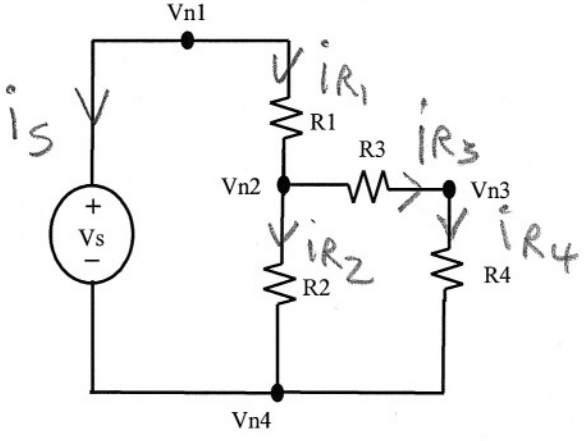
MASSACHVSETTS INSTITVTE OF TECHNOLOGY
Department of Electrical Engineering and Computer Science
6.01—Introduction to EECS I
Fall Semester, 2007

Quiz Week 7

Name: Solutions **Athena userid:** _____@mit.edu

Question: Write a list of constitutive equations and conservation laws (KCL equations) that can be used to determine all the voltages and currents in the circuit below. Be sure to label all your currents and their directions, and indicate which node is your ground node.



KCL

N1: $i_S + i_{R_1} = 0$

N2: $-i_{R_1} + i_{R_2} + i_{R_3} = 0$

N3: $-i_{R_3} + i_{R_4} = 0$

N4: Selected as ground

Constitutive

$V_{n_1} - V_{n_4} - V_S = 0$

$V_{n_1} - V_{n_2} - R_1 i_{R_1} = 0$

$V_{n_2} - 0 - R_2 i_{R_2} = 0$

$V_{n_2} - V_{n_3} - R_3 i_{R_3} = 0$

$V_{n_3} - V_{n_4} - R_4 i_{R_4} = 0$