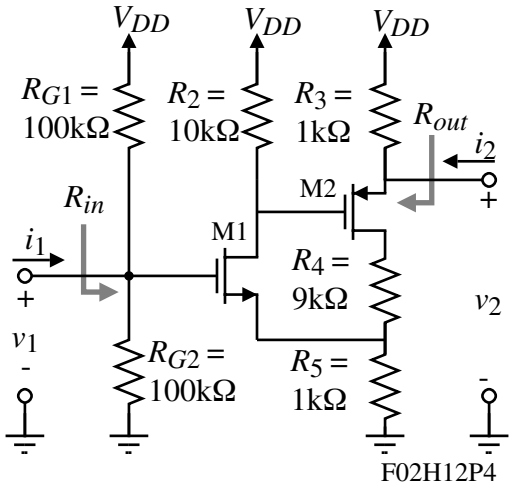
Homework Assignment No. 13

Due on Monday, April 12, 2004

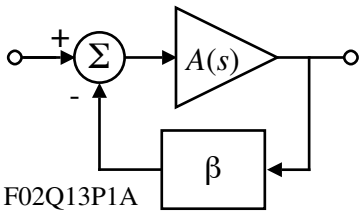
1.) Use the method of feedback analysis to find the numerical values of v_2/v_1, $R_{in} = v_1/i_1$, and $R_{out} = v_2/i_2$. Assume that all transistors are matched and that $g_{m1} = g_{m2} = 1\text{mS}$. Neglect r_{ds} of the transistors.



Ans. [$v_2/v_1 = -0.714\text{V/V}$, $v_1/i_1 = 50\text{k}\Omega$, and $v_2/i_2 = 857\Omega$]

2.) The amplifier in the feedback circuit shown has a transfer function of

$$A(s) = \frac{100}{\frac{s}{10^5} + 1}$$



What value of β will increase the upper –3db frequency by a factor of 10 for the closed loop gain? What is the closed loop, low frequency gain?

Problems in ( ) correspond to the first edition.

3.) Problem 18.40 (18.35) of the text.

4.) Problem 18.59 (18.32 there is some difference between 1st and 2nd edition) of the text.

5.) Problem 18.62 (18.30) of the text.