**Homework 1**
Due February 3rd

1. A CMOS inverter has a switching threshold of 2.5V and V_{DD}=5V. We want to reduce the switching threshold to 1.33 V by changing the width(s) of either or both of the transistors. Should we increase or decrease the width(s) and which of the two transistors do you change? Assume that $V_{Tn} = -V_{Tp} = 1$ V. Assume the standard model not including short channel effects.

2. Using the short channel model, find the drain current and V_{out} for the following circuit for three different input voltages: V_{in}=0V, V_{in}=1.67V, V_{in}=3.3V. V_{Tn}=.7V, V_{DSATn}=1.0V and k_n=.2 mA/V^2
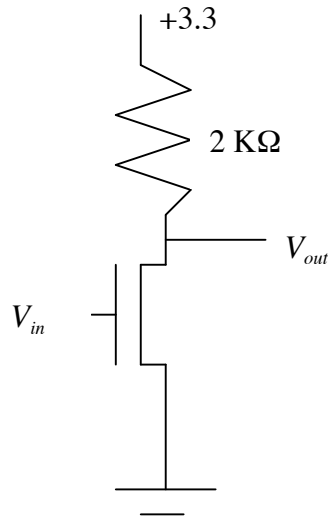
3. What are the advantages of a CMOS inverter compared to a static load nMOS inverter? Disadvantages?