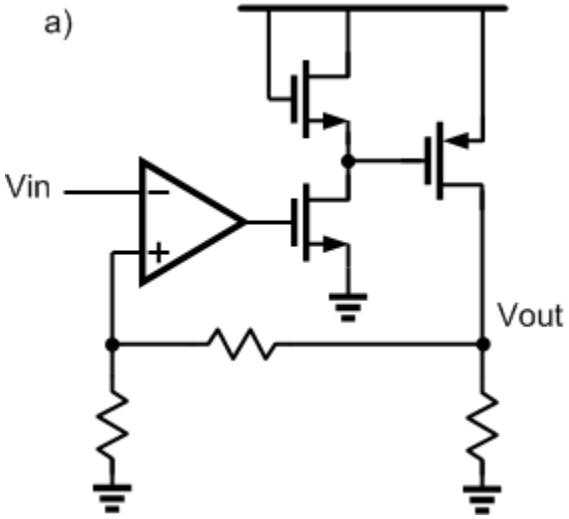
ECE323

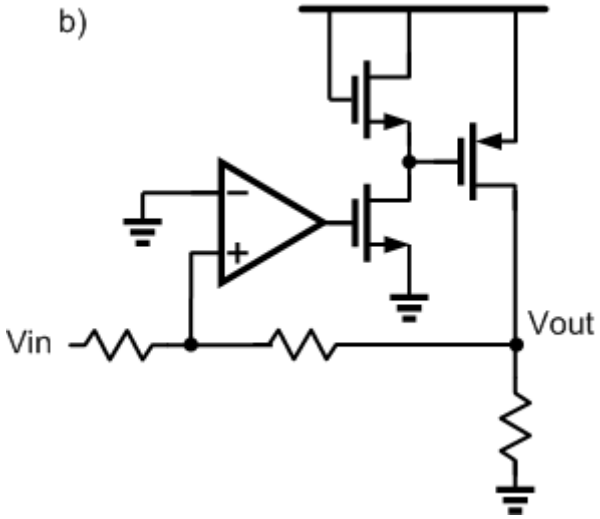
Homework 5

1. Determine the polarity of the feedback circuits shown below.

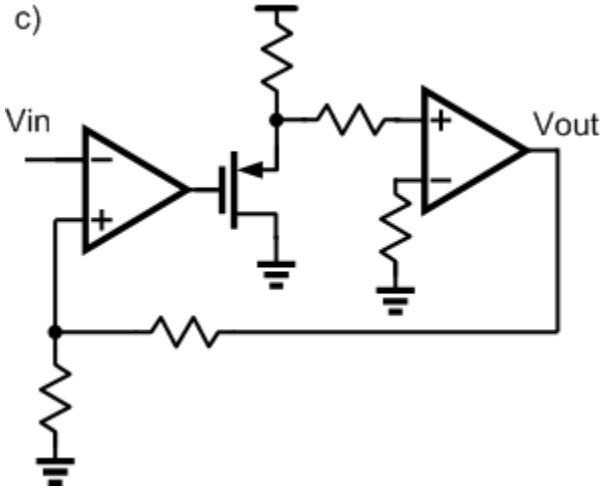
a)



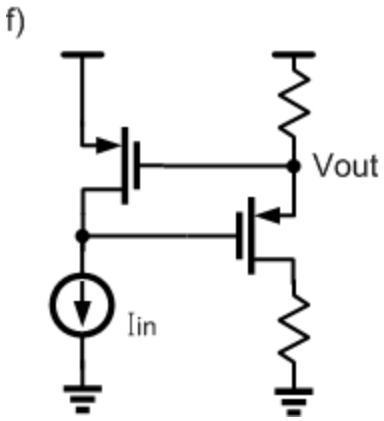
b)



