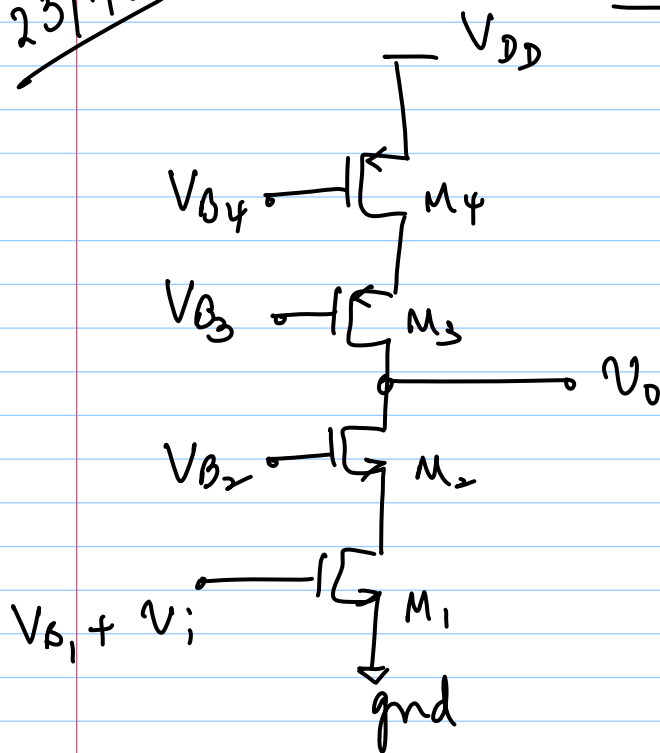
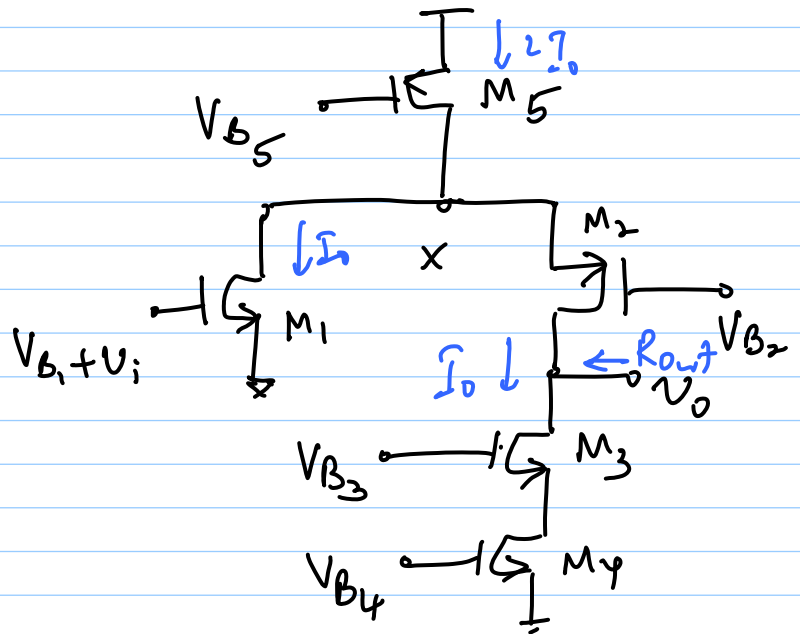


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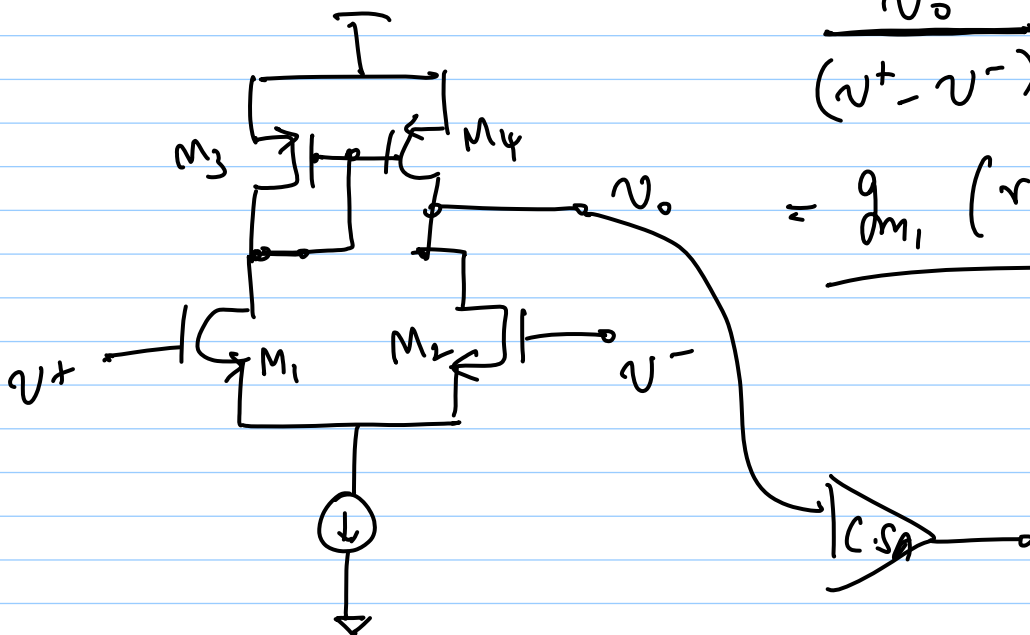
# Lec 6



