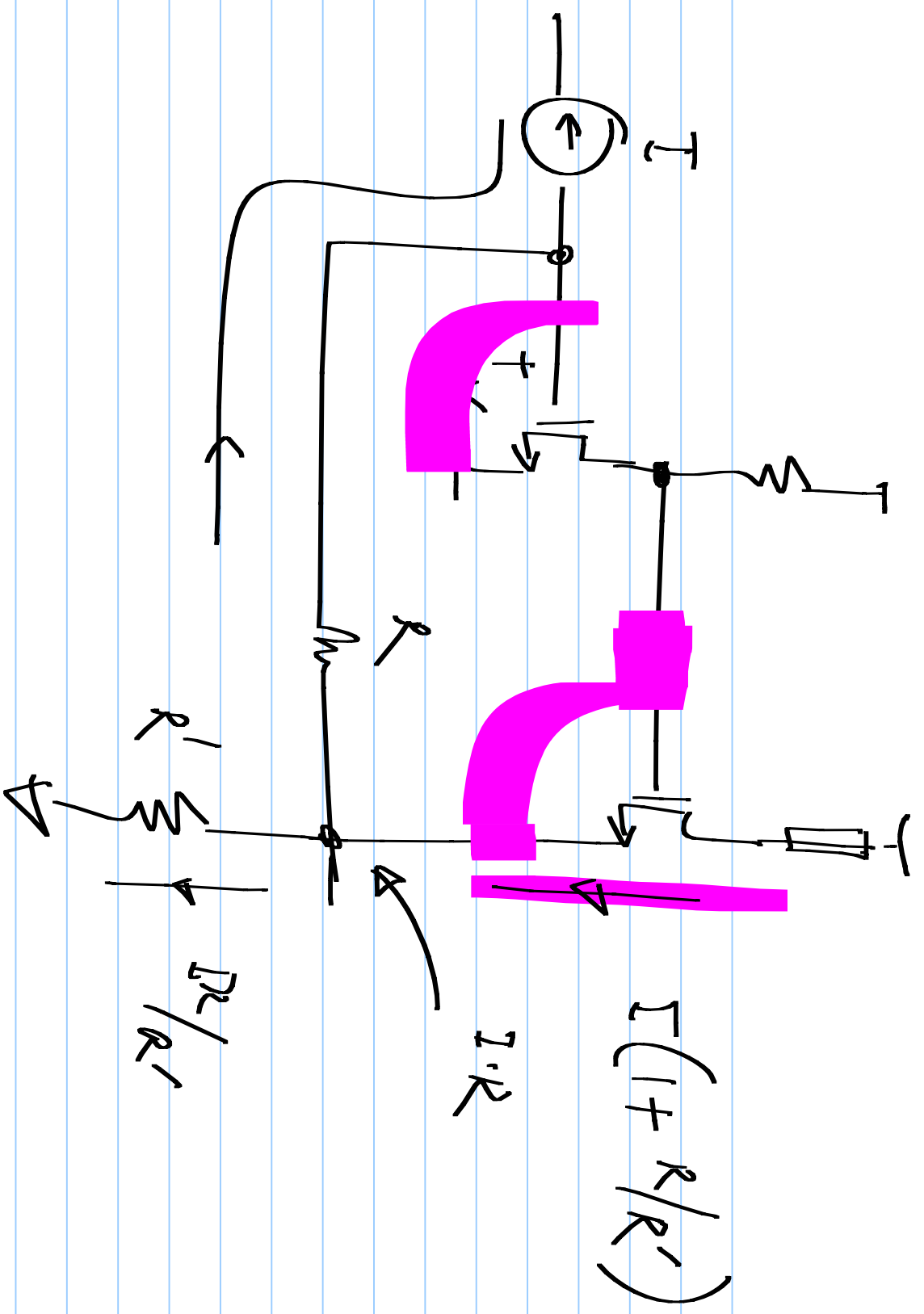
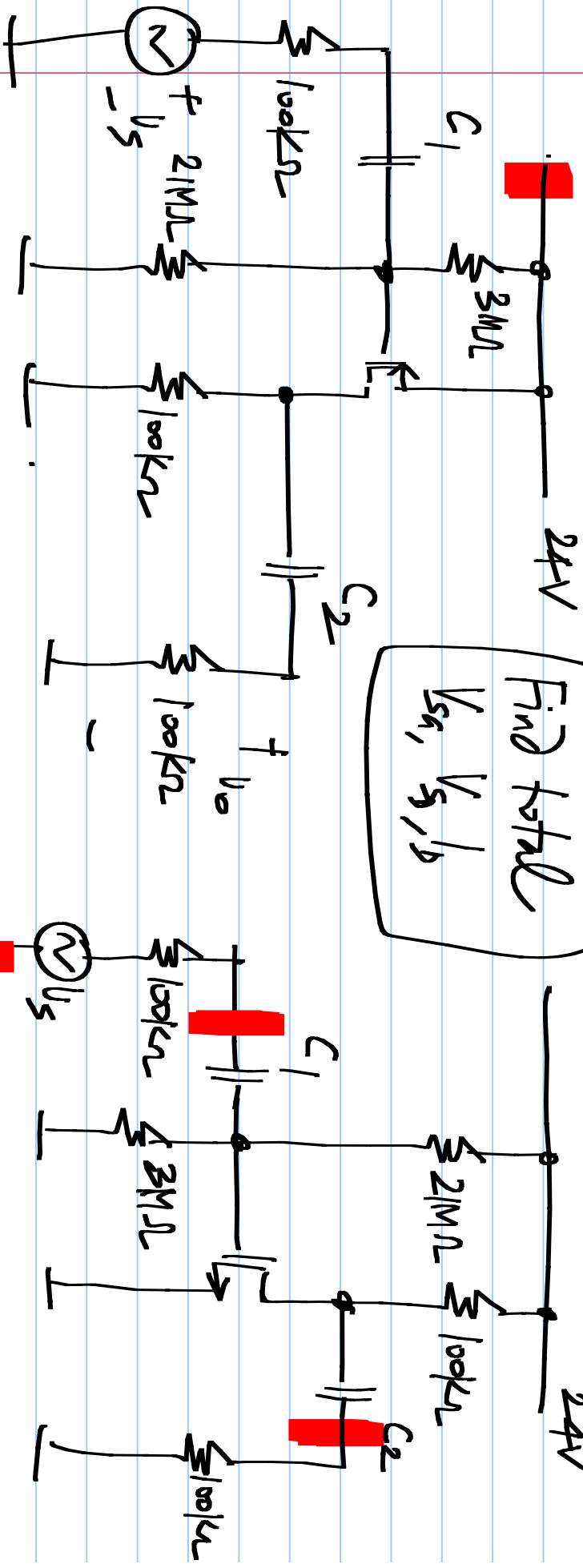
