UNIVERSITY OF CALIFORNIA AT BERKELEY
College of Engineering
Department of Electrical Engineering and Computer Science

R. W. Brodersen	**Homework #1**	**EECS 140**
Johan Vanderhaegen	**(Due 9/4/02)**	**Fall 2002**

1) An NMOS transistor has parameters W = 10 μm, L = 0.25 μm, k' = 200 μA/V^2, λ = 0.01 V^{-1}, V_{T0} = 0.5 V, ϕ_f = 0.3 V and γ = 0.5 V$^{1/2}$.

   a) Sketch the I_D-V_{DS} characteristics for V_{DS} from 0 to 2.5 V and V_{GS} = 1.5 V, 2.5 V. Assume V_{BS} = 0 V.
   b) Sketch the I_D-V_{GS} characteristics for V_{GS} from 0 to 2.5 V and V_{DS} = 1V and 2.5 V. Assume V_{BS} = -1 V.

2) Using figure 1, estimate the model parameters V_{T0}, γ, k' and λ. Assume W/L = 100 and ϕ_f = 0.3 V. Explain your method.

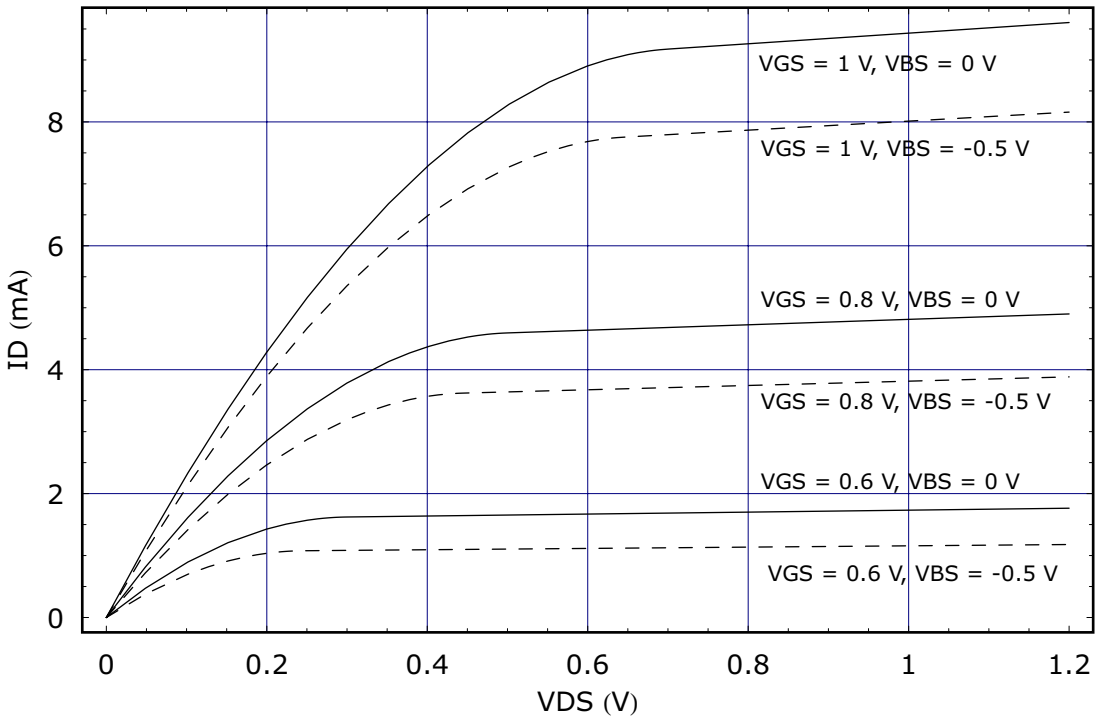

Figure 1