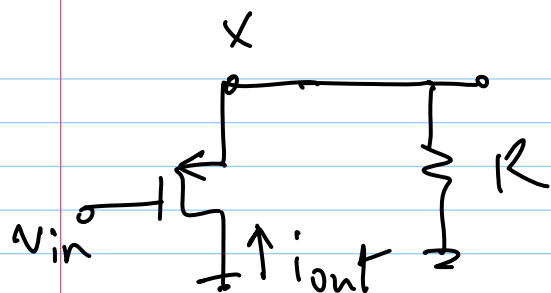
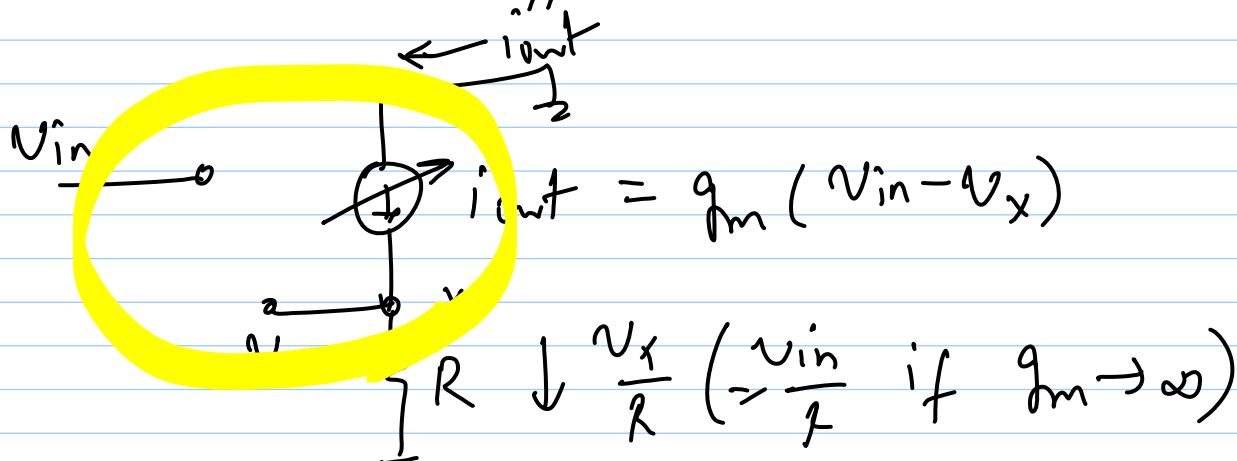


11-10-12

Lec 30

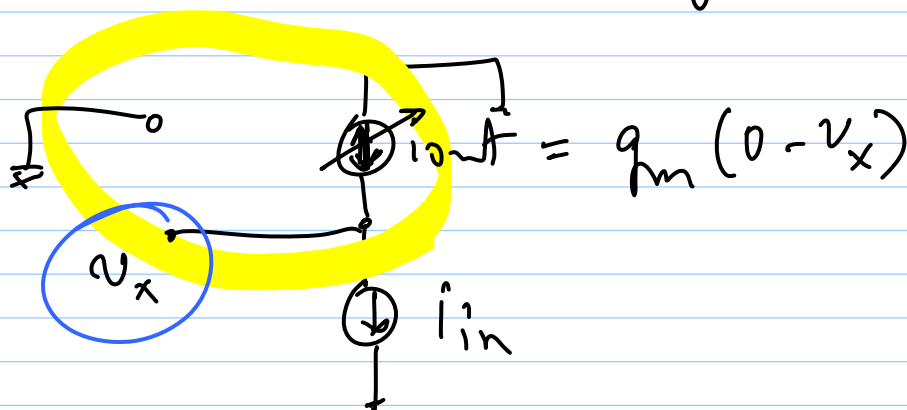
(2) VCCS — Transconductance Amp.

