HW2 Notes

Problem 1. Right underneath Fig. 1 in problem 1, there is the sentence,

"Discuss why the two curves are different. Use mathematical equations whenever possible to make your point."

A number of you did not notice this and left it out.

Problem 3.
a. I was a little glib λ. λ is obtained from the slope of the $I_D - V_{DS}$ curve in saturation. It is not exactly the slope (the units are wrong). If you extend the saturated part of the $I_D - V_{DS}$ curve back to the current axis (using a straightedge), it will intersect the current axis at a value, say I_{D0}. λ is the slope $(dI_D / dV_{DS}) / I_{D0}$. When you are fitting the curve, and you need more slope in saturation, increase λ.

b. The values for KP in the SPICE level 3 parameters are a rough starting point. The current is directly proportional to KP. If the current is consistently too high, reduce KP. The slope in the linear region for small V_{DS} is also proportional to KP.

c. The SPICE level 3 parameter VTO provides a reasonable starting point. You can fit VTO by matching the low V_{GS} curve, V_{GS} = 1V, when you can be sure to be in normal saturation.

d. For VDSAT, match the V_{GS} = 5V curve.