Quiz for Lesson 27

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Electronic Circuits 1
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Prob. 1

Plot I_D vs V_{DS} in an NMOS for several different values of V_{GS}'s when $V_{GS}>V_{TH}$. Include the channel length modulation effect. Explain the meaning of λ and g_m in your plot.

Prob. 2

Values for following parameters of an NMOS in saturation are known: V_{GS}, V_{DS}, μ_n, C_{OX}, W/L, V_{TH}. How should a circuit designer change above parameter values in order to increase the transconductance by factor of two? Give two different methods. Do not consider the channel length modulation effect.

Prob. 3

Determine the numerical value of the transconductance of M_1 in the following circuit. Use $\mu_n C_{ox}$ = 100μA/V^2 and V_{TH} = 0.4V. Do not consider the channel length modulation effect.