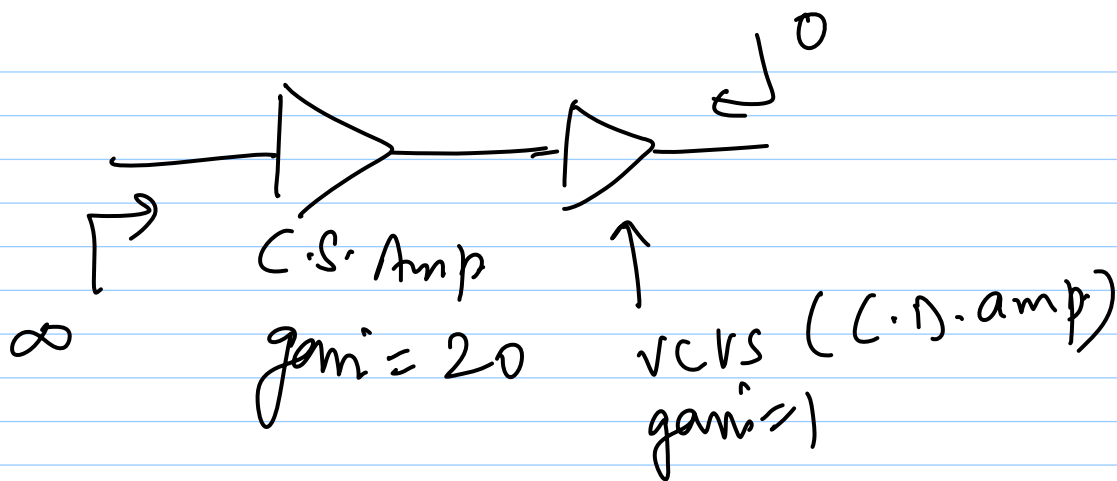
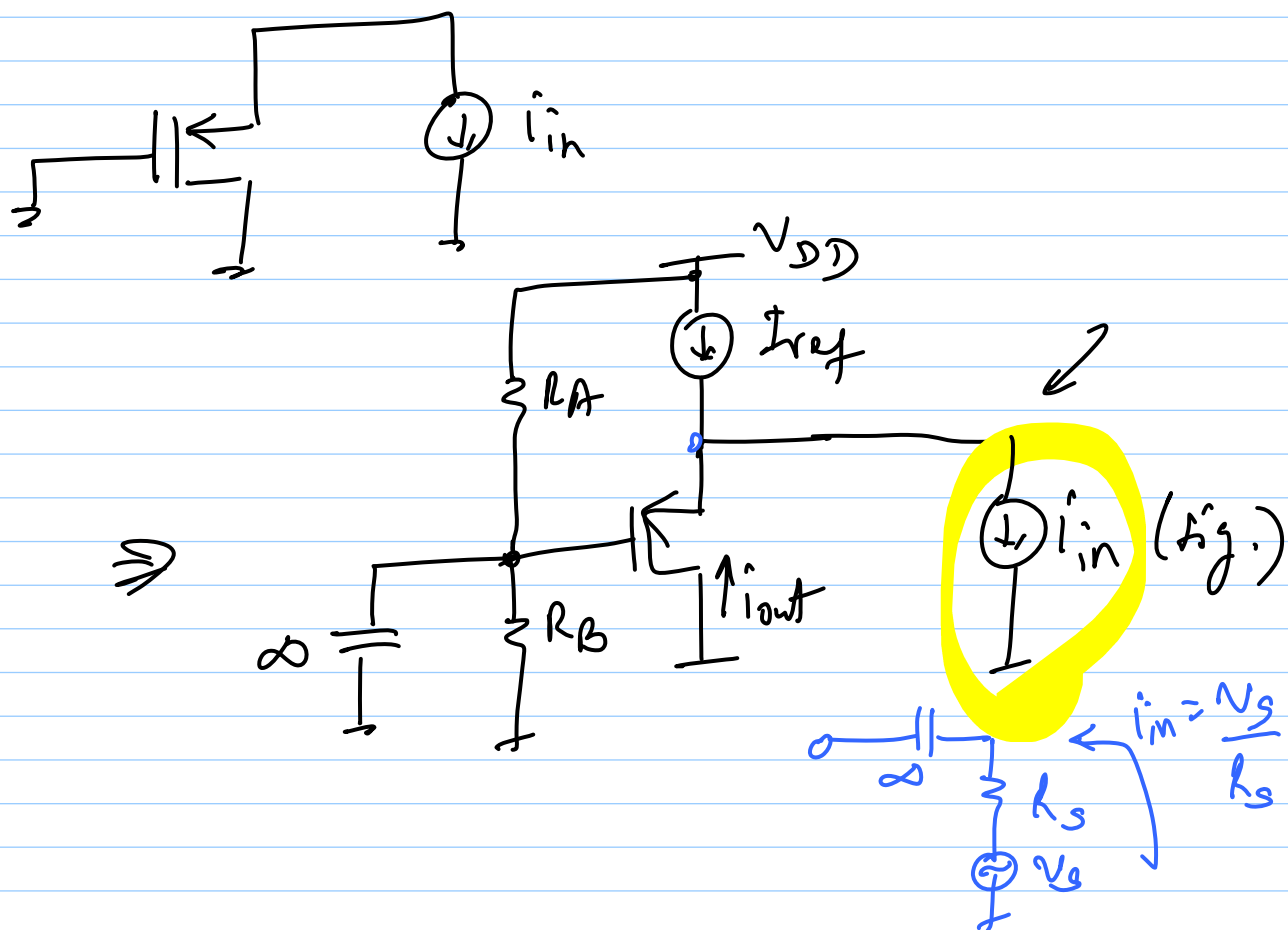
$$i_{out} = v_{in}/R \Rightarrow i_{out} \cdot R = v_{in}$$



