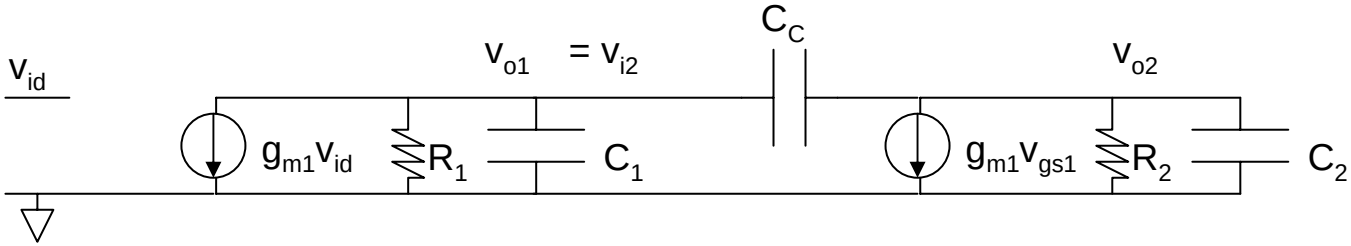
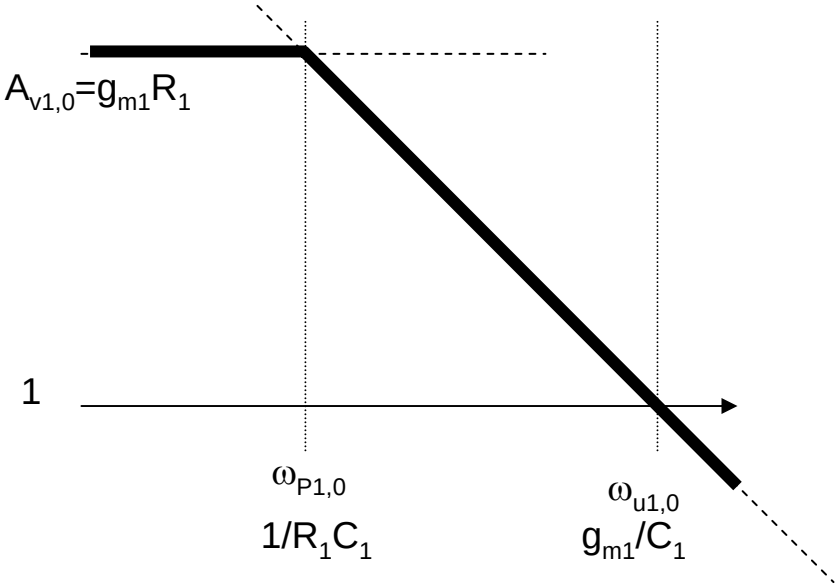
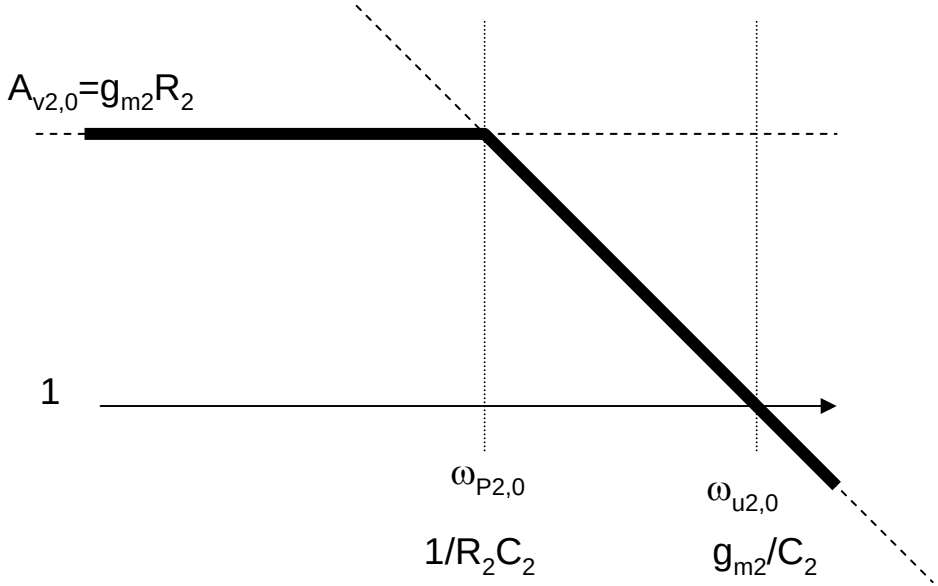
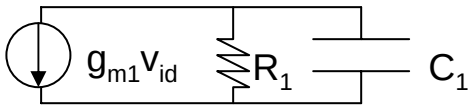
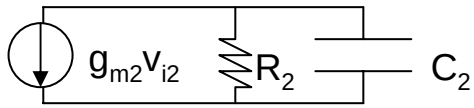
1st and 2nd stage gain with Cc=0