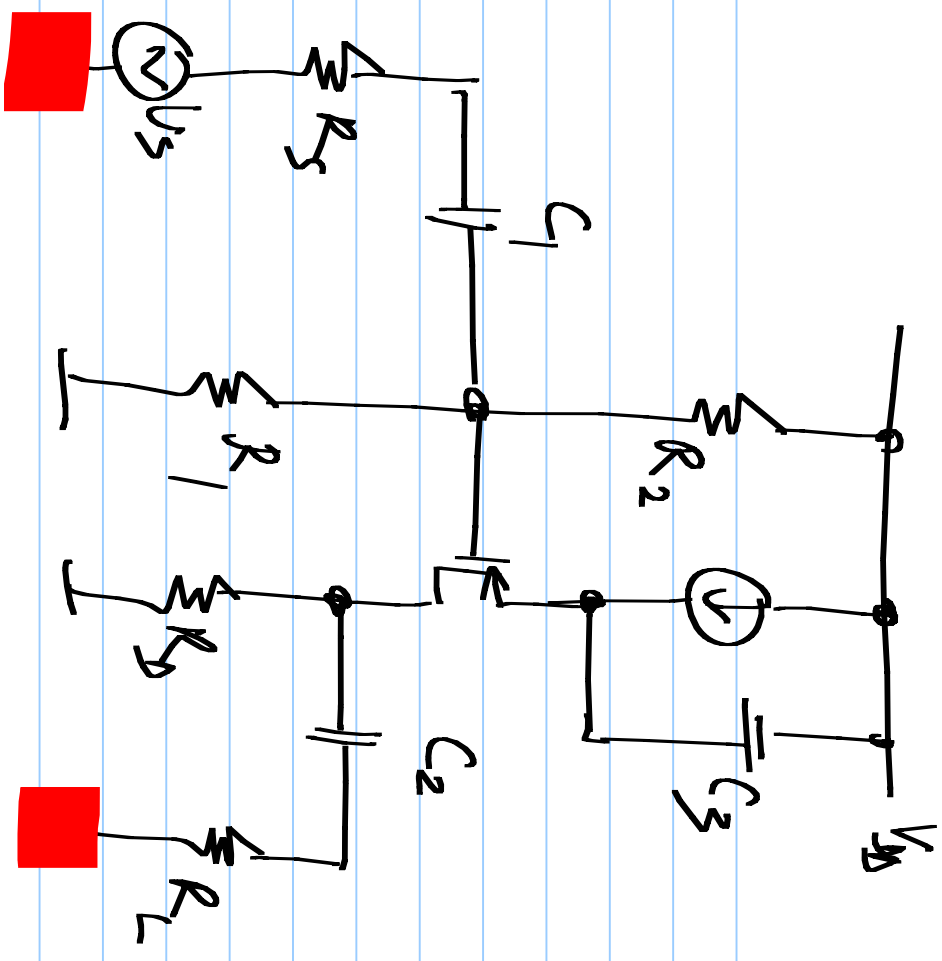
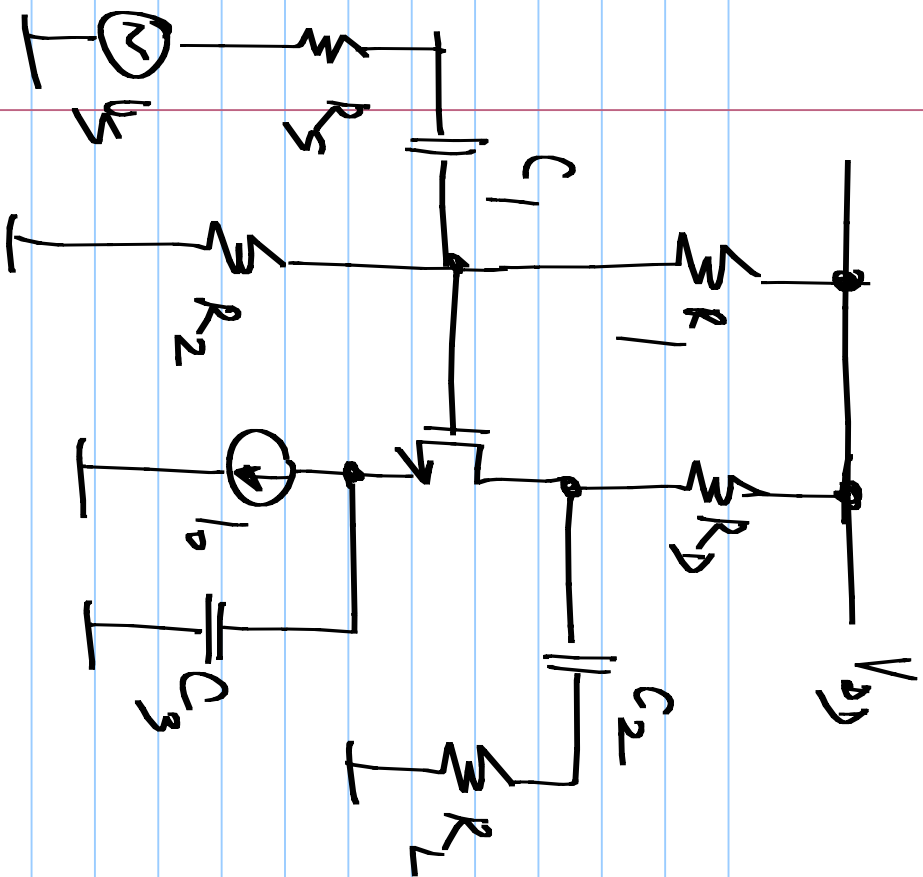


