

10/16/03

EE 42 – Introduction to Electronics for Computer Science

Fall 2003,
Dept. EECS, 510 Cory
UC Berkeley
Course Web Site

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Problem Set # 7

Due: 1 PM Oct 22nd, 2003 in box outside 240 Cory

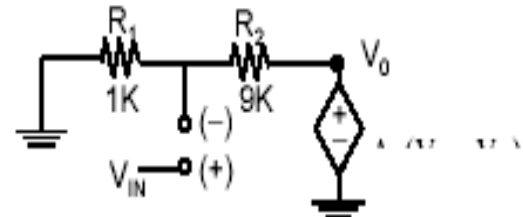
Announcement:

Reading Week #7: Review Schwarz and Oldham 4.1, 4.2, 4.3

Topics: Circuit Analysis with dependent sources and operational amplifiers.

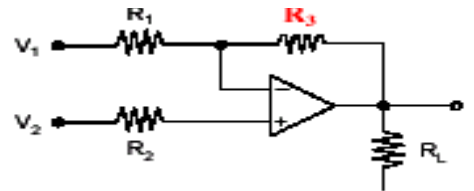
7.1 Dependent Sources Use the circuit to the right. The dependent source on the graph is $A(V_+ - V_-)$

- Find V_o
- Is the gain (V_o/V_{IN}) greater than unity?



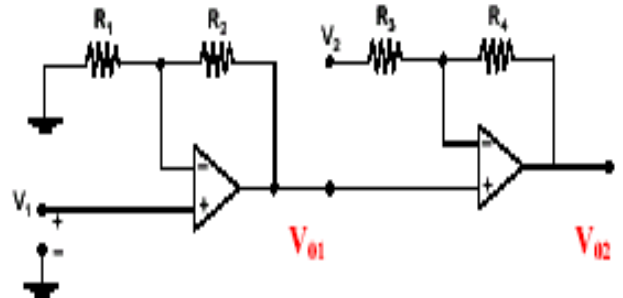
7.2 Ideal Op-Amp Use the circuit to the right.

- Find V_{out} in terms of V_1 , V_2 and the resistances
- Explain why the value of V_{out} is independent of R_L
- Explain why the value of V_{out} is independent of R_2



7.3 Cascade Op-Amps Use the circuit to the right.

- Find an expression for V_{o1}
- Find an expression for V_{o2}



7.4 Dependent Sources Use the circuit to the right.

NOTE: V_{DD} is a D.C. (constant) voltage source and thus does not need to be included in the analysis and in fact can be considered an a.c. ground that grounds the top end of the current source and R_O ; Be sure to assume the output is shorted; Leave R_O in your analysis (even though it is not present in the solution that you are not supposed to be looking at).

- Use KCL, find V_E
- Find the voltage across the AA' terminal, V_{test}
- Find the resistance seen looking into AA'

