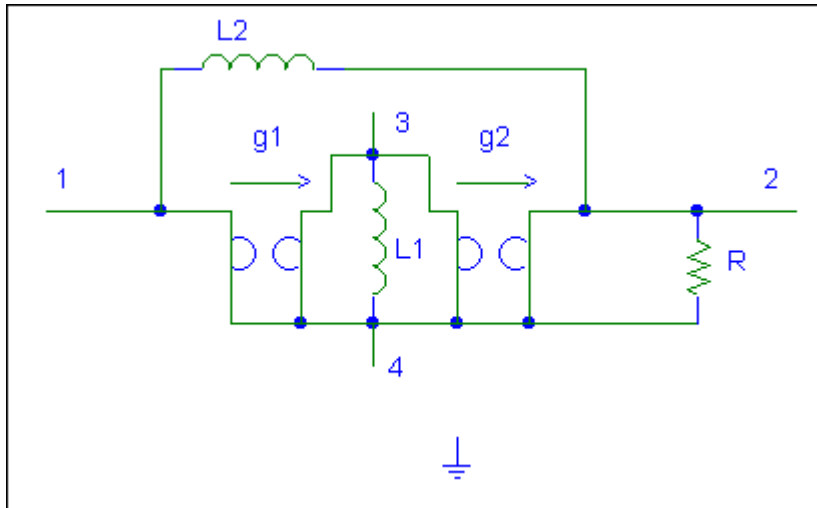ENEE 610
Homework Problems for Grading, Set 2 (100 points)
Due at class W 09/19/07
Indefinite Y and Incidence Matrix

These problems use the following circuit taken from Homework Set 1

1.(50 points)
    a) Using the node numbers indicated set up the indefinite admittance
       matrix Yind(s).
    b) Ground node 4 to get the nodal admittance matrix Ynode(s).
    c) Eliminate node 3, with ground still at node 4, to get the 2-port
       admittance matrix Y(s).

2. (50 points)
    a) For the circuit as drawn, give the oriented circuit graph [use the node
       numbering 1 through 4 as indicated and number the ground node 5].
       Assume branches 1 through 4 connect nodes 1 through 4 to ground,
       branches 5 & 6 are for g1 (left for 5), branches 7 & 8 are for g2 (left
       for 7), and branches 9, 10, 11 are for L1, L2, R, respectively, with all
       orientation arrows pointing down or to the right.
    b) Show that the graph can be made planar by a possible redrawing.
    c) Give the augmented incidence matrix A_a for the graph just found.
    d) The number of trees, n_T, of a graph is stated in problem 3.12 of Peikari to be
       given by
           $n_T = \det(A_a A_a^T)$
       Find the number of trees for this graph.