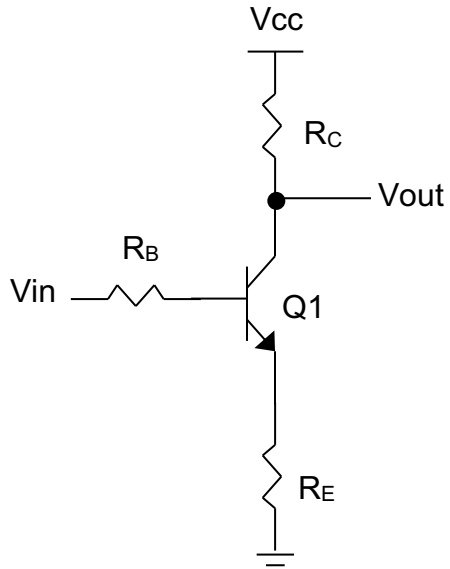


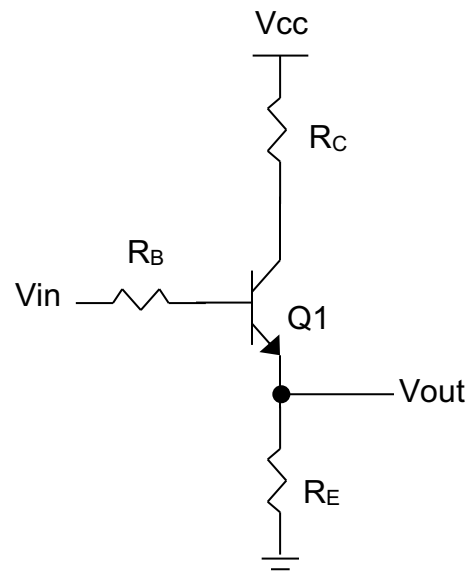
ECE 323 HW # 3

Prob. 1-3: Find the expression for small signal R_{in} , G_m , R_{out} and Gain for all the circuits. Assume all the BJTs are biased in forward active region and MOSFETs in saturation. Consider $r_o = \infty$

Prob.1

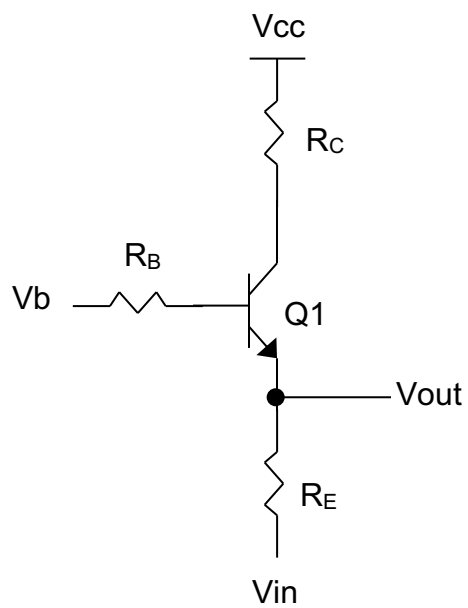


(a)

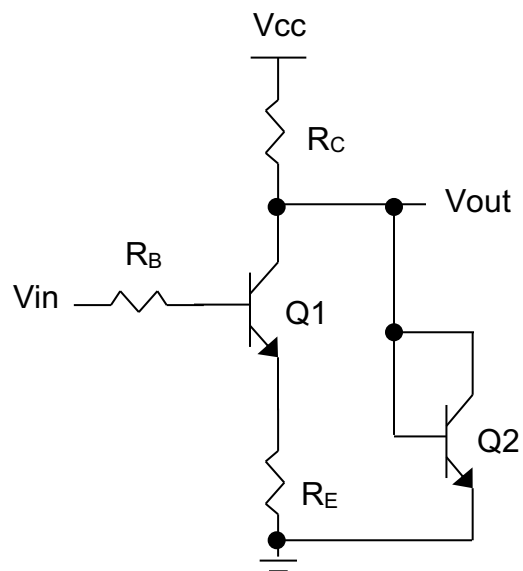


(b)