I



II



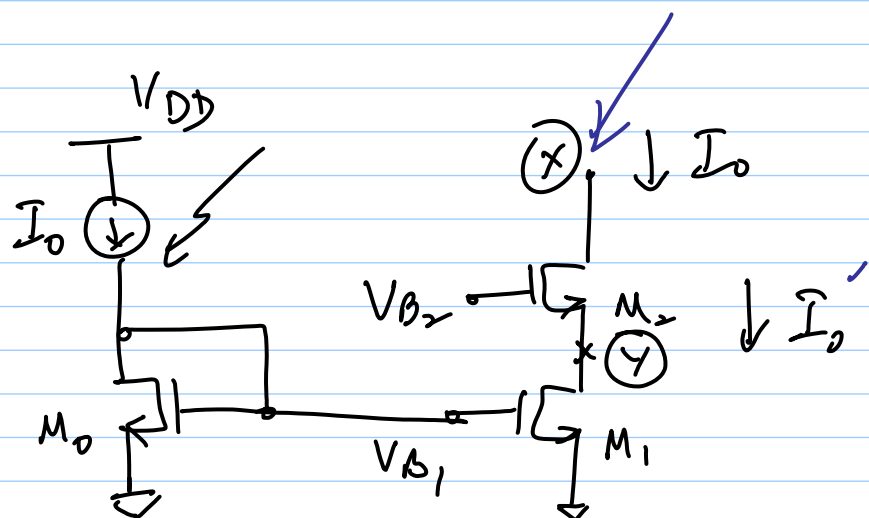
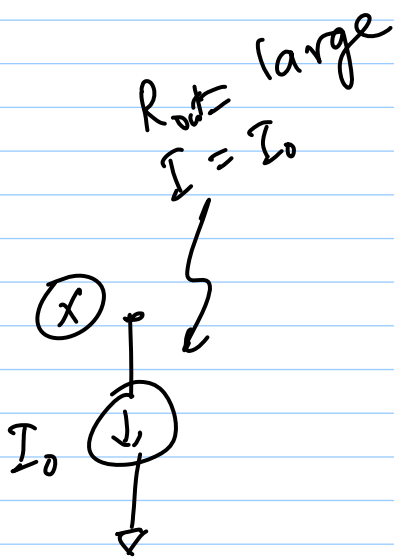
$$\frac{v_o}{(v^+ - v^-)} = g_{m1} (r_{ds1} || r_{ds3})$$

