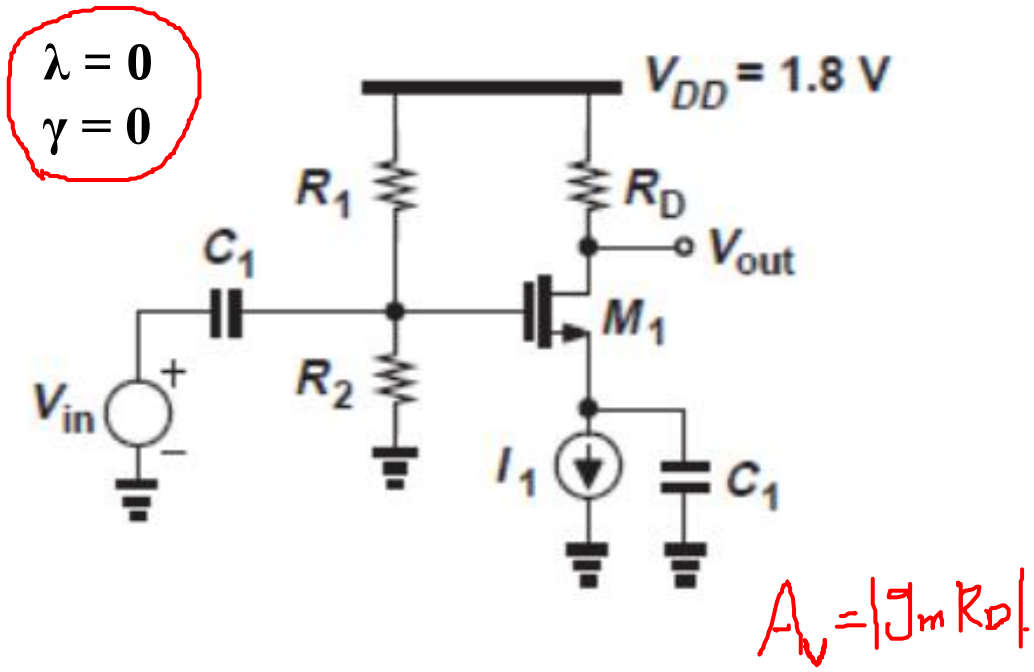
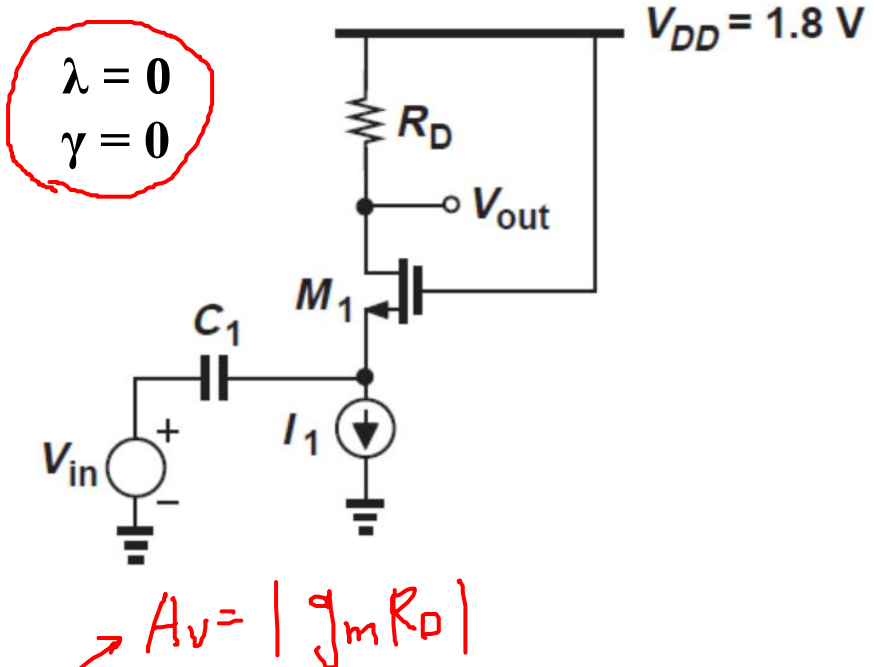
Quiz 3.1 In the common-source stage shown below, the drain current of M_1 is defined by the ideal current source I_1 and remains independent of R_1 and R_2. Suppose I_1 = 1 mA, R_D = 500 Ω. $\mu_n C_{ox} = 200\ \mu A/V^2$, V_{th} = 0.4 V.