$$\text{as } g_m \rightarrow \infty, i_{out} = \frac{v_{in}}{R}$$

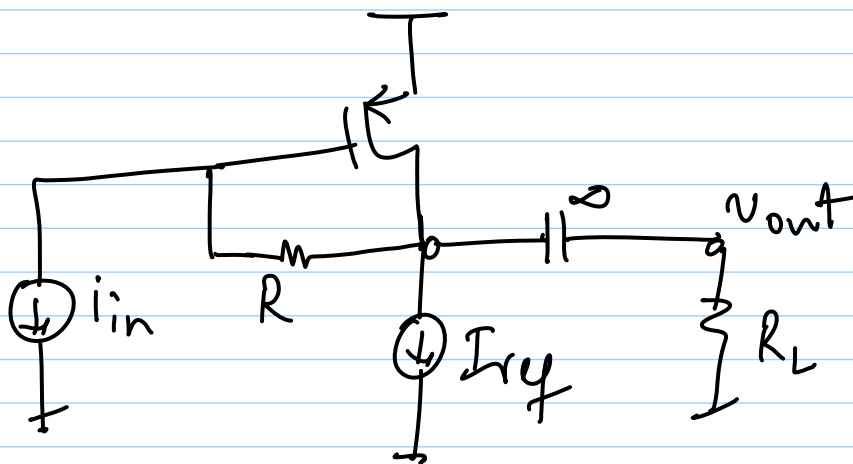
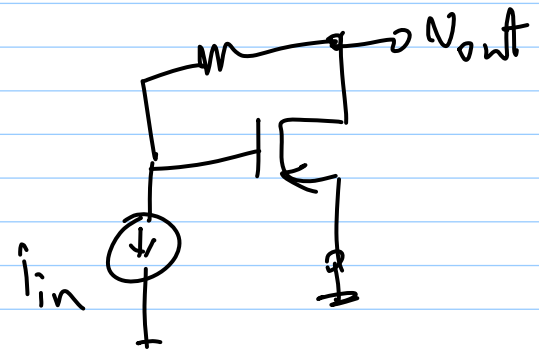
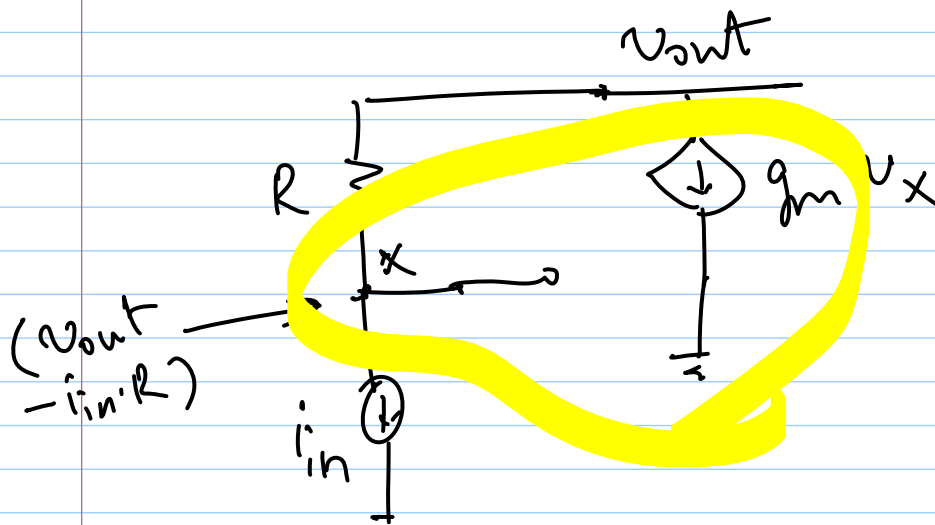
(3) CCCS (Common-gate amp)