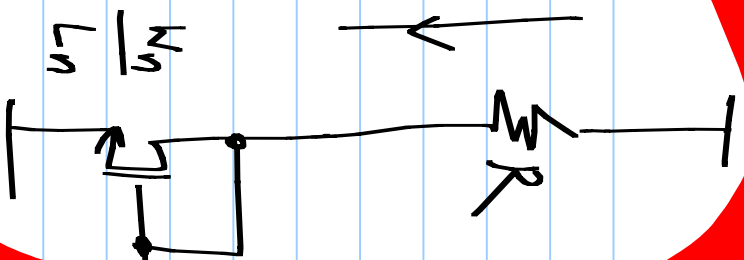


$$M_{pG_x} = 25 \mu A / V^2 \cdot \frac{W_p}{L_p} = 4 \cdot V_{tn} = V_{tp} = 1V \cdot M_{nG_x} = 100 \mu A / V^2 \cdot \frac{W_n}{L_n} = 1$$



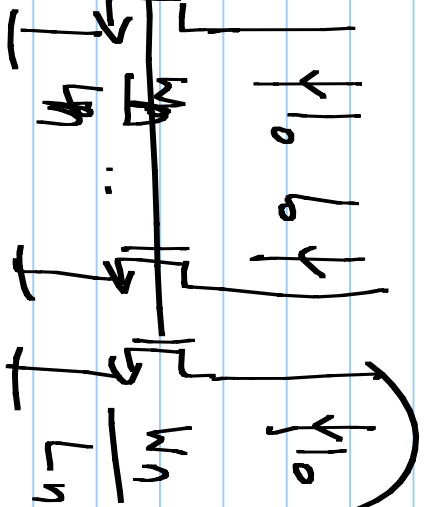
$$\frac{1}{\omega C_1} \ll \frac{100k\Omega + 3M\Omega \parallel 2M\Omega}{V_s} \quad \frac{V_o}{V_s} = -10$$

