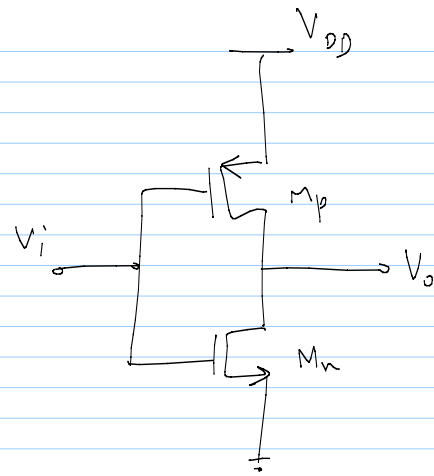
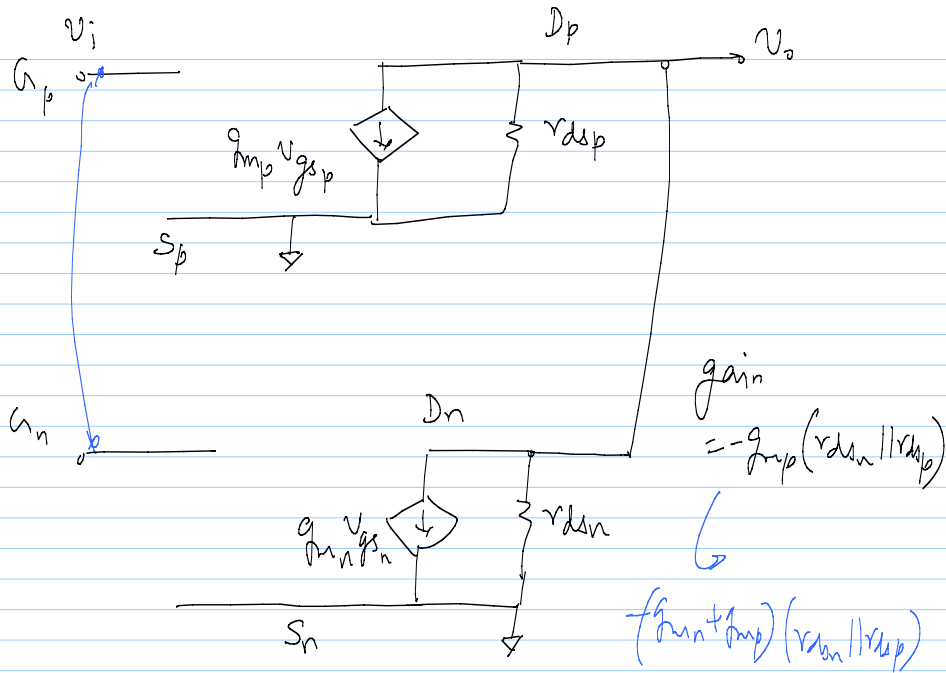
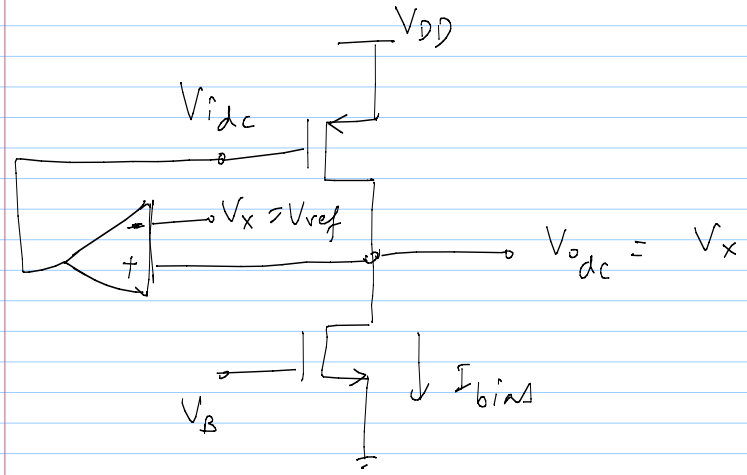
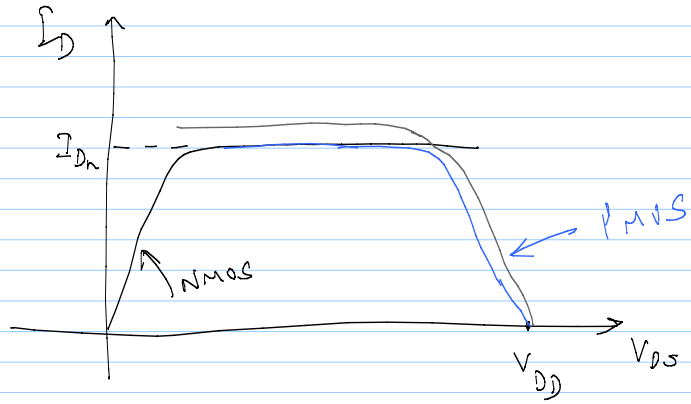
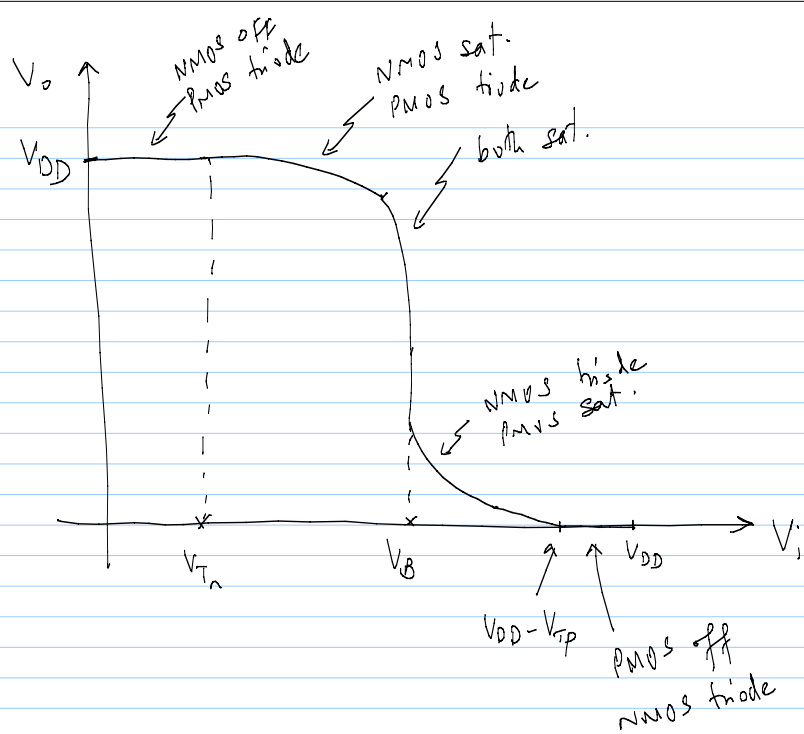