ECE 323 HW # 3

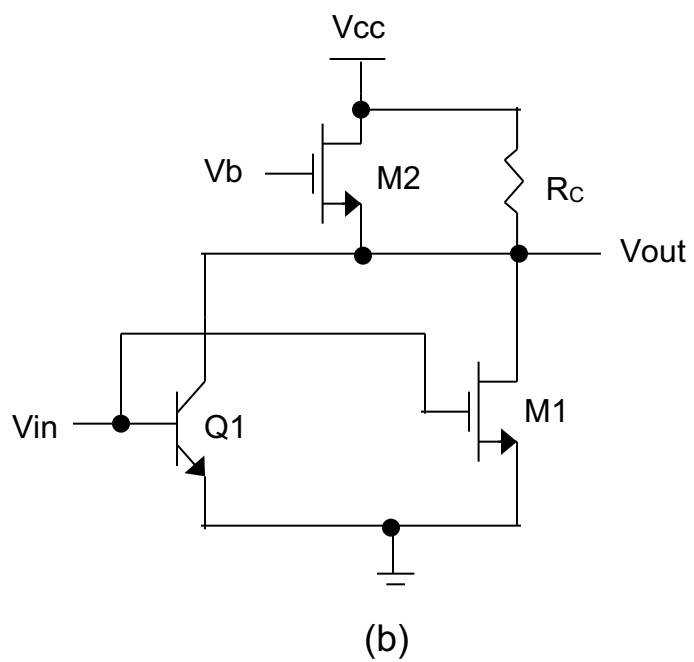
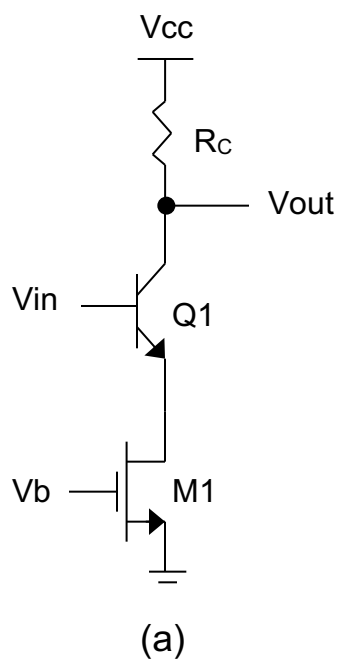


(c)

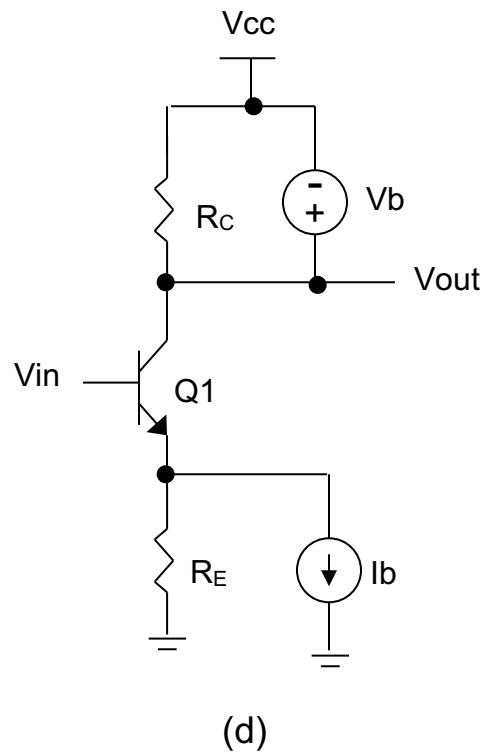
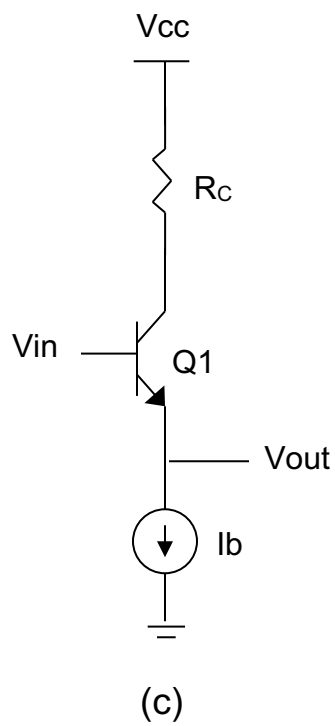