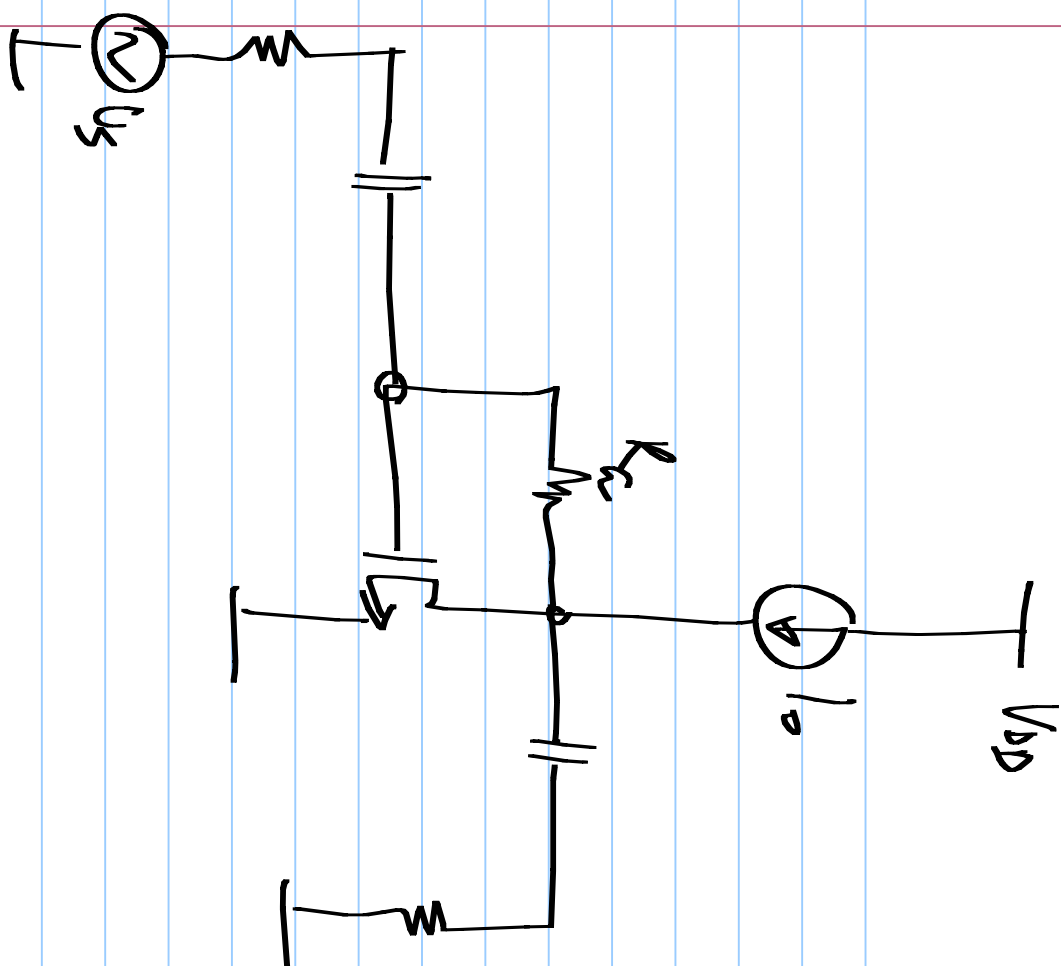




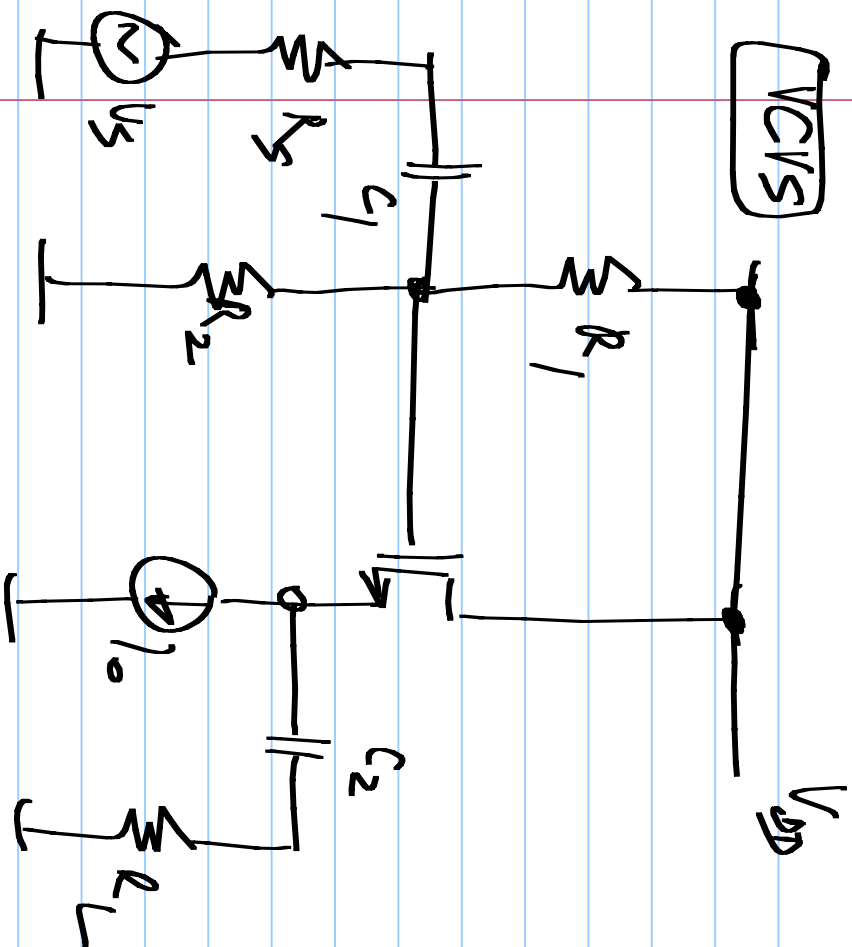
sinks

Source