14/10/14

lec 33





$$\frac{1}{2} \mu_n C_{ox} \left(\frac{W}{L}\right)_n (V_B - V_{Tn})^2$$

$$= \frac{1}{2} \mu_p C_{ox} \left(\frac{W}{L}\right)_p (V_{DD} - V_B - V_{Tp})^2$$

$$(V_B - V_{Tn}) = \sqrt{\frac{\mu_p \left(\frac{W}{L}\right)_p}{\mu_n \left(\frac{W}{L}\right)_n}} (V_{DD} - V_B - V_{Tp})$$

$$V_B \left[1 + \sqrt{\frac{\left(\frac{W}{L}\right)_p}{\left(\frac{W}{L}\right)_n}} \right] = V_{Tn} + (V_{DD} - V_{Tp}) \sqrt{\frac{\left(\frac{W}{L}\right)_p}{\left(\frac{W}{L}\right)_n}}$$

$$V_B = \frac{V_{Tn} + (V_{DD} - V_{Tp}) \sqrt{\frac{\mu_p \left(\frac{W}{L}\right)_p}{\mu_n \left(\frac{W}{L}\right)_n}}}{1 + \sqrt{\frac{\mu_p \left(\frac{W}{L}\right)_p}{\mu_n \left(\frac{W}{L}\right)_n}}}$$

$$\mu_n \approx 3\mu_p$$

$$\left(\frac{W}{L}\right)_p \gg \left(\frac{W}{L}\right)_n \Rightarrow V_B = V_{DD} - V_{Tp}$$

$$\left(\frac{W}{L}\right)_n \gg \left(\frac{W}{L}\right)_p \Rightarrow V_B = V_{Tn}$$