EE-320 Exercise 2

1. For W = 50 μm, L_{drawn} = 0.5 μm, L_D = 0.08 μm, plot the drain current of an NFET as a function of V_{GS} as V_{GS} varies from 0 to 3 V. Assume that V_{DS} = 3 V, $\mu_n C_{ox}$ = 50 μA/V^2, λ = 0.1 V^{-1}, and V_{TH} = 0.7 V.

2. Find an expression for the I_X and the transconductance of M_1 as a function of V_X as V_X varies from 0 to 1 V. Assume V_{DD} = 3 V, V_B = 0, λ = 0.1 V^{-1}, γ = 0.45 V$^{1/2}$, $2\Phi_F$ = 0.9 V, V_{TH0} = 0.7 V.