Problem Practice 2

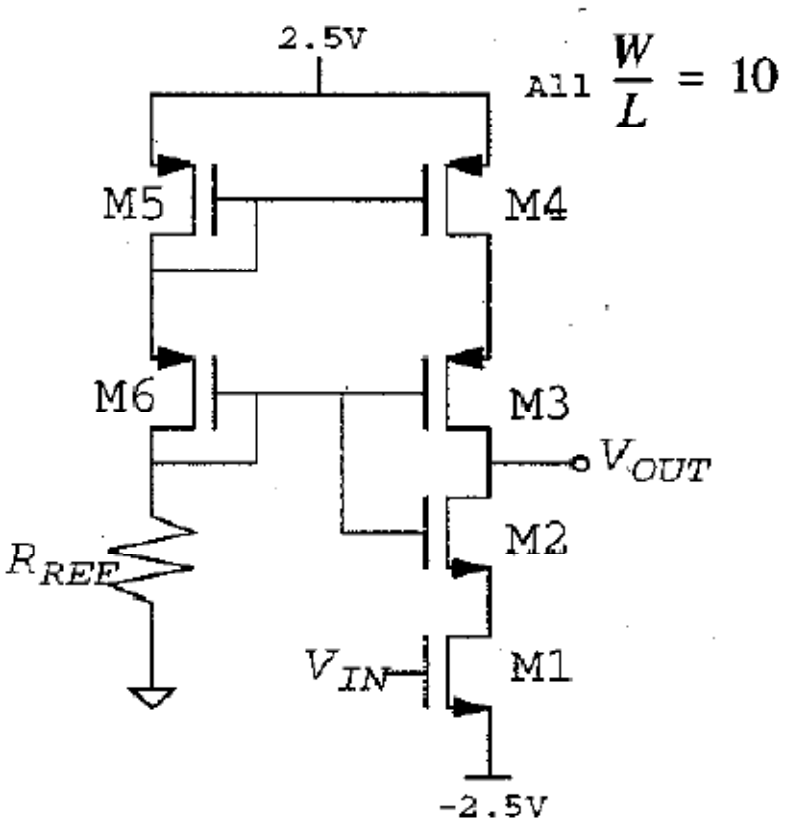
Differential Pairs and Current Sources

Problem 1. A) What is R_{REF} So that I_{DS_M6} = 10uA ?

B) What is the Maximum Voltage Swing at the Vout ?

C) What is the output resistance ?

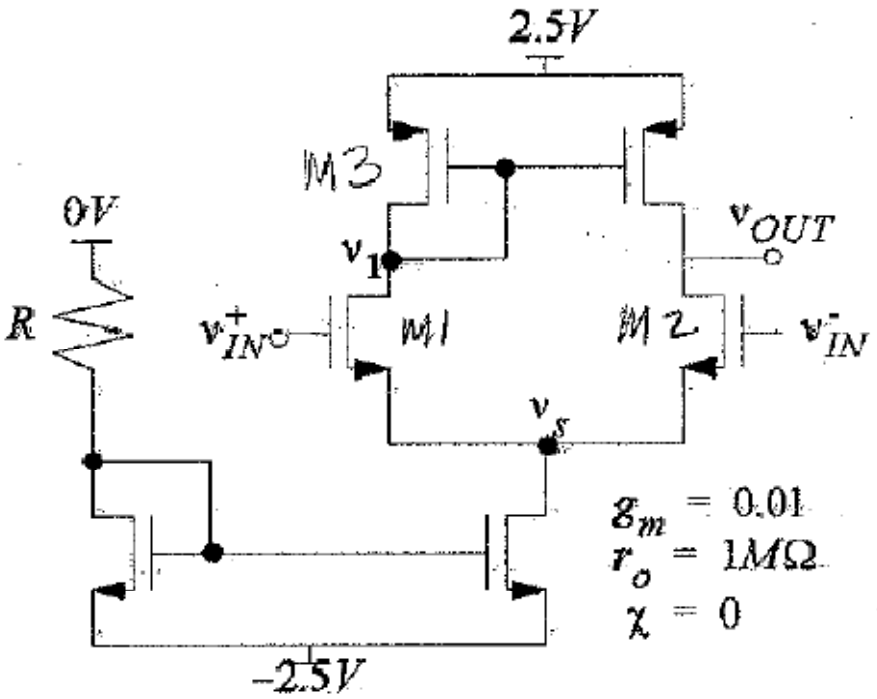
D) What is the gain ?



