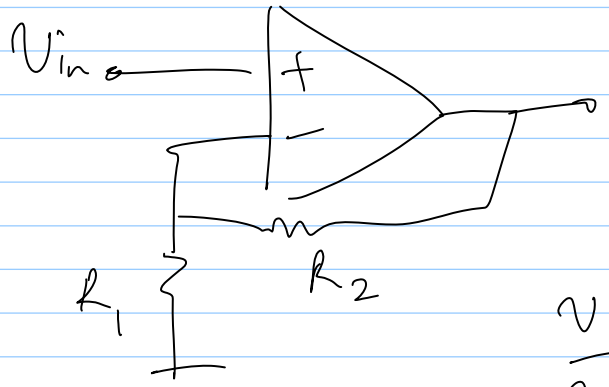
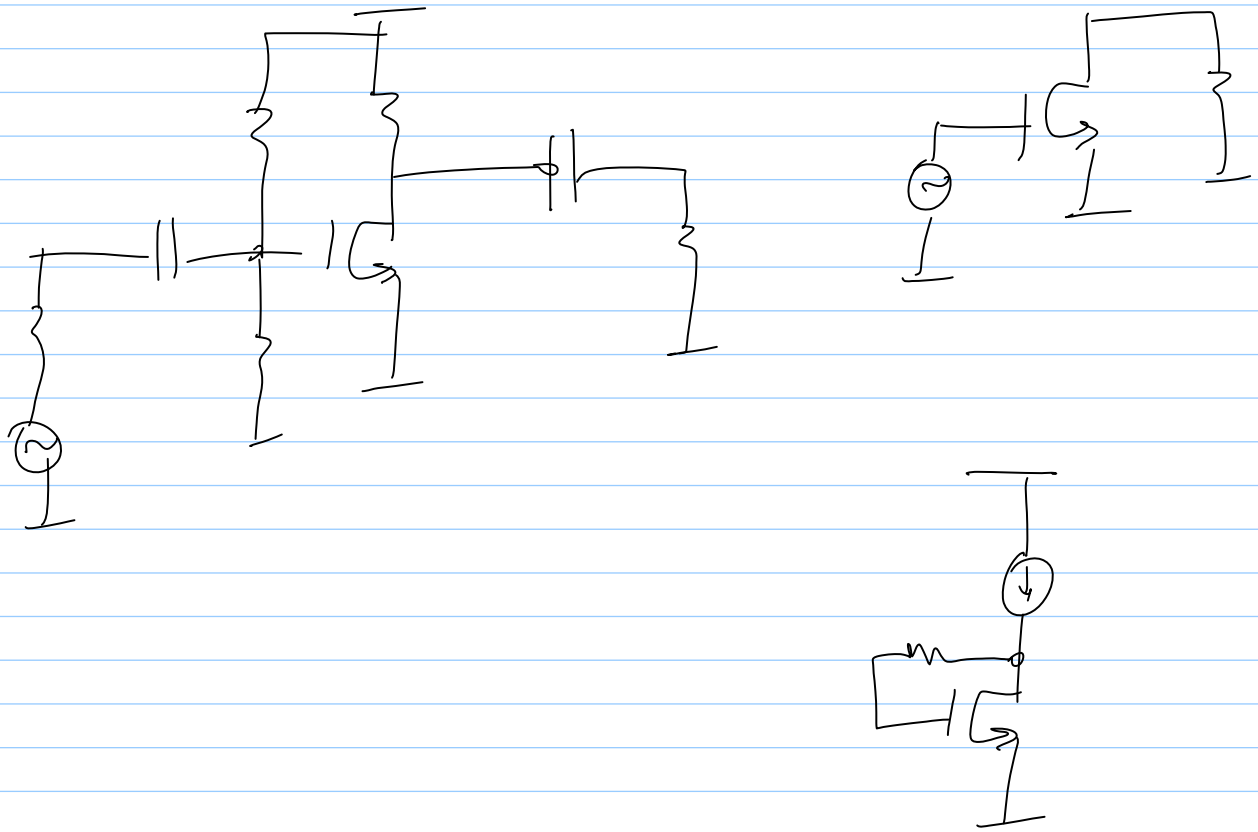
20-9-12

Lec 22



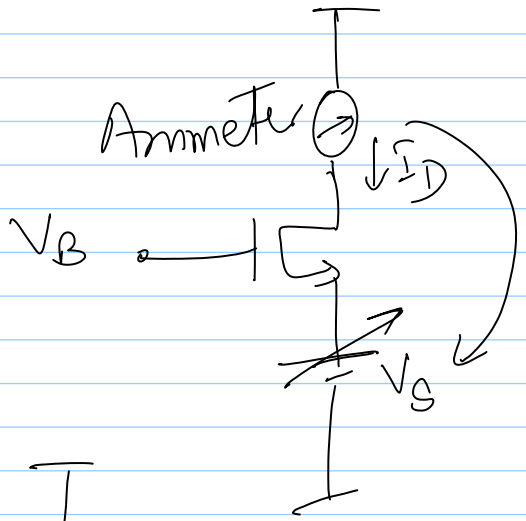
$$\frac{V_o}{V_{in}} = 1 + \frac{R_2}{R_1}$$

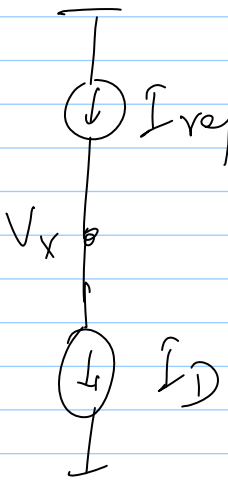


Case 1 : measure I_D
f.b. V_G

Case 2 : measure I_S
f.b. V_S

Case 3 : measure I_D
f.b. V_S





* measure I_D

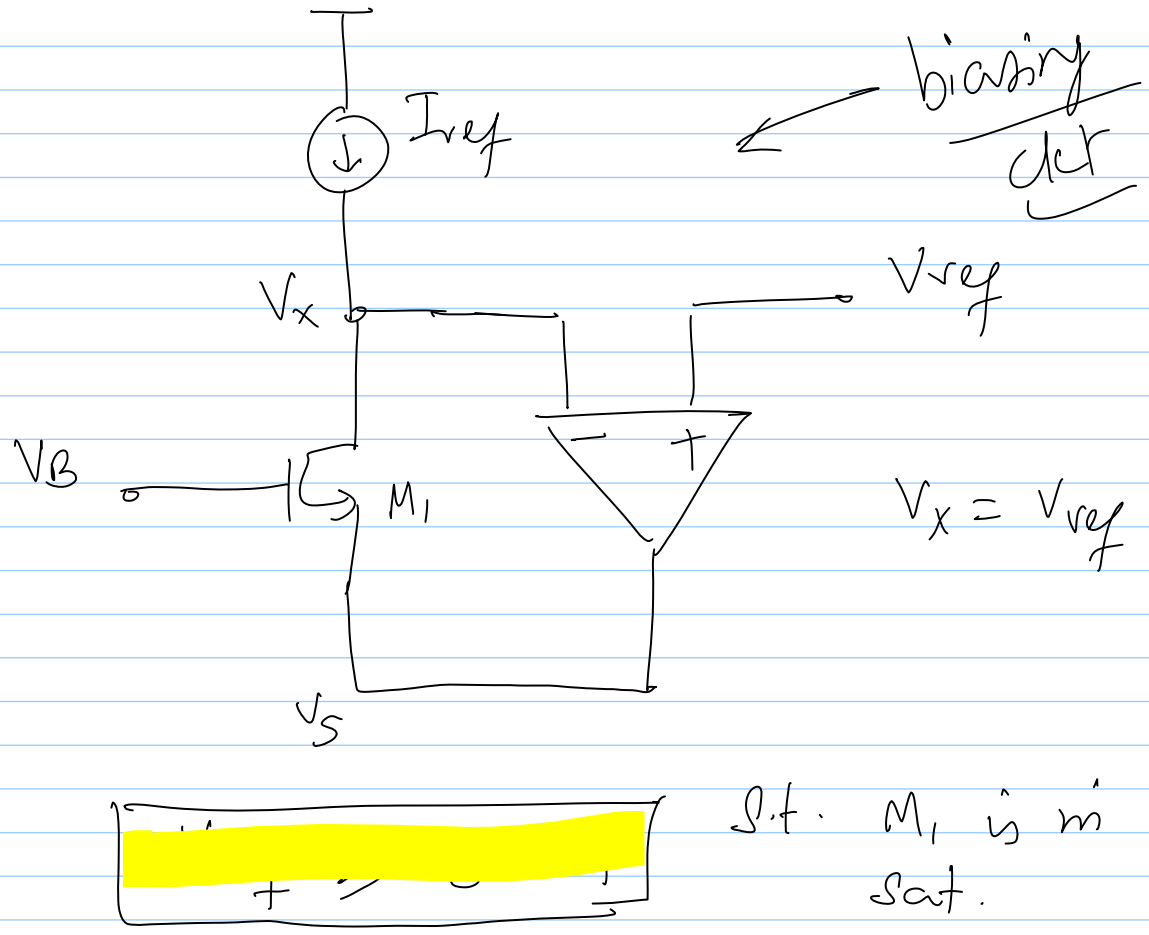
* $I_D < I_{ref} \Rightarrow \uparrow V_{GS}$
$\Rightarrow \downarrow V_S$

$I_D > I_{ref} \Rightarrow \downarrow V_{GS}$
$\Rightarrow \uparrow V_S$

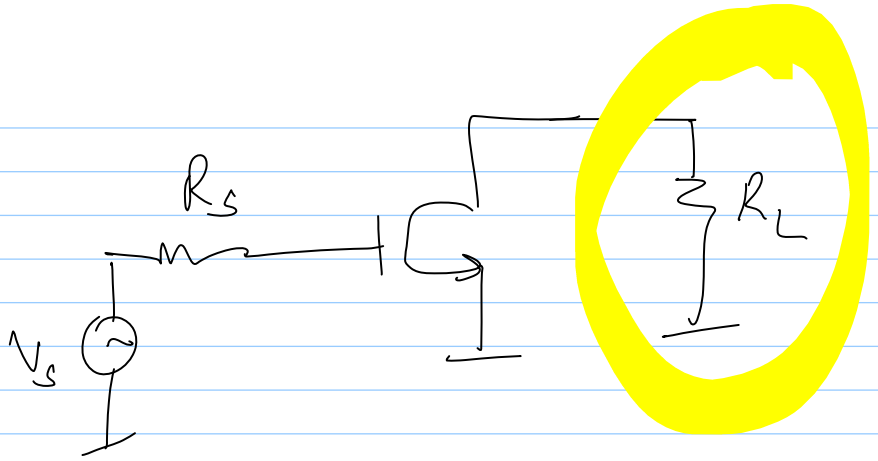
$I_D < I_{ref} \Rightarrow V_X \uparrow$

$I_D > I_{ref} \Rightarrow V_X \downarrow$

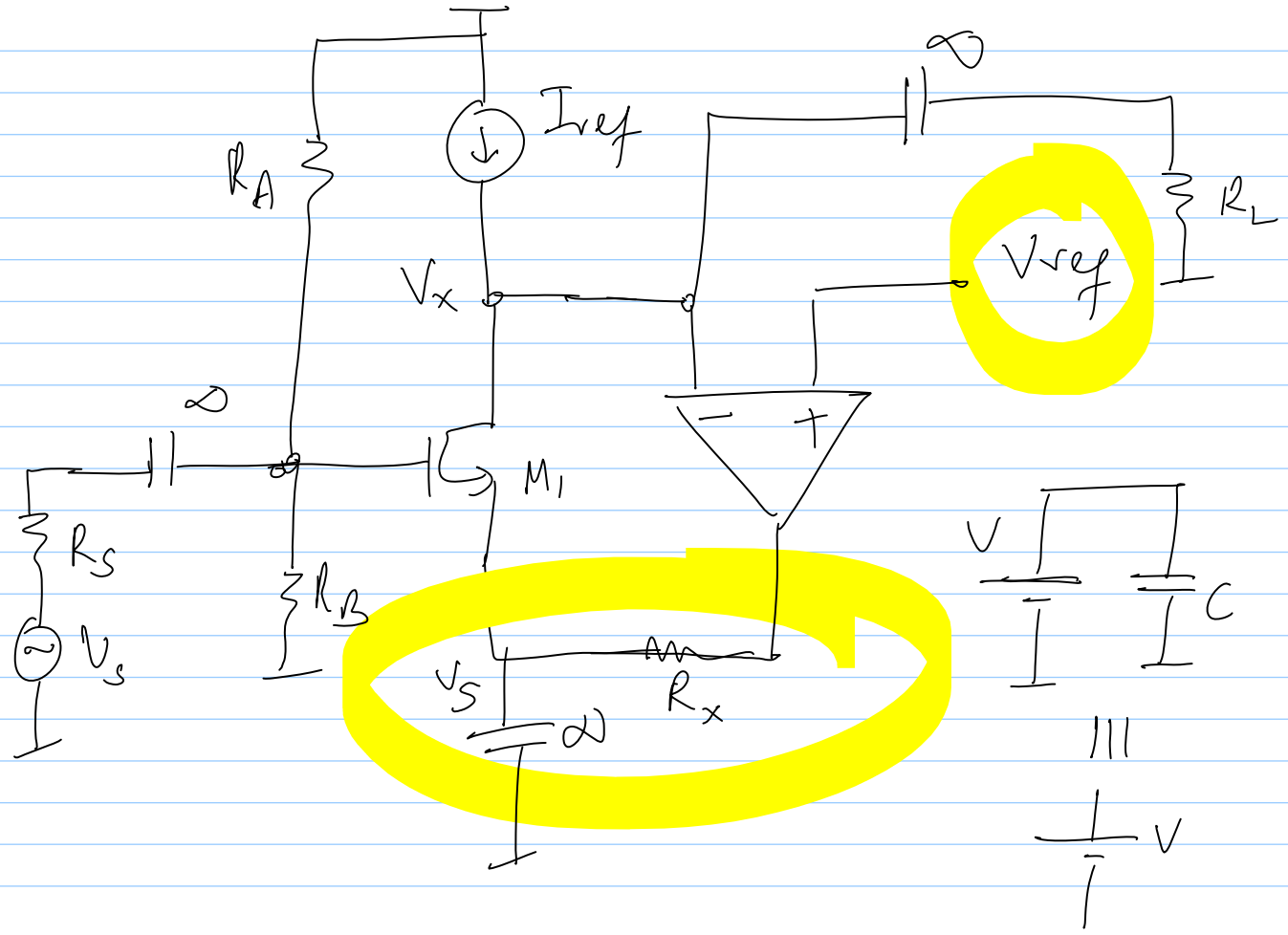
$I_D = I_{ref} \Rightarrow V_X$ constant



S.t. M_1 is in sat.



inc. eq. ckt.


I_{ref}
R_A
V_x
R_L
V_{reg}
M_1
R_S
V_s
R_B
V_S
R_x
V
C
V