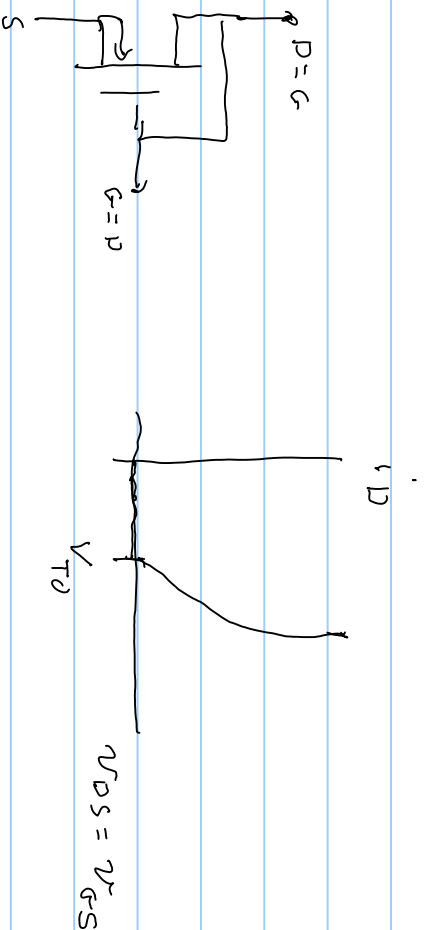
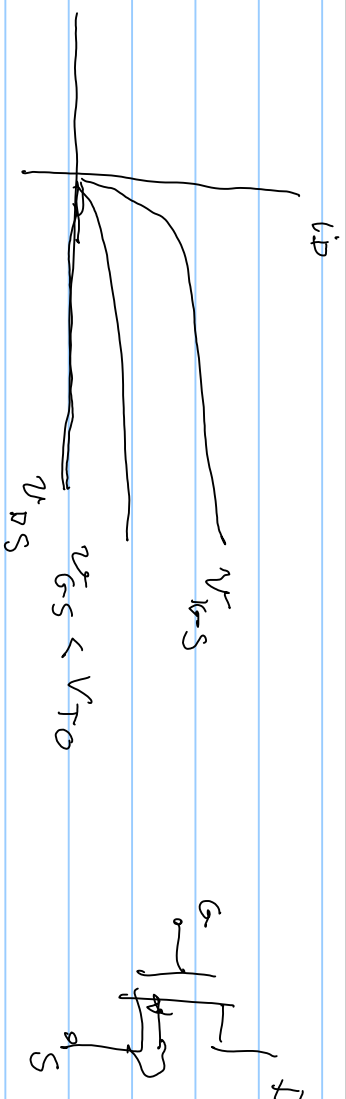


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Note Title

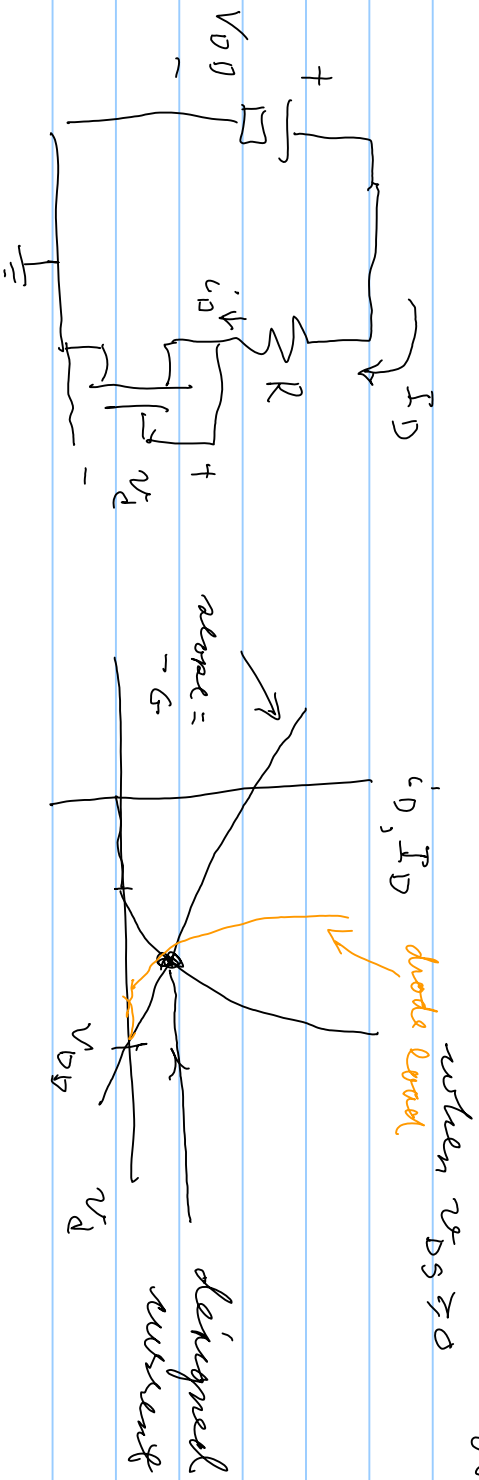
4/10/2017



saturation $v_{GS} - V_{T0} \leq v_{DS} \Rightarrow$ divide connection
 $v_{GS} = v_{DS}$

for $V_{T0} > 0$ (enhancement mode transistor) then

(diode) $v_{GS} \sim V_{T0} = V_{DS} - V_{T0} < v_{DS} \Rightarrow$ diode is in saturation (on off)

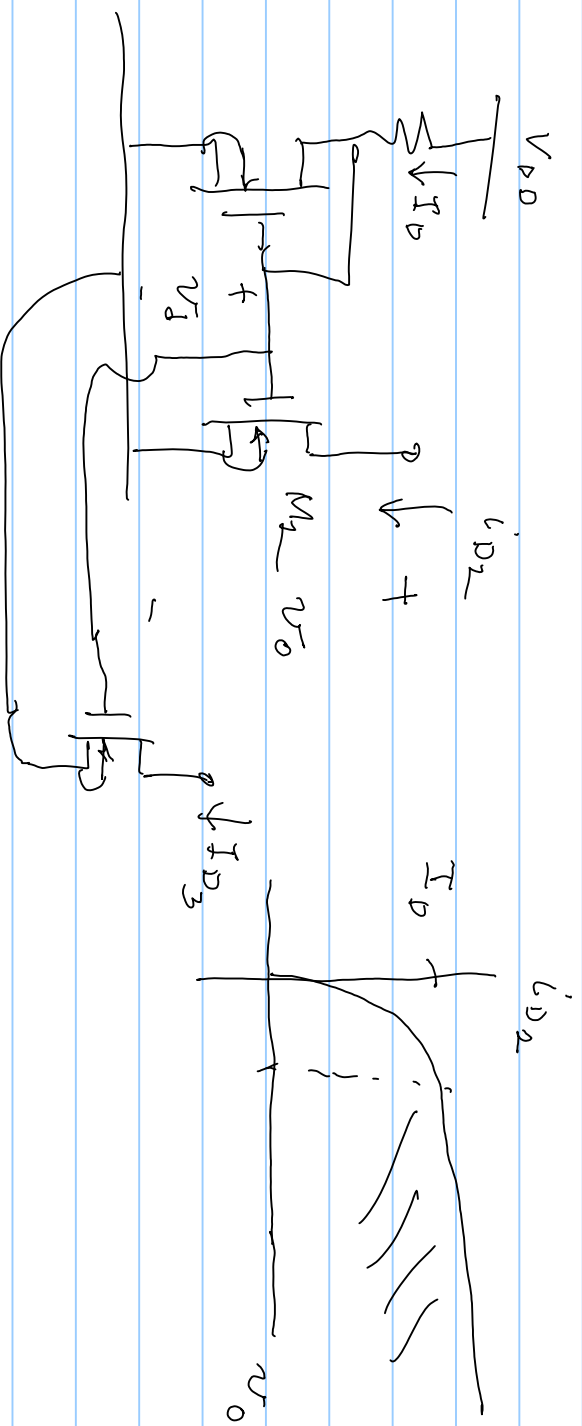


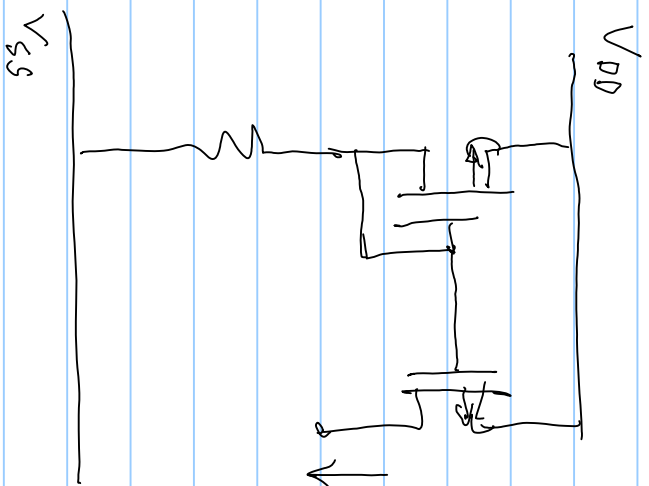
$$V_{DD} = R I_D + v_D \Rightarrow I_D = \frac{(v_D - V_{DD})}{R} = -G(v_D - V_{DD})$$

$$= -G v_D + G V_{DD} = G(V_{DD} - v_D)$$

for saturation $i_D = \frac{K_P}{2} \cdot \frac{W}{L} (v_{GS} - V_{T0})^2 \Rightarrow i_D = \frac{K_P}{2} \cdot \frac{W}{L} (v_D - V_{T0})^2$
 when $v_D > V_{T0}$

$$I_D = G(v_{DD} - v_D) = \frac{K_P}{2} \cdot \frac{W}{L} (v_D - V_{T0})^2$$





current (source) mirror