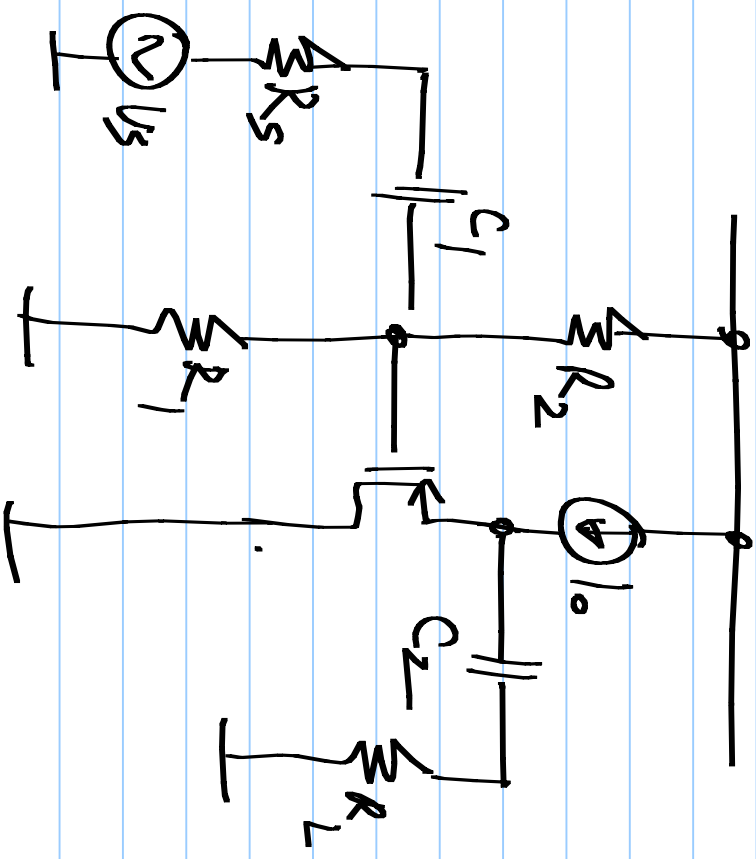




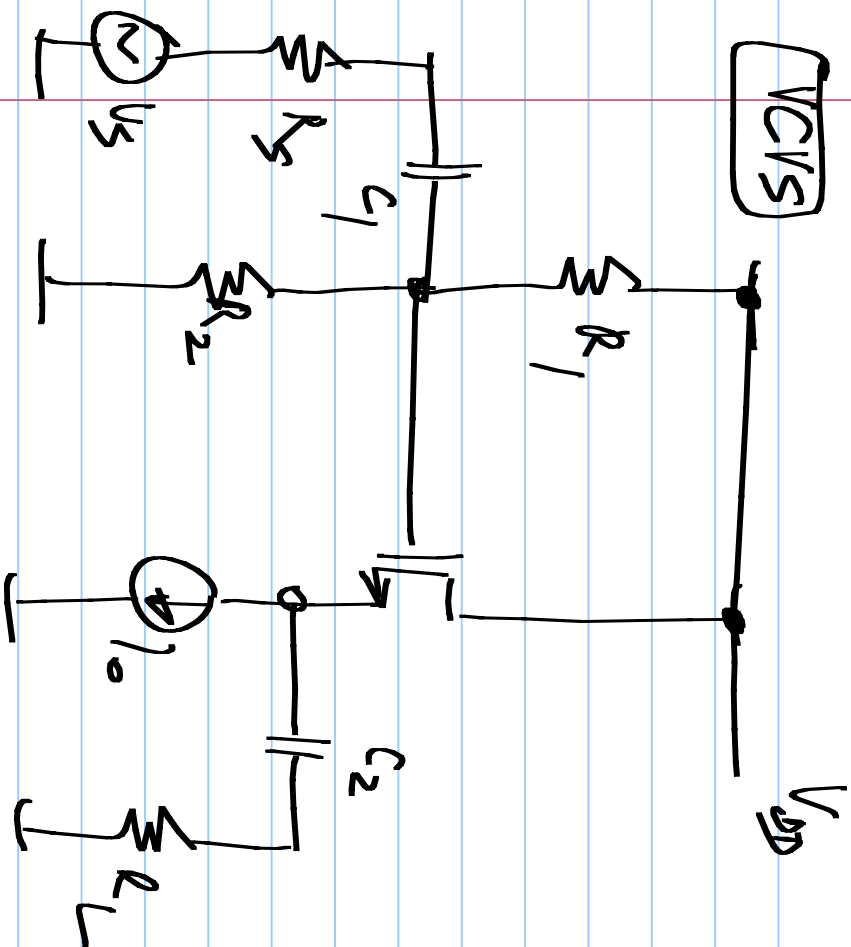
Controlled sources w/ PMOS:



PMOS source follower/
C_D amp.

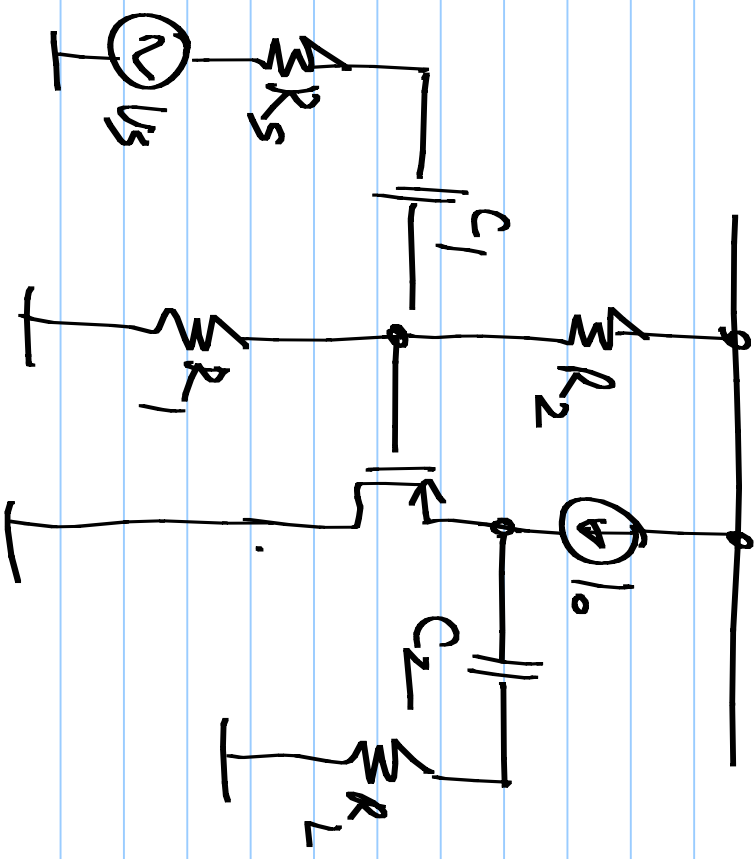


Controlled sources w/ PMOS:



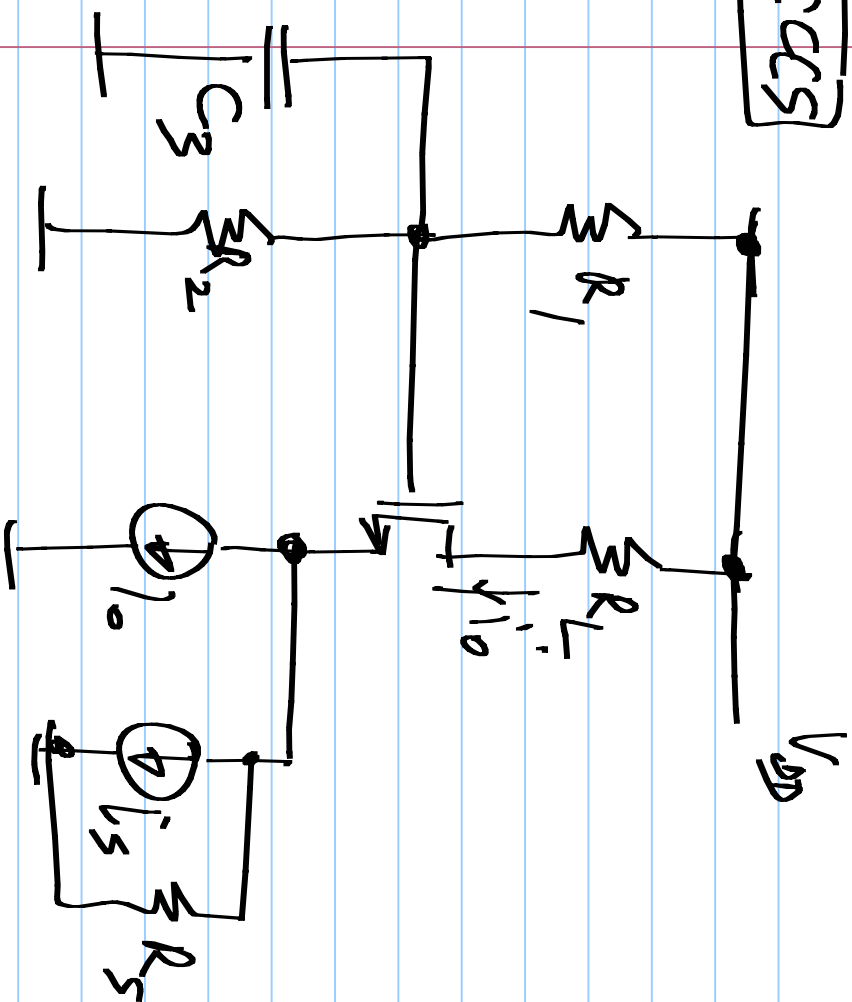
PMOS source follower /

C_D amp.

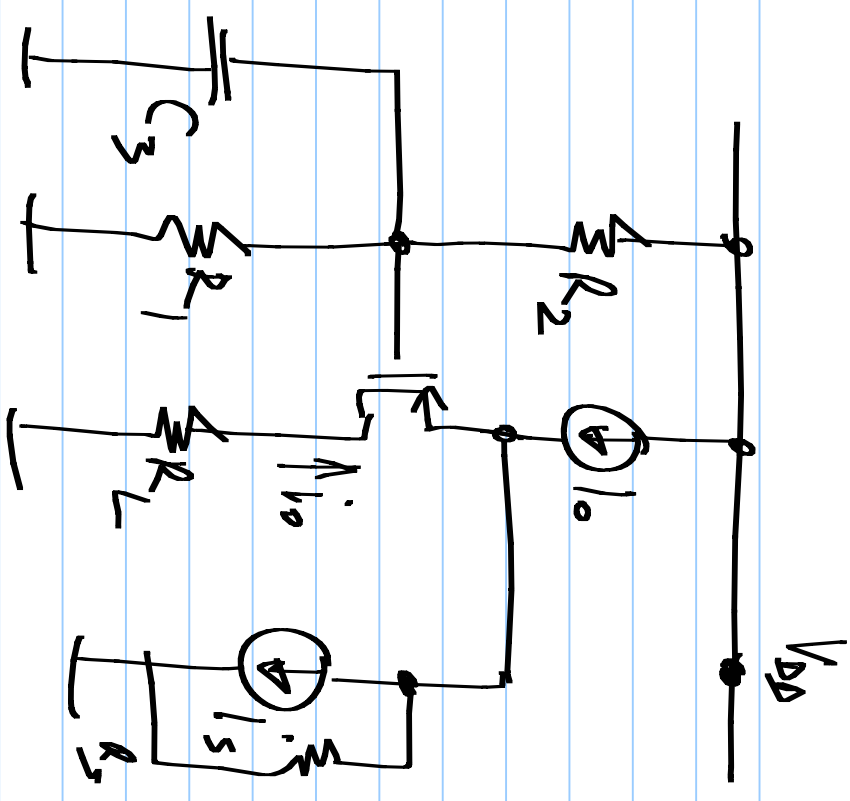


Controlled sources w/ PMOS:

