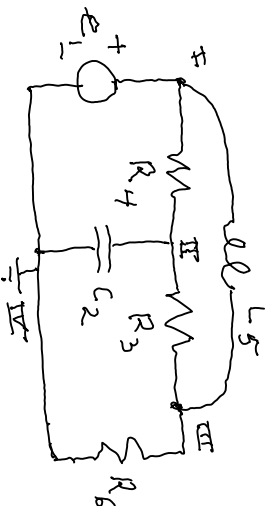


ENEE 610 Fall 2019 Homework 1 Due Tu 09/10/19

#1 (50 points; circuit graph theory)

For the following circuit

- a) Draw the graph numbering branches as component numbers and direct branches from left to right or down.
- b) Give the cut set and the set matrices for branches 1,2,3 for the tree.
- c) Give the (augmented) incidence matrix and from it determine how many trees the circuit graph has.



#2 (50 points, circuit description)

For the above circuit

- a) Give the  $A(s)v=B(s)i$  and  $i_b=i+i$  and  $v_b=e+v$  descriptions; use admittance form for the Rs & C and impedance form for L.
- b) Combine these three equations with the cut set and the set equations from problem #1 to get circuit equations in terms of the six variables,  $v_1$  and  $i_1$  with driving voltage  $e_1$ .