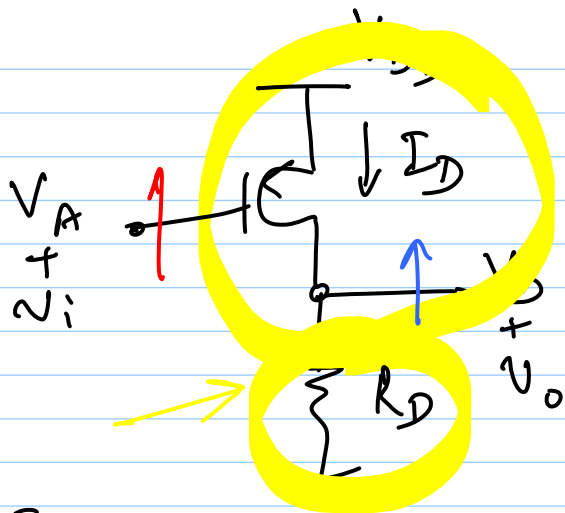




(4) CCVS (Transimpedance Amp.)

$$v_{out} = i_{in} \cdot R$$

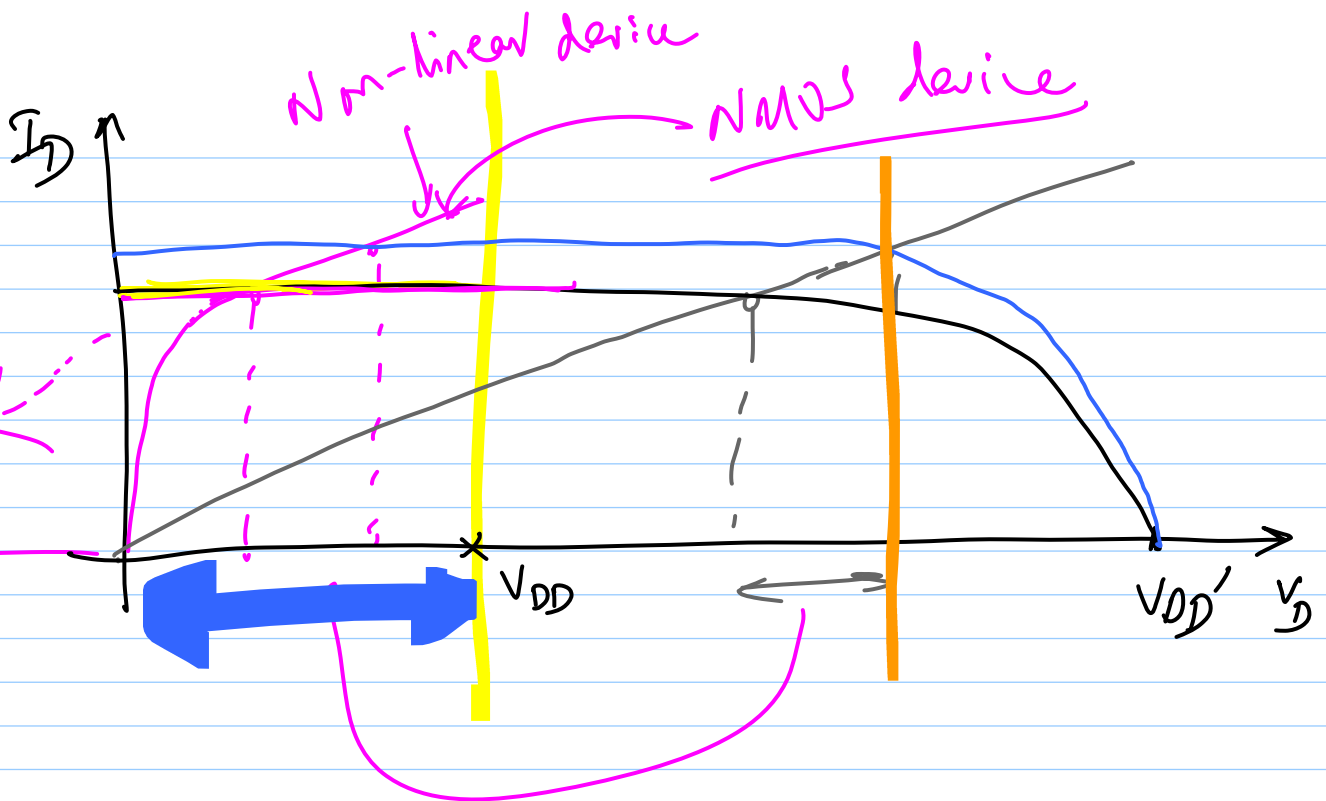
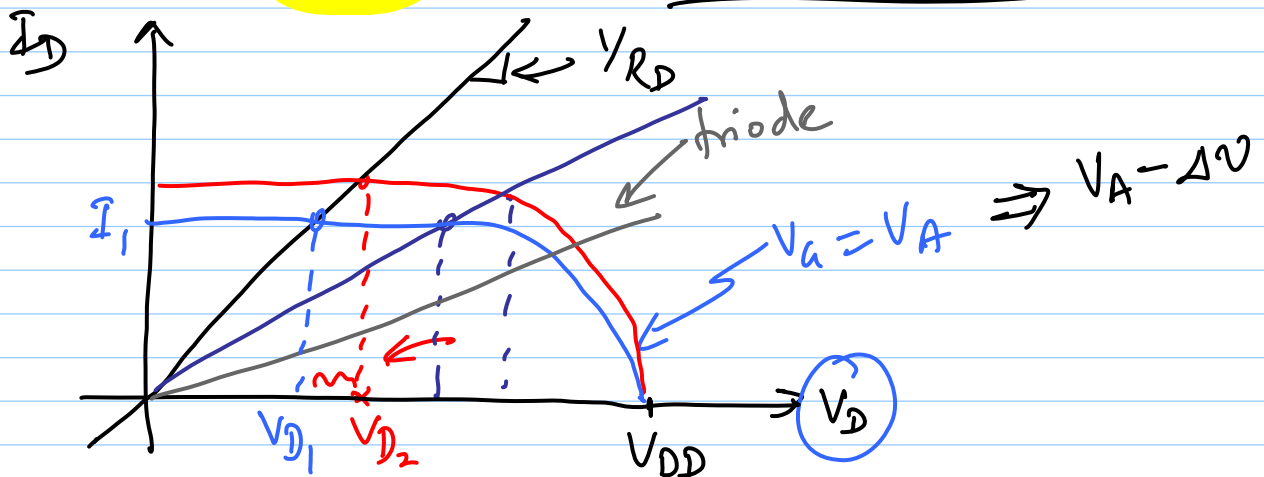