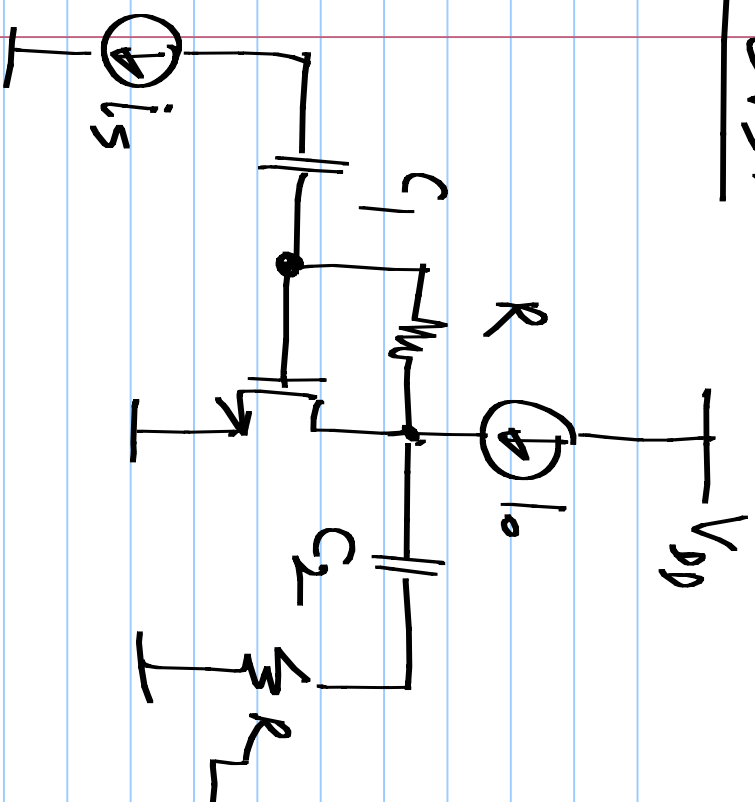
CCCS



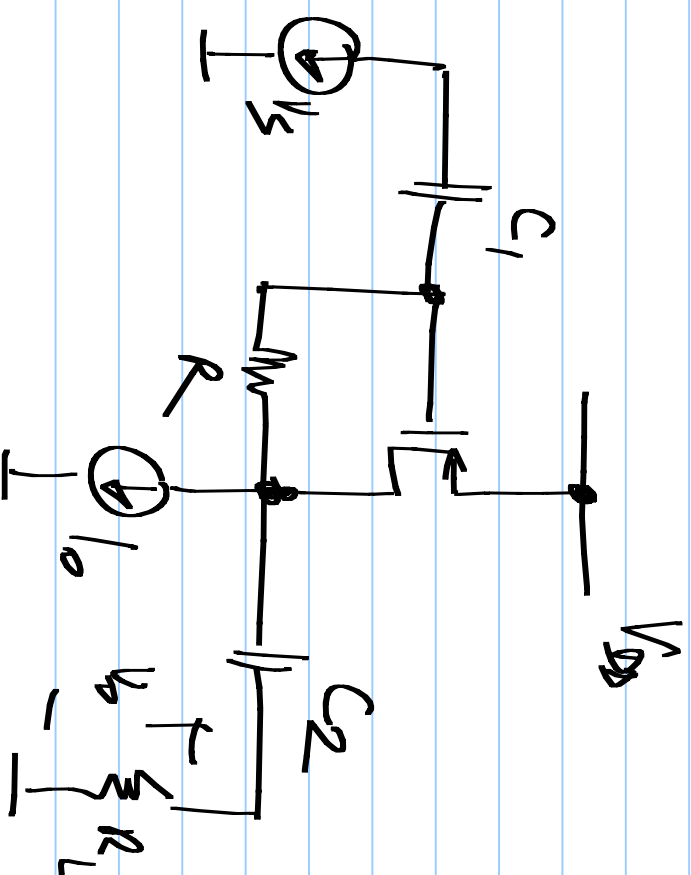
$$i_o \approx i_s$$



CCVS:



$$\frac{V_o}{I_s} \approx R$$



$$-g_m R_L$$

$$= V_{GS} - V_T$$



$$= 100 \Omega \rightarrow 1 M\Omega$$

$$= - \frac{2(V_{DD} - V_{GS})}{2(I_D \cdot R_L)} = - \frac{2(V_{DD} - V_{GS})}{V_{GS} - V_T}$$

$$= - \frac{2 \left[\frac{V_{DD}}{V_{GS} - V_T} - 1 \right]}{V_{GS} - V_T}$$

$$\left\{ - \frac{2 \left[\frac{V_{DD}}{V_{GS} - V_T} - 1 \right]}{V_{GS} - V_T} \right\}$$

$$< 15 mV$$

