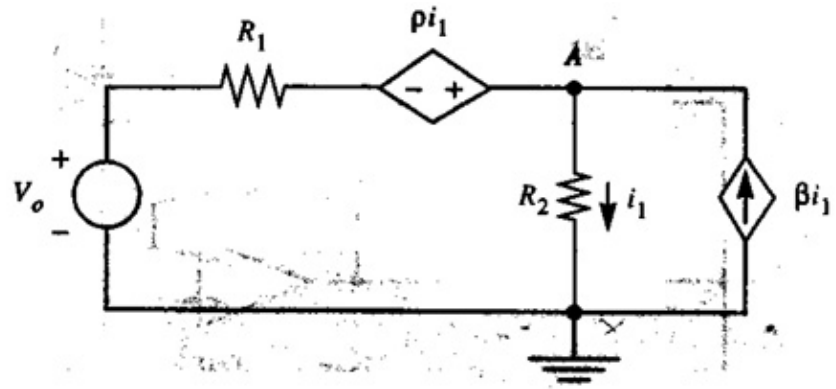


Box #1 is represented by a Thevenin equivalent with VT1 = 5V, RT1 = 3000 ohms. For Box #2, VT2 = -6V, RT2 = 2000 ohms. The two boxes are connected together as shown.

a) Find the voltage at node A with respect to ground.

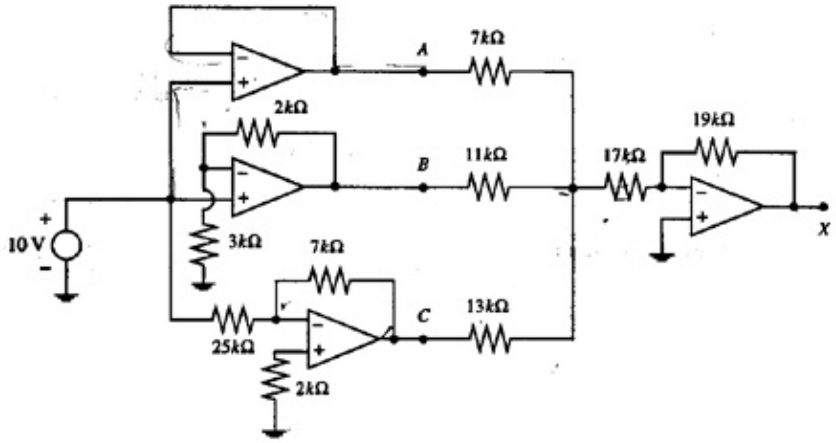
b) Find the power flow (in watts) between the boxes, in the direction from Box 1 into Box #2.

Problem #3



In the above circuit Vo = 10V, R1 = 1000 ohms, R2 = 2000 ohms, rho = 5000, beta = 0.7. Find the volatge at node A with respect to ground. (For ease of grading, please write equations using letter symbols, solve the equations, and then substitute numerical values as the final step.)

Problem #4



In the above circuit all the op-amps are "ideal".

a) Find Va (the voltage at node A with respect to ground):

b) Find Vb:

c) Find Vc:

d) Find Vd: