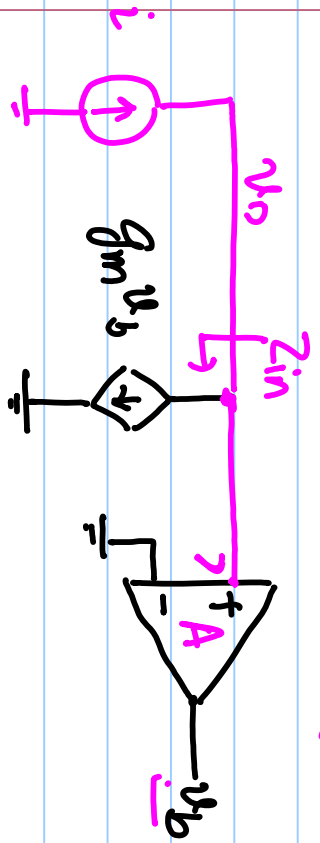
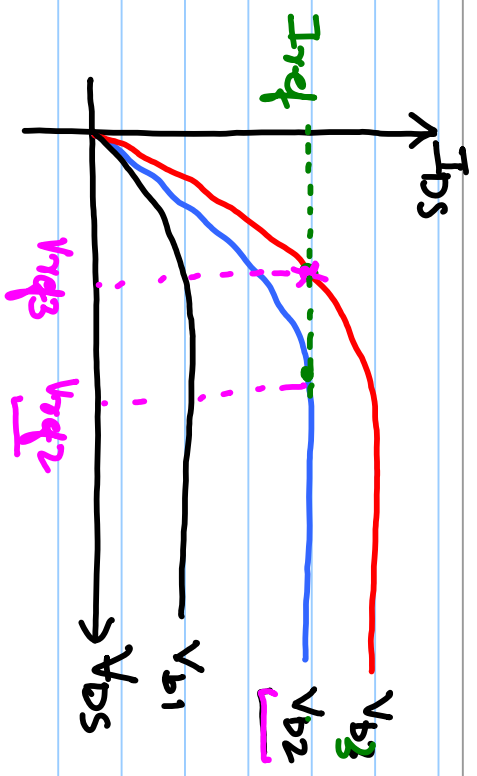


$i$ :  $x$ :  $+ve$ ,  $y$ :  $-ve$   $v$

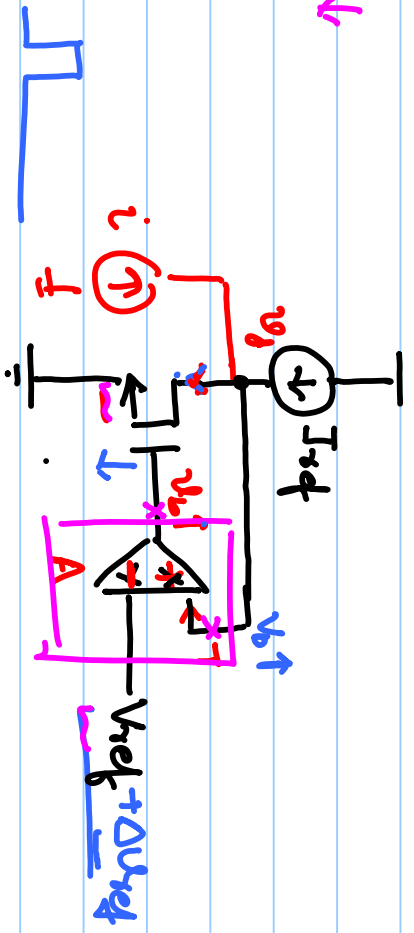
$V_x - V_y = \downarrow \Rightarrow V_b \downarrow$



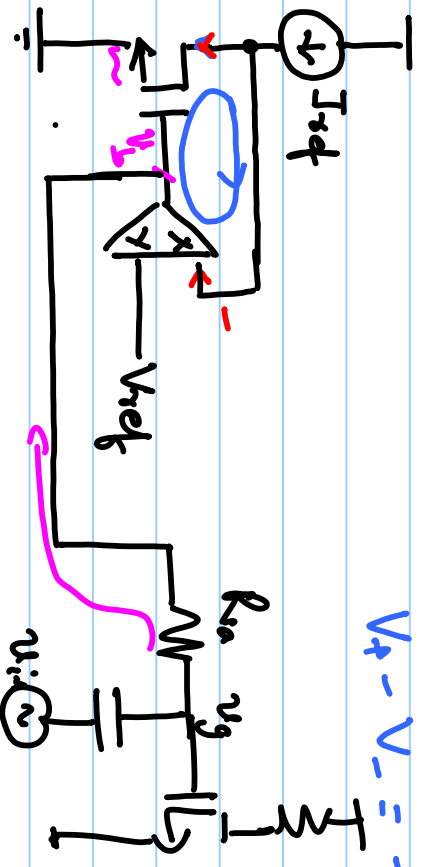
$v_i = gm v_b = gm \cdot A v_o$

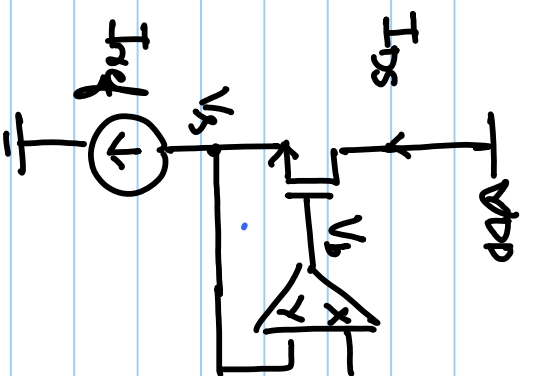
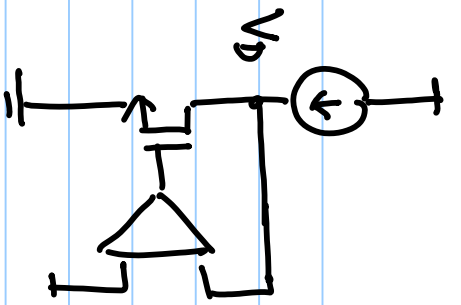
$v_o = A v_o$

$\frac{v_o}{i} = \frac{1}{gm A} = Z_{in}$



$V_x - V_y = -\Delta V_{ds}$





$$-V_B \downarrow \Rightarrow V_B - V_S \uparrow$$

$$V_S \downarrow \Rightarrow V_{DQ} - V_S \uparrow \downarrow$$

$$V_D \propto A(V_{DQ} - V_S)$$

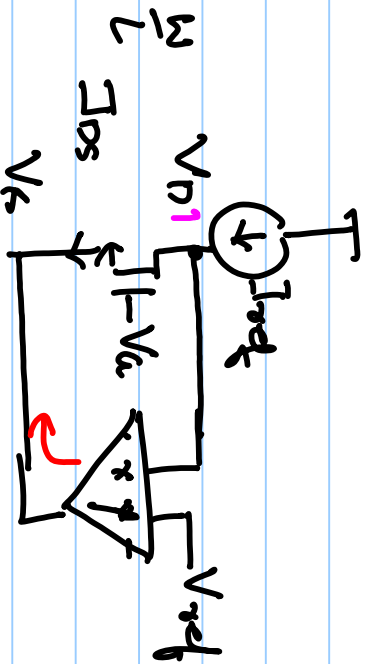
X: +ve, Y: -ve

if  $I_{DQ} > I_{D0S} \Rightarrow V_S \downarrow \Rightarrow V_{DQ} - V_S \uparrow$

$$V_X - V_Y = V_{DQ} - V_S \uparrow \Rightarrow V_D \uparrow \Rightarrow I_{D0S} \uparrow$$

if X: +ve, Y: -ve X X: -ve, Y: +ve

if  $I_{DQ} > I_{D0S} \Rightarrow V_D \uparrow \Rightarrow V_X - V_Y = V_D - V_{DQ} \uparrow \downarrow$



$$I_{D0S} \downarrow \uparrow \leftarrow V_S = A(V_X - V_Y) \uparrow \downarrow$$