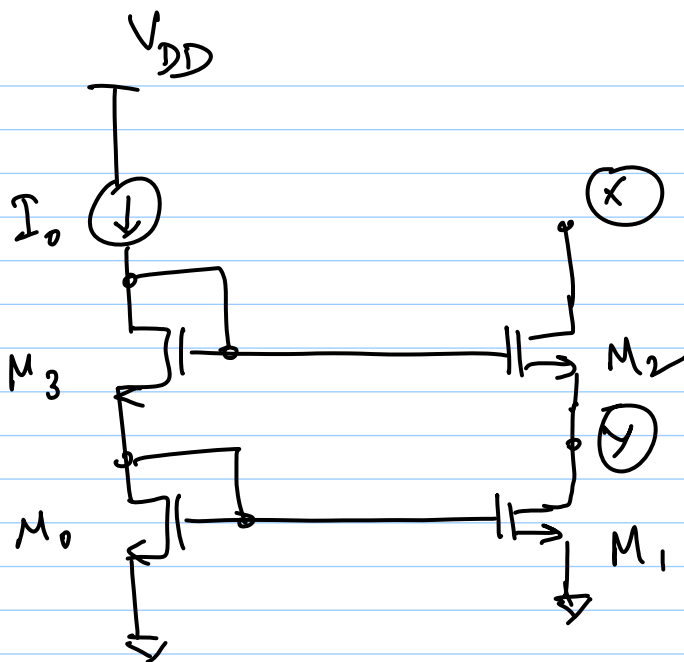
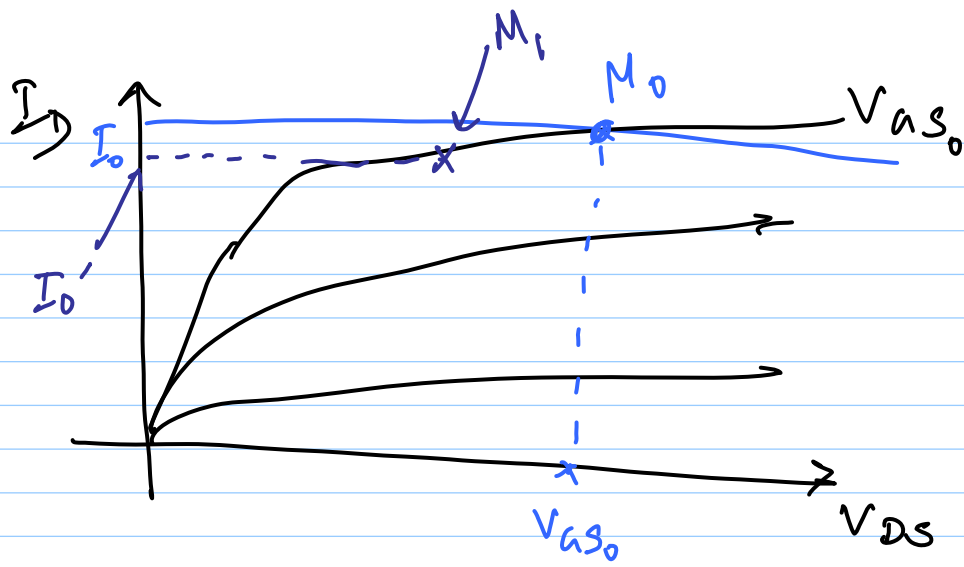
$$\text{NMOS } \begin{cases} g_m = 10 \text{ mS} \Rightarrow 1/g_m = 100 \Omega \\ r_{ds} = 100 \text{ k}\Omega \end{cases}$$

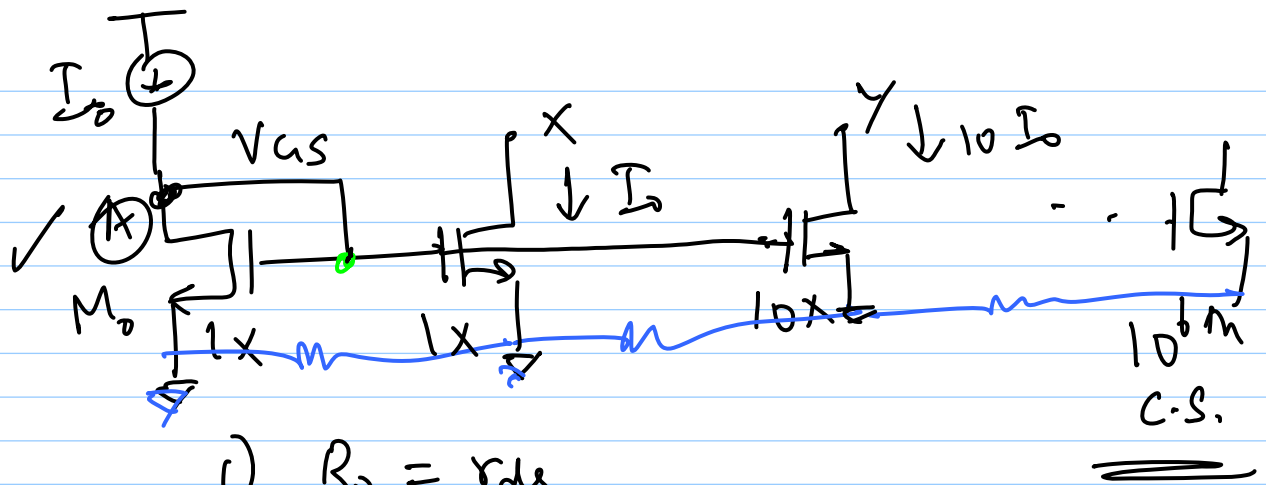
$$\text{C.S. amp} \rightarrow (g_{\text{ain}})_{\text{max}} = 500 \text{ V/V}$$

$$\text{Cascode amp} \rightarrow (g_{\text{ain}})_{\text{max}} = g_m \left[ \frac{g_m r_{ds}^2}{2} \right] = 5e5$$

## Cascode Current Sources







1)  $R_o = r_{ds}$

2)