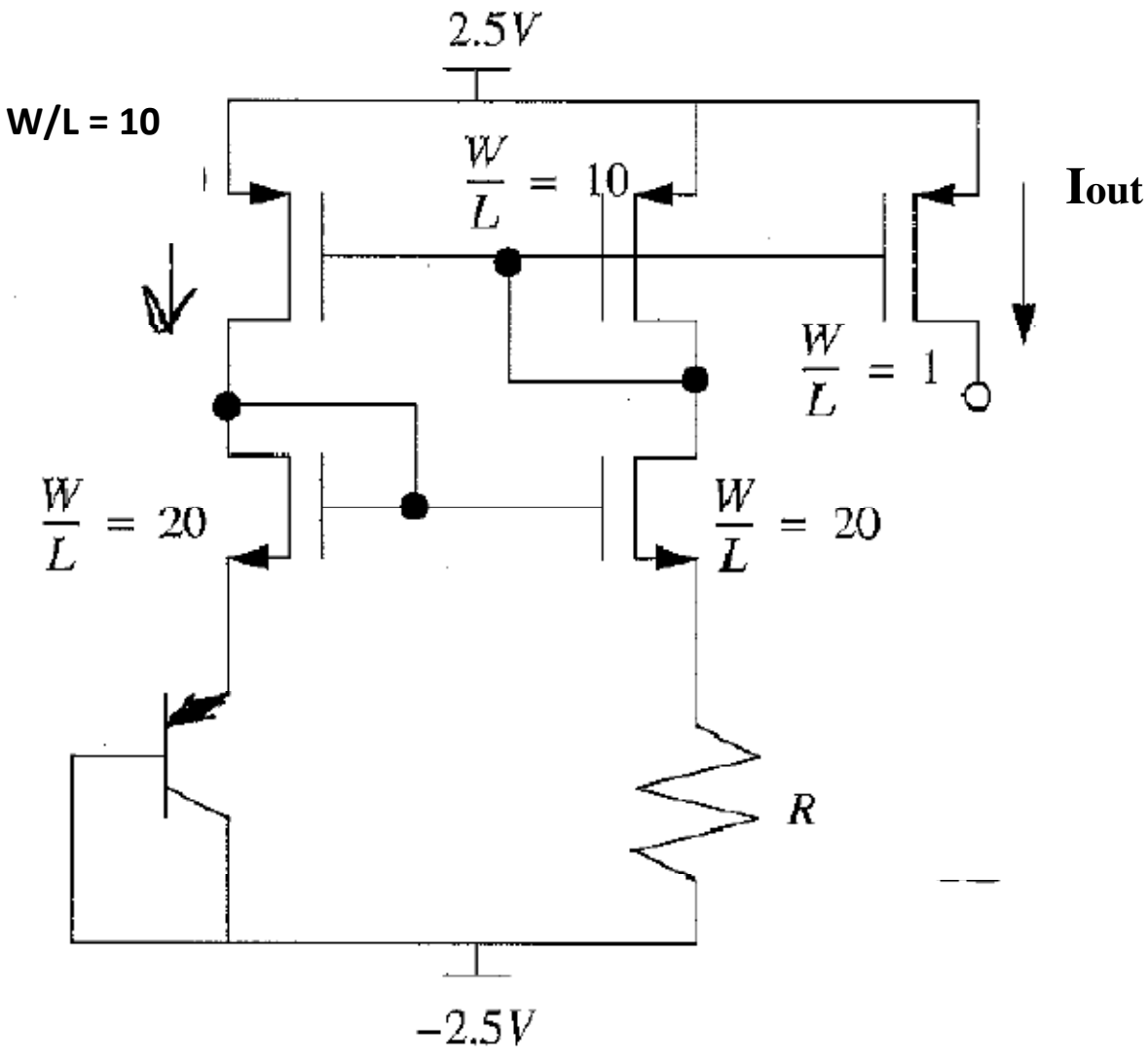
Problem 2 1) If VIN+ = VIN- = VIN, what is Vs/VIN ?

2) If VIN+ = 0V and VIN- = VIN, what is Vs/VIN ?

3) If VIN+ = VIN/2 and VIN- = -VIN/2, What is V1/VIN ?



Problem 3 What is the value of R so that Iout = 100uA ?



Problem 4. What is Vout,max ? What is Vout,min ? If R is chosen so that current through M1 is 0.1mA, what is the efficiency of this circuit assuming the output must be centered around 0V ?