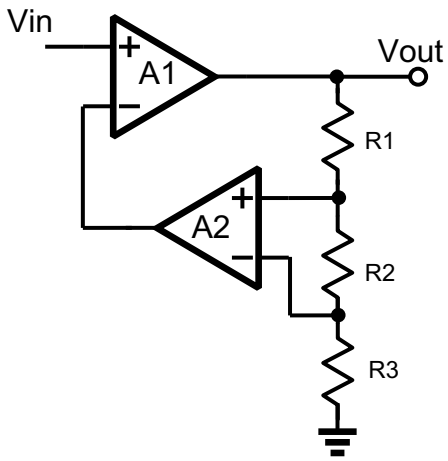
c)



f)

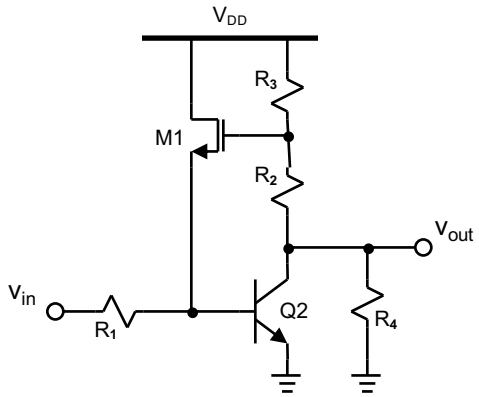


2. Compute the closed loop gain of the circuit shown below. Assume opamps have finite gain of A1, A2, but are otherwise ideal.

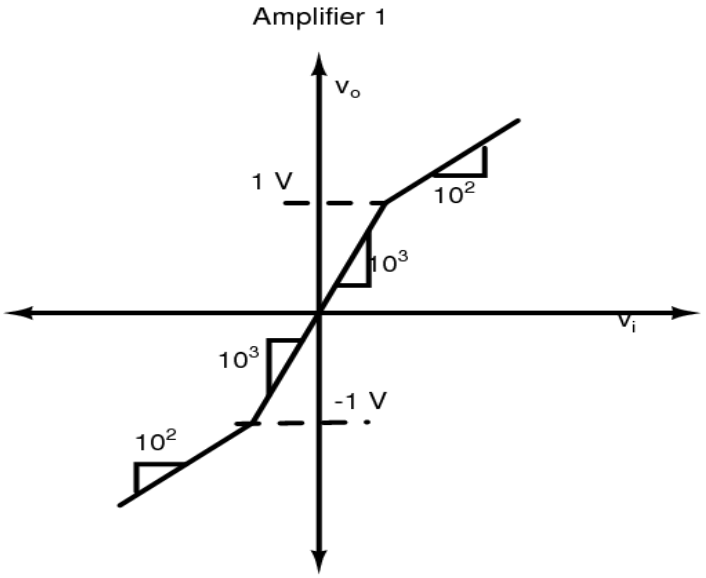


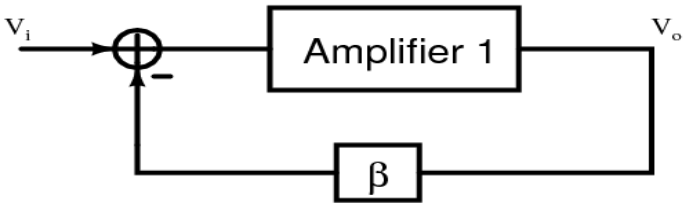
3. In problem 2, assume opamp A1 has a transfer function $H_{OL}(s) = \frac{A1}{1 + s/\omega_p}$, determine the closed loop -3dB bandwidth.

4. Find the input-to-output small-signal gain.



5. A realistic amplifier can be modeled by the following non-linear transfer function. For this amplifier, the open-loop gain changes from 1000 to 100 for output voltage larger than 1 V. Find the feedback factor (β) to be used in the closed loop amplifier shown below such that, the closed loop gain varies only by 10%, when the output voltage is above and below 1V. What is the transfer characteristic of the resulting closed-loop feedback amplifier?





6. Find the input-to-output small-signal gain.