(a) Compute the value of W/L to obtain a voltage gain of 5.
(b) Choose the values of R_1 and R_2 to place M_1 200 mV away from the triode region while R_1 + R_2 draws no more than 0.1 mA from the supply.

Quiz 3.2 The CG amplifier shown below is biased by means of I_1 = 1 mA. V_{th} = 0.4 V.



(a) What value of R_D places the transistor M_1 100 mV away from the triode region?
(b) What is the required W/L if the circuit must provide a voltage gain of 5 with the value of R_D obtained in (a)?

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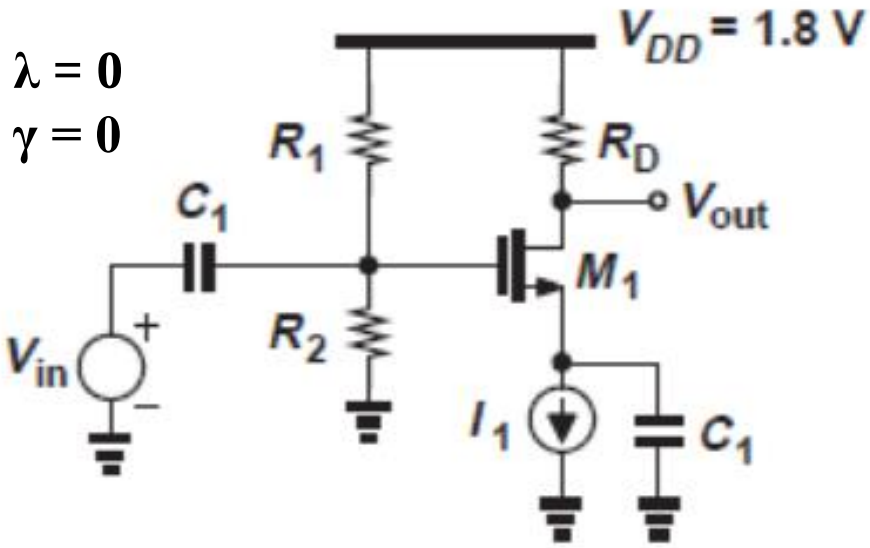
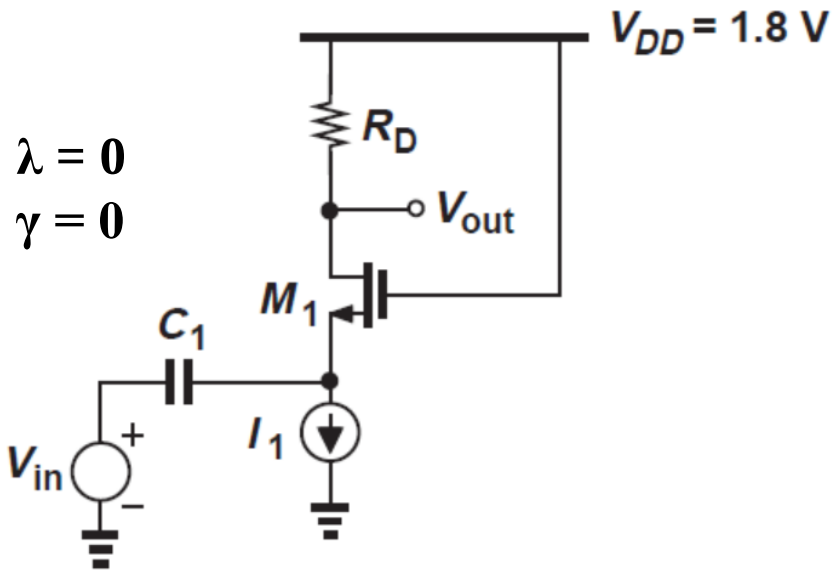


(a) Compute the value of W/L to obtain a voltage gain of 5.

(b) Choose the values of R_1 and R_2 to place M_1 200 mV away from the triode region while $R_1 + R_2$ draws no more than 0.1 mA from the supply.

Quiz 3.2 The CG amplifier shown below is biased by means of I_1 = 1 mA. V_{th} = 0.4 V.



(a) What value of R_D places the transistor M_1 100 mV away from the triode region?
(b) What is the required W/L if the circuit must provide a voltage gain of 5 with the value of R_D obtained in (a)?