UNIVERSITY OF CALIFORNIA
College of Engineering
Department of Electrical Engineering
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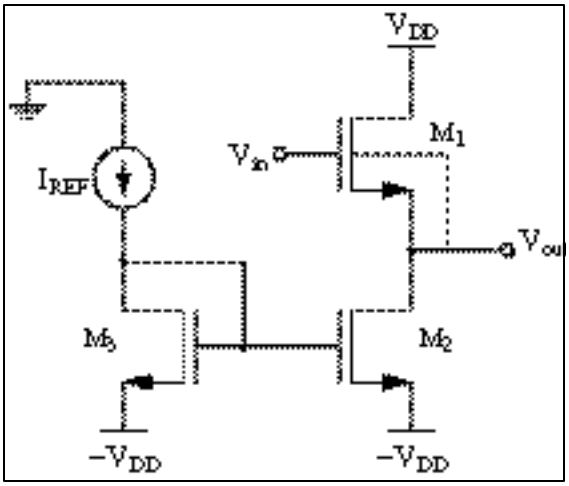
EECS 140
Fall 2004

PROBLEM SET #6

(Due 11/17/04)



1) For the circuit above, assume all wells are tied to their respective sources. V_{DD}=1.8 V. All W/L=6/0.18. I_{REF}=100 μA. V_{IN} is set so that the output is biased at 0 V. Use the following device model:

```
.model nch nmos LEVEL=1 TOX=25 VTO=0.5 KP=140.0e-6 LAMBDA=0.1
+GAMMA=0.5 PHI=0.6
```

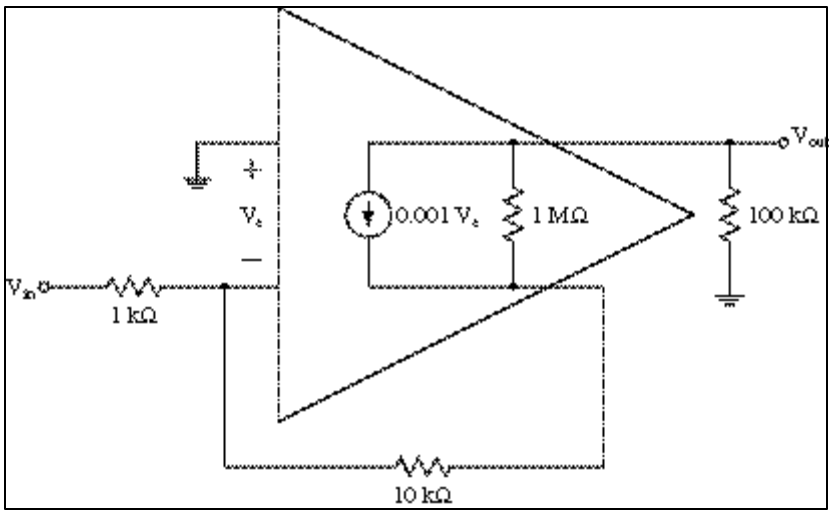
In this problem, use the feedback circuit techniques developed in class to analyze the above source follower.

a) What kind of feedback is it?

b) Find an expression for the feedback factor, f.

c) Give an expression for the loop gain, T, with loading, and calculate the value.

d) Give expressions and calculate v_{out}/v_{in} and R_{out} using the feedback formulas and compare to the exact expressions.



2) For the circuit above, determine the following:

a) What kind of feedback is it?

b) Find the feedback factor, f.

c) Find R_{out}.

d) Find v_{out}/v_{in}.

e) Use SPICE to check your answers for parts (c) and (d). Macromodel the opamp using .subckt.