

## **E338 Homework 5 The Inverter**

\*\*KP and Vth can be found in cmosedu\_model.txt

1. Build an inverter in LTSpice that has a switching point of 2.5 V. (use the 1u technology for both PMOSes and NMOSes, set the W/L on your own as long as the switching point is 2.5V. VDD is 5V). Show the calculation that guides to the W/L design. (30 points)
2. Use LTSpice to show NMOS passes 0 better and PMOS passes 1 better. Then use a transmission gate to show that both 0's and 1's can be passed through. (30 points) (use the 1u technology).
3. Build a NAND gate in LTSpice and put it into a symbol. Simulate the NAND logic in LTSpice. (40 points) (use the 1u technology)