(d)

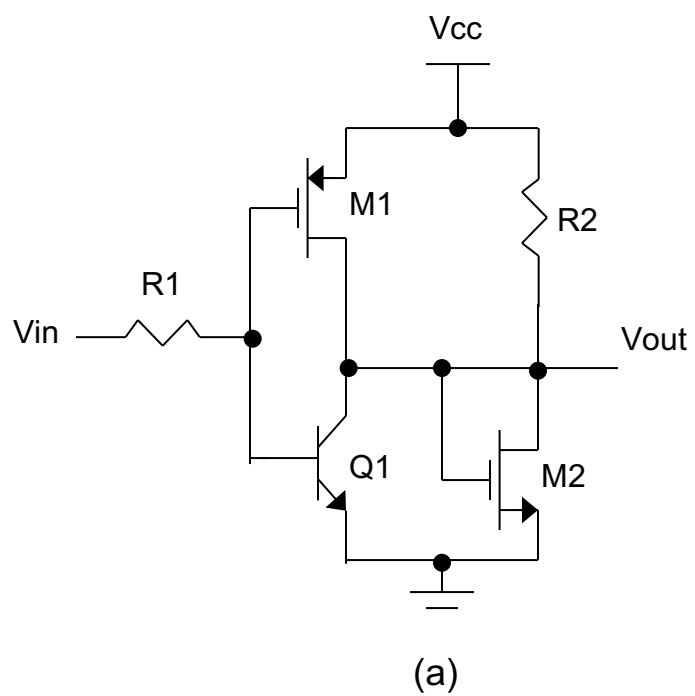
Prob.2



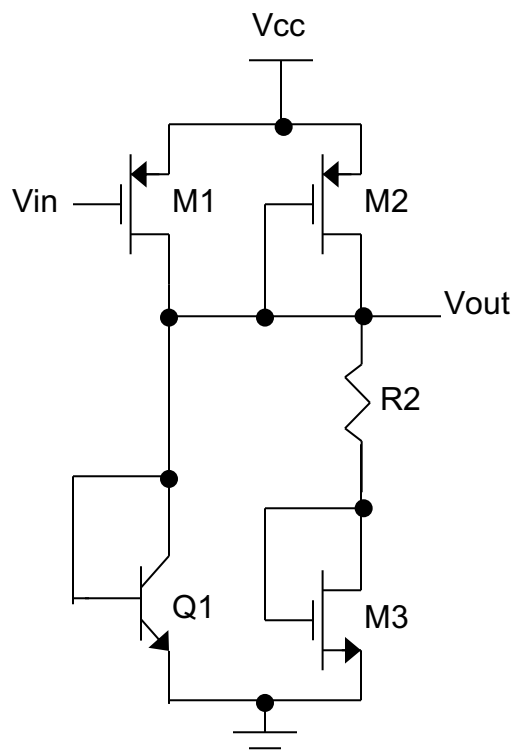
ECE 323 HW # 3



Prob. 3



ECE 323 HW # 3

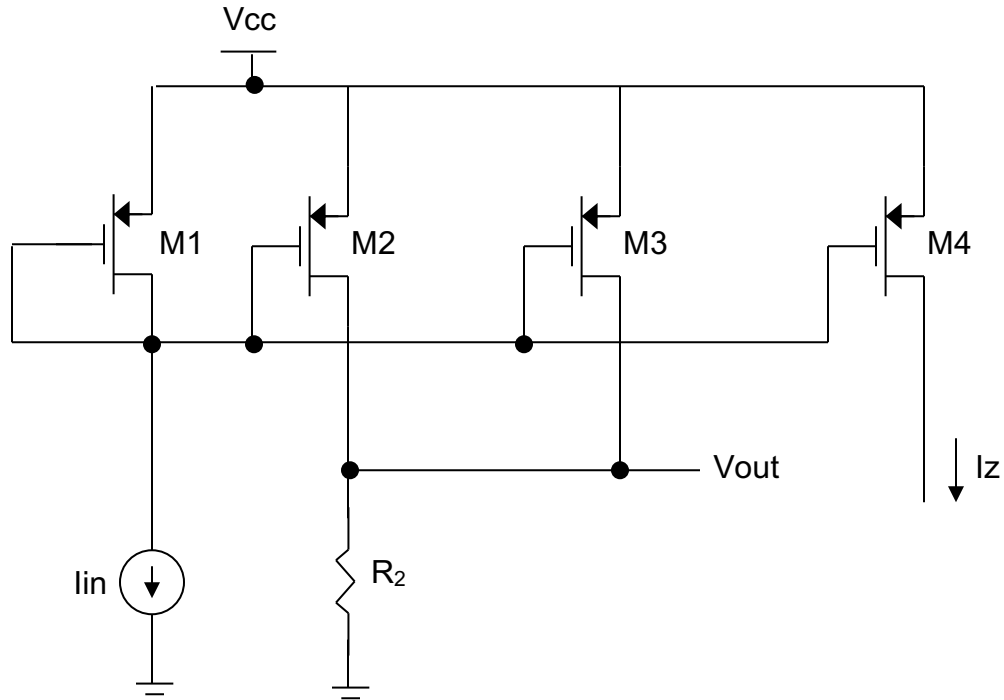


(b)

ECE 323 HW # 3

Prob. 4

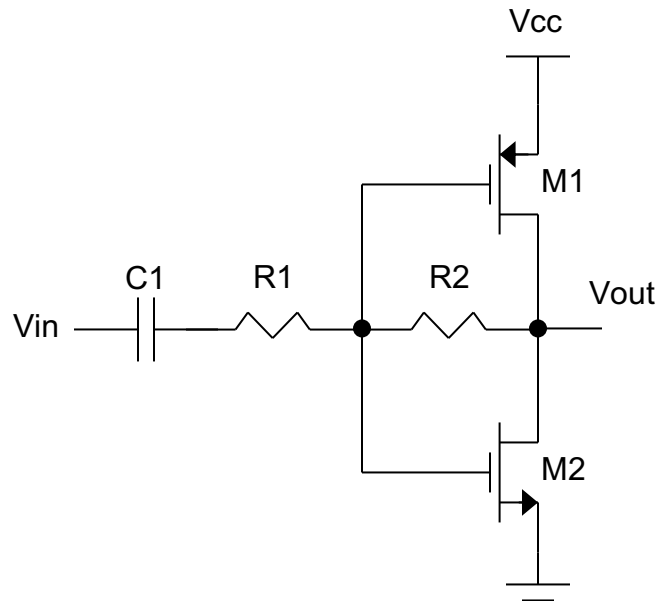
For the circuit given below, find the expression for output resistance R_{out} , transimpedance V_{out}/I_{in} and current gain I_z/I_{in} . Assume all the MOSFETs having same W/L and operating in saturation region. Consider $r_o = \infty$



ECE 323 HW # 3

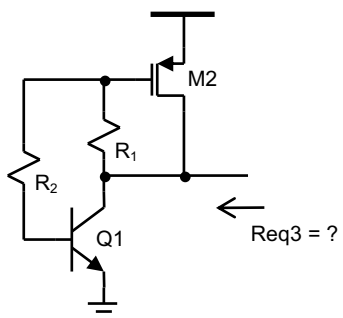
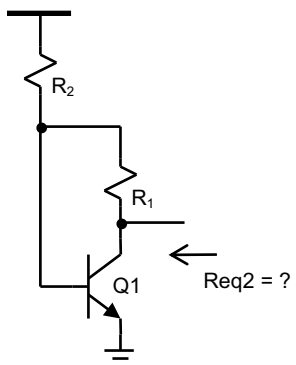
Prob. 5

For the circuit given below, find the expression for R_{in} , R_{out} , G_m and gain. Assume all the MOSFETs operating in saturation region and consider $r_o = \infty$. Plot the behavior of output gain vs R_2 .



Prob. 6

Find Req2 and Req3



Prob. 7

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