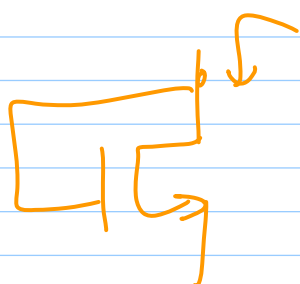
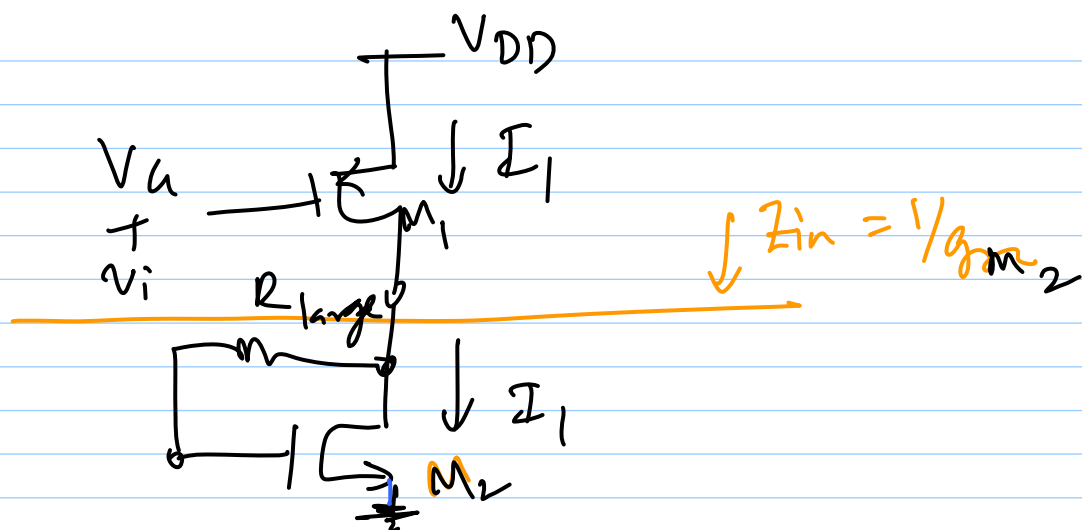
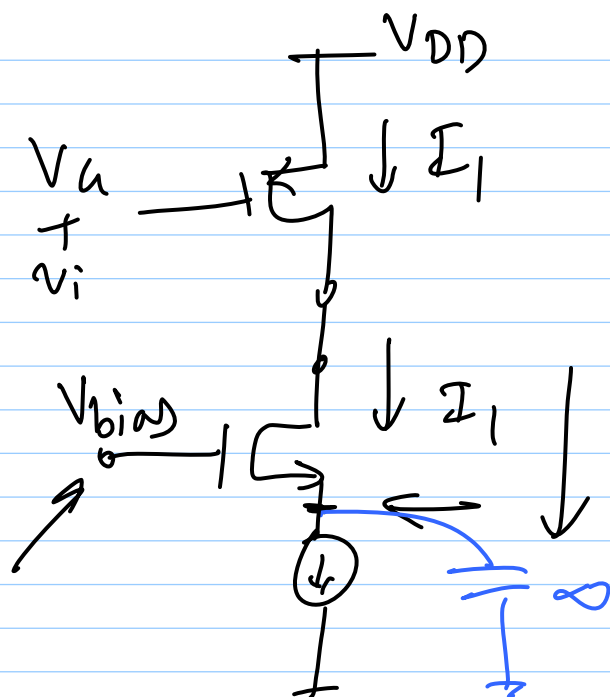


