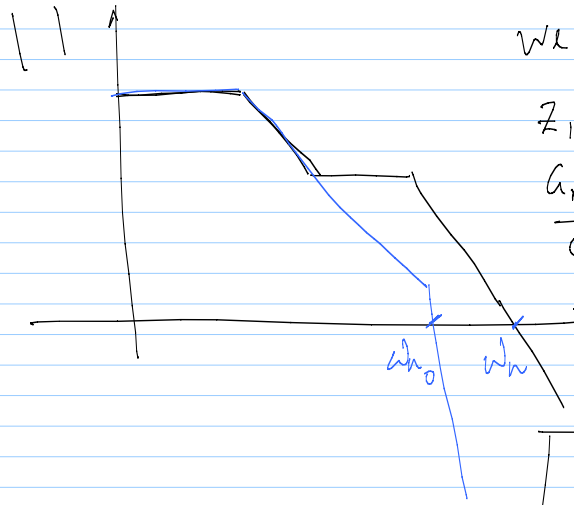
28/8/14

Lec 15

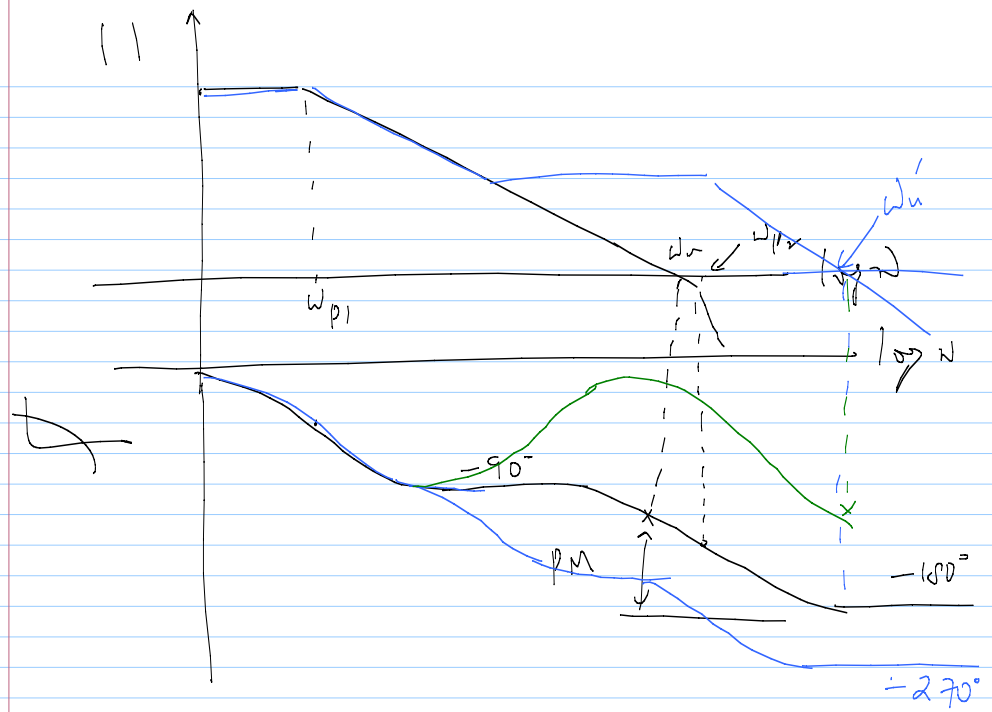


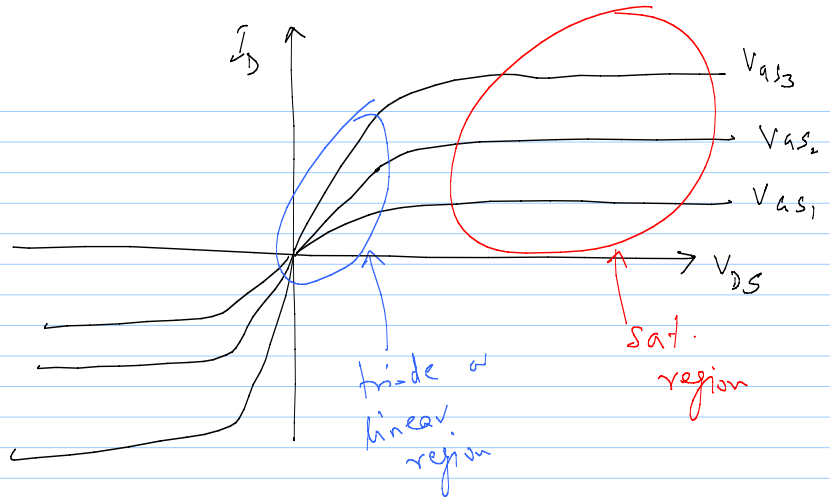
We want

$Z_1 \gg \omega_u$

$\frac{G_{m_2}}{C} \gg \frac{G_{m_1}}{C}$

$G_{m_2} \gg G_{m_1}$





$$I_D = \frac{1}{2}\mu_n C_{ox}\left(\frac{W}{L}\right)(V_{GS}-V_T)^2(1+\lambda V_{DS})$$ in sat. region

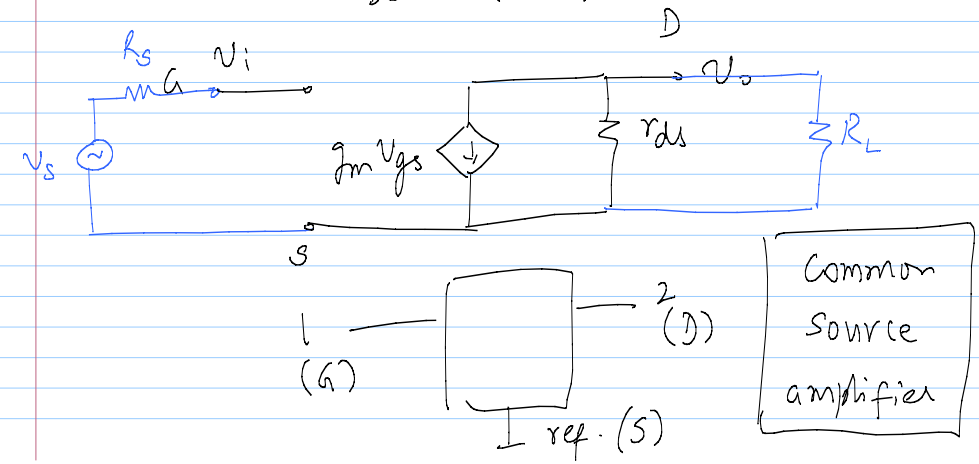