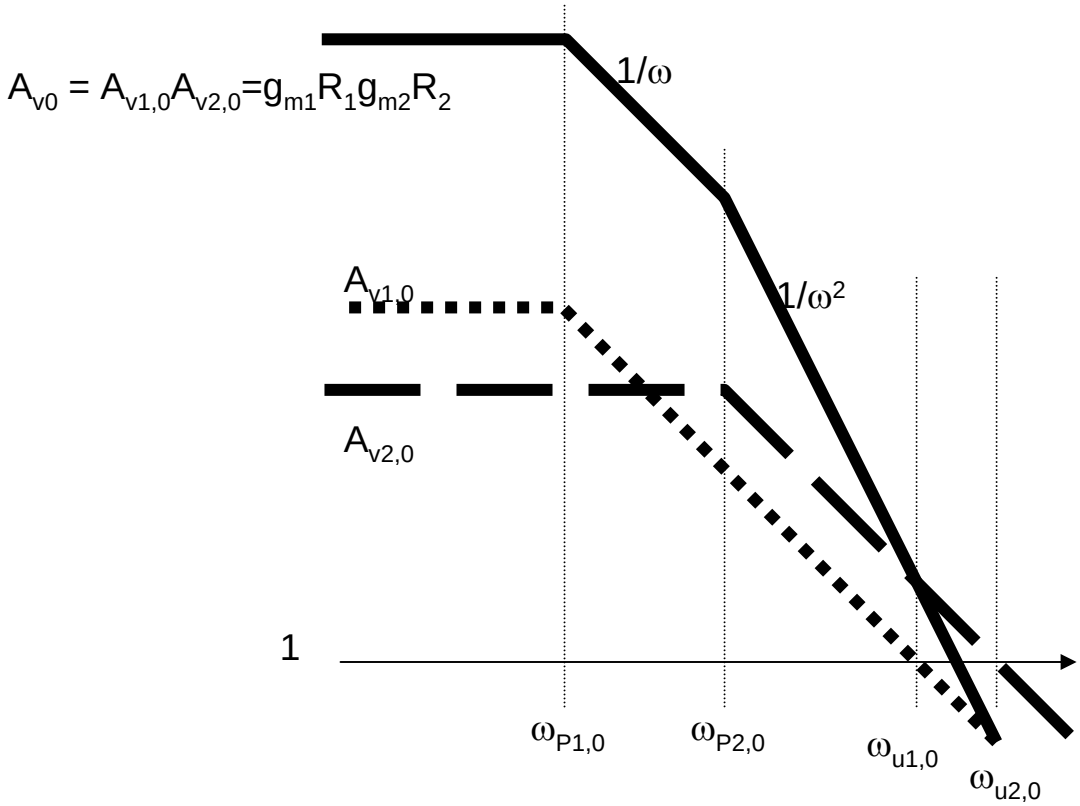








Overall gain with Cc=0



Things to think about:

