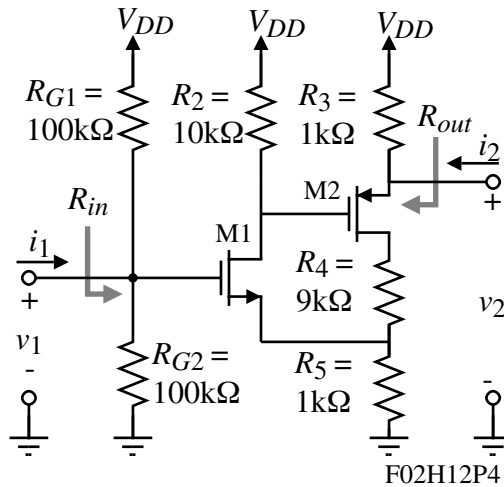## Homework Assignment No. 13

Due on Wednesday, April 16, 2003
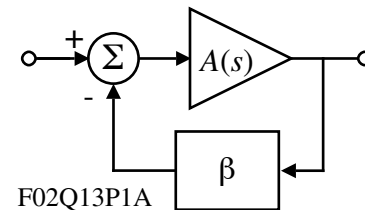
1.) Use the method of feedback analysis to find the numerical values of $v_2/v_1$, $R_{in} = v_1/i_1$, and $R_{out} = v_2/i_2$. Assume that all transistors are matched and that $g_{m1} = g_{m2} = 1$mS. Neglect $r_{ds}$ of the transistors.



F02H12P4

Ans. [$v_2/v_1$ = -0.714V/V, $v_1/i_1$ = 50kΩ, and $v_2/i_2$ = 857Ω]

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



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

F02Q13P1A

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

3.) Problem 18.30 of the text.

4.) Problem 18.32 of the text.

5.) Problem 18.35 of the text.