$V_{GS} > V_T \leftarrow I_D > 0$

$V_{DS} > V_{GS} - V_T$

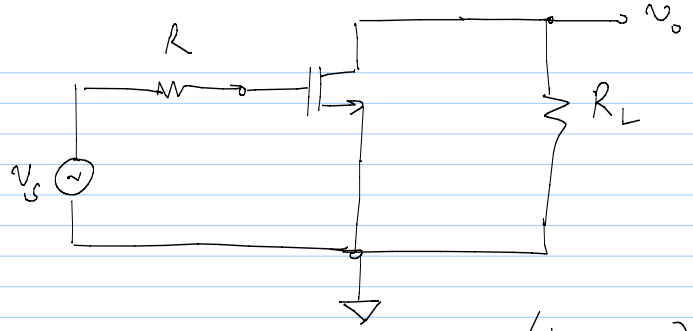
$$I_D = \mu_n C_{ox}\left(\frac{W}{L}\right)\left[(V_{GS}-V_T)V_{DS} - \frac{V_{DS}^2}{2}\right]$$ in triode region

$V_{GS} > V_T$

$V_{DS} \leq V_{GS} - V_T$



Common source amplifier



We need to choose (V_{GS}, V_{DS}) such that

$V_{GS} > V_T$ so that $I_D > 0$

$V_{DS} > V_{GS} - V_T$ sat. region