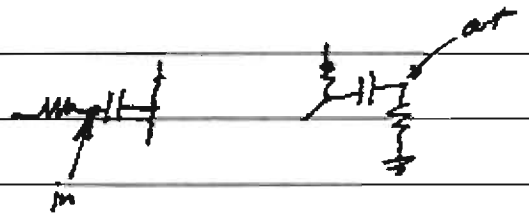
log ln } math
10^x e^x

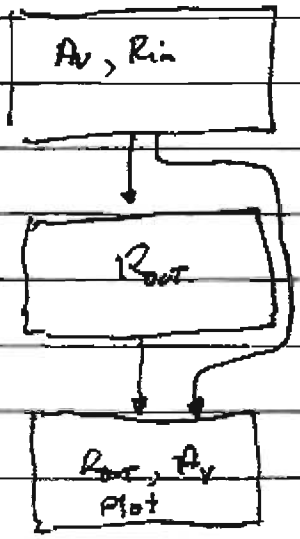
log → ln
$\log_{10}$ → log } pspice

dB(V(RL:2)/V(acir))

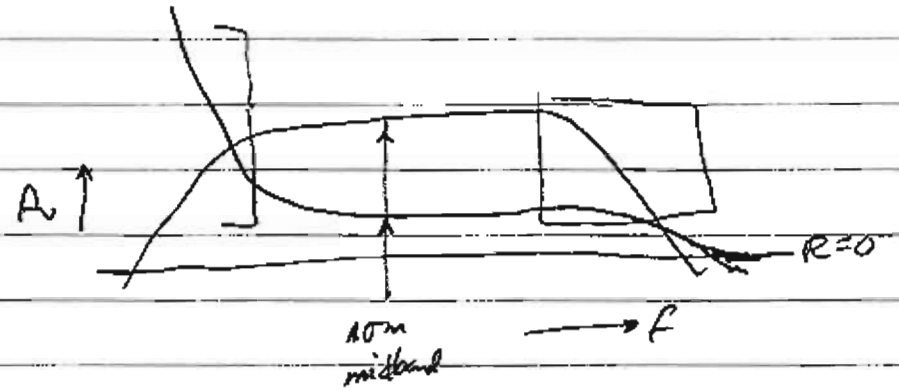


$R_{in} = V_{in}/I_{in}$

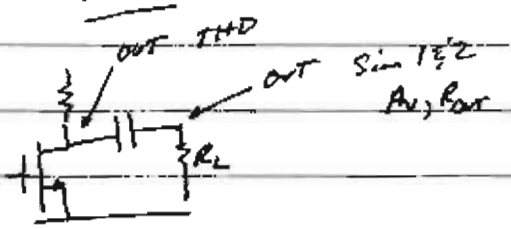
$R_{out} = \frac{V_{oc}}{I_{sc}}$



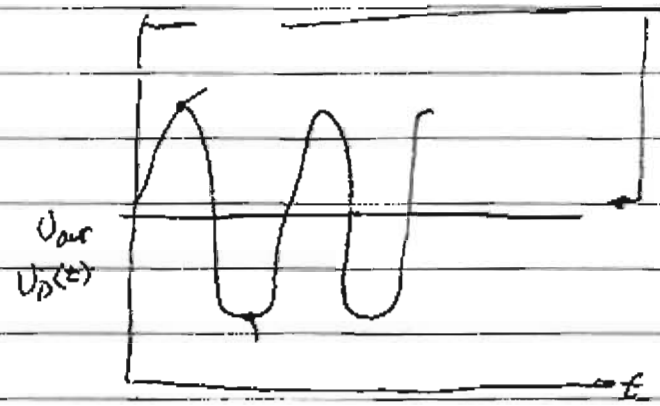
RL1 V(RL1:2) -
RL2 V(RL2:2) -

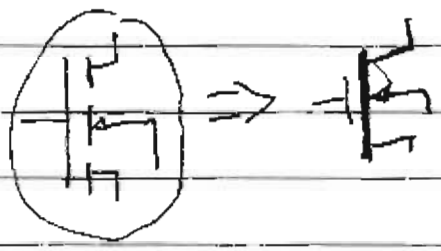


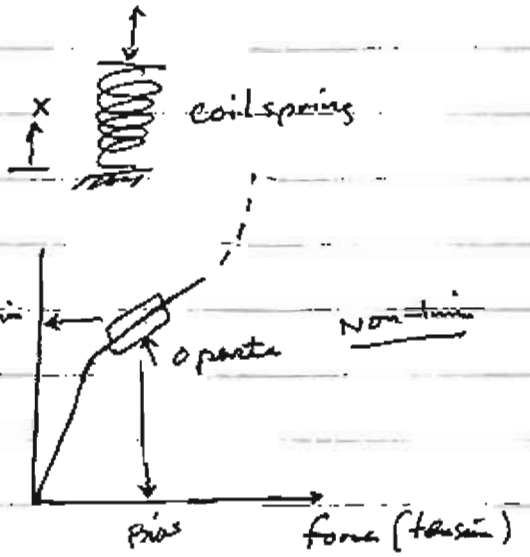
1 MHz



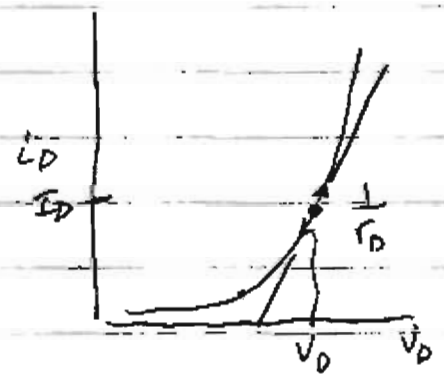
DC component of $v_D(t) \equiv$ bias value





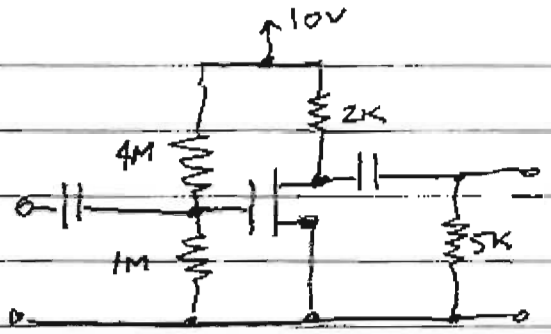


$\frac{\Delta x}{\Delta f}$ => linear



DIODE

1. Bias calculations (dc) => Q Point
2. determine linear parameters @ Q Point
3. analysis via linear circuit theory

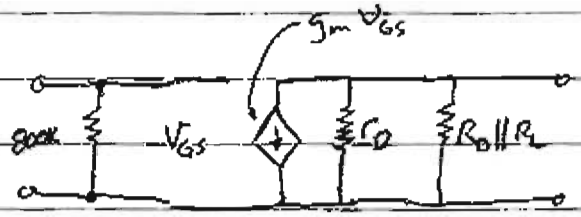


Bias: $I_G = 0$

$V_G = \frac{1}{5} \cdot 10 = 2V$, $I_{RG} = 10/5EL = 2\mu A$

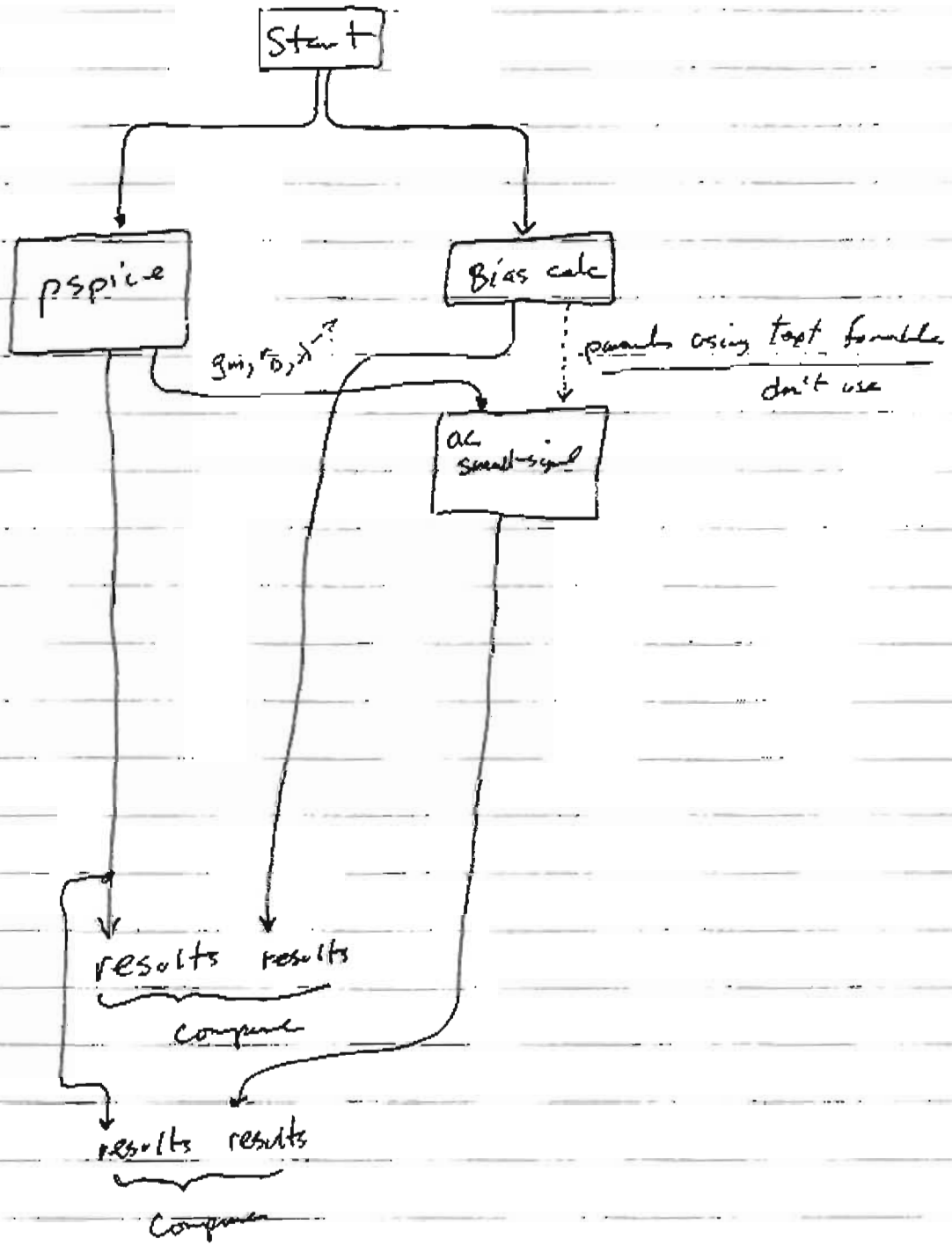
$I_D = f(V_G)$

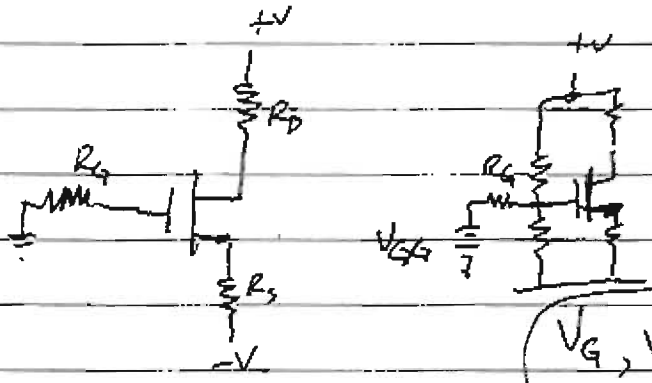
$V_D = V_{cc} - R_D I_D$



$g_m = f(I_D, V_{DS}) \simeq f(I_D)$

@ ac $R = \frac{\partial V}{\partial I} = \frac{dV}{dI}$; $dV = 0$


Start
pspice
Bias calc
g_m, r_o, λ
parameters using text formula
don't use
AC small-signal
results
results
Compare
results
results
Compare



V_G, V_S $\Rightarrow$ V_{GS}

V_{GS} $\Rightarrow$ I_D $\Rightarrow$ V_{DS}