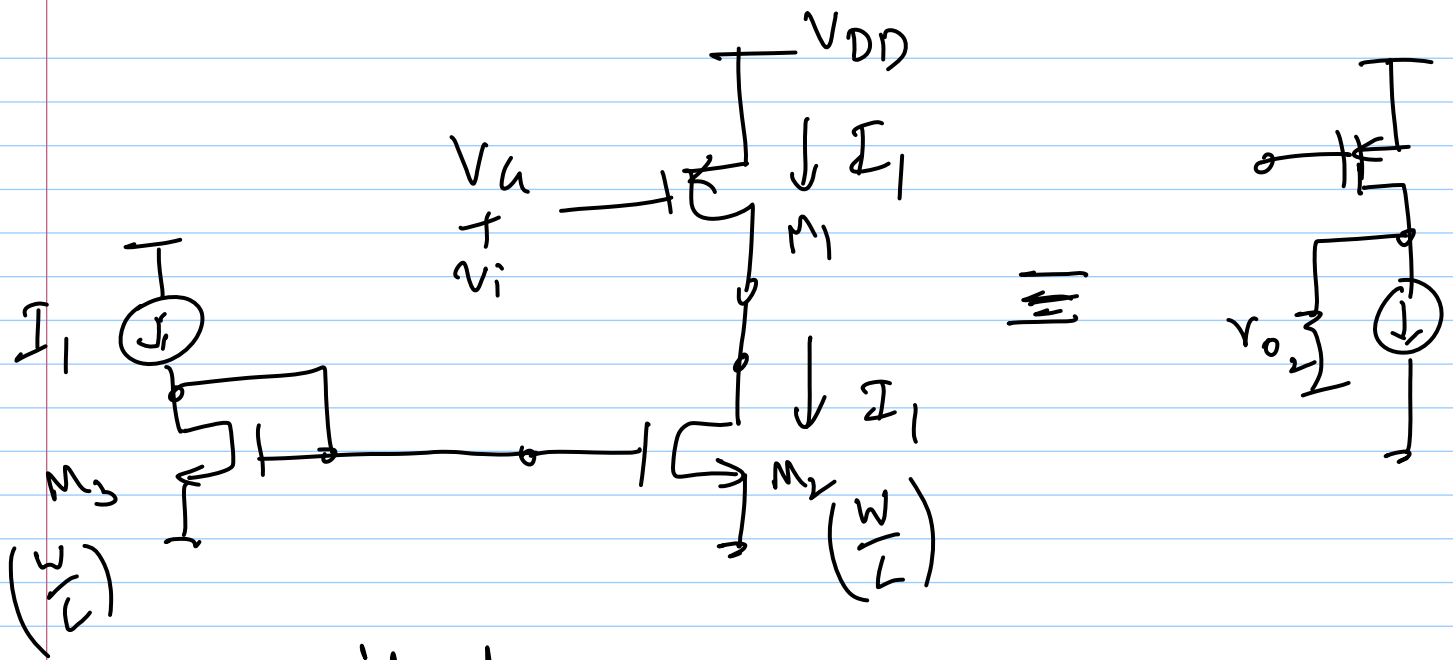
$$\frac{v_o}{v_i} = -g_m R_D$$

$$g_m = f(R_D, V_{DD})$$

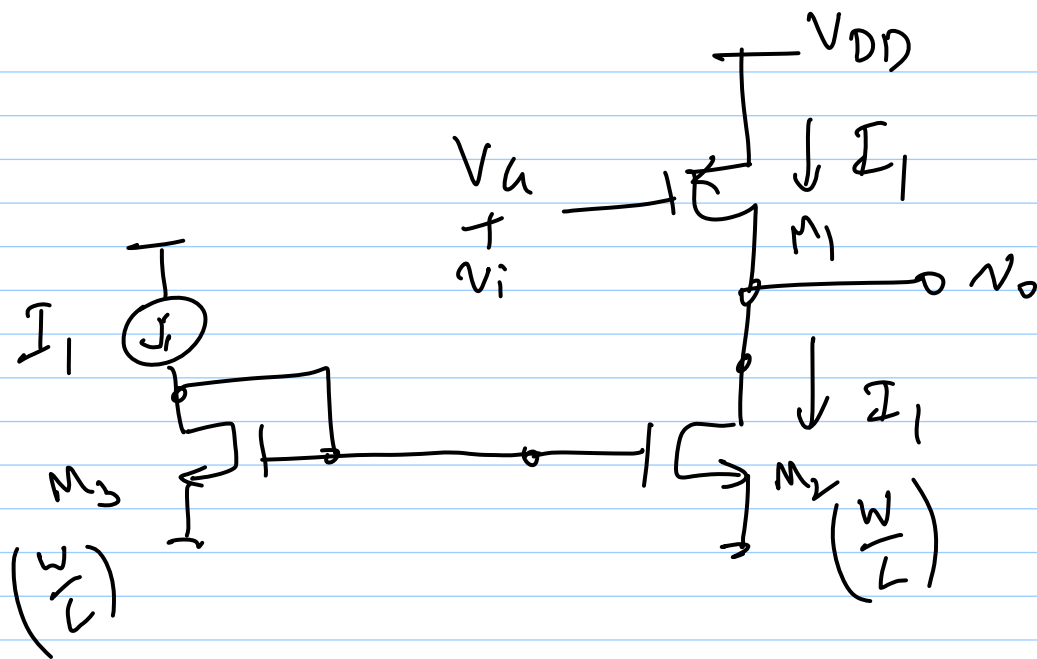
$$V_D = I_D \cdot R_D$$







ideal gain = ∞
 practical gain



$$\left(\frac{v_o}{v_i} \right) = ?$$