

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 Department of Electrical Engineering and Computer Science
 6.01—Introduction to EECS I
 Spring Semester, 2008

What to Write for PS 8: Revised for Design lab

Question 1: Nothing

Question 2: Without changing anything else, what if we did:

```
c.solve('n1')
```

What changes in your solution? Is this solution physically different (could you see the difference with your multimeter) from what you got before? Explain.

Question 3: Nothing

Question 4: Nothing

Question 5: For this same version of the circuit (without the wire between n_2 and n_4):

- a. *Intuition:* If we were to take the voltage source in this same circuit, pull it out, and turn it around so that the terminals were connected the other way (without changing anything else), would that change the voltages and currents in the actual physical circuit, that is, the values that you can measure with your multimeter? Explain.
- b. *Using solver:* If you were to change the entry

```
Vsrc(vc, 'n2', 'n3')
```

to

```
Vsrc(vc, 'n3', 'n2')
```

What changes in the solution printed by Python (ignoring tiny numerical differences)? Is this solution physically different from (could you see the difference with your multimeter) what you got before? Explain.

Question 6: Draw circuits

Question 7: Nothing

Question 8: Roughly determine the smallest value of op-amp gain, K , for which

$$\frac{V_{\text{out}}}{V_{\text{in}}} = -\frac{R_f}{R_{\text{in}}}$$

is accurate to within ten percent. Explain how you did it.

Question 9: Nothing

Question 10: Nothing

Design Lab

Questions 15 and 16 will be made part of design lab 9 and should not be included in the lab 8 write-up. You will have time in lab 9 to finish your circuits if you didn't finish during design lab 8. If you didn't finish the circuits for questions 11 - 14 of this lab, though, you should come in and finish them during office hours and describe your results in the lab 8 write-up.

Question 11: Nothing

Question 12: Explain what happens with the motor.

Question 13: Explain what happens with the motor and, if it's different from the previous case, why.

Question 14: Draw a schematic diagram of your circuit. Show the voltage at the motor terminals when the potentiometer is at its two extreme positions.

Post-lab Homework

Use the circuit-solving software to help answer the questions. For each one, submit the the **Circuit** you constructed and the output it generated when you solved it. Show which values in the output correspond to answers to the questions we ask below. No further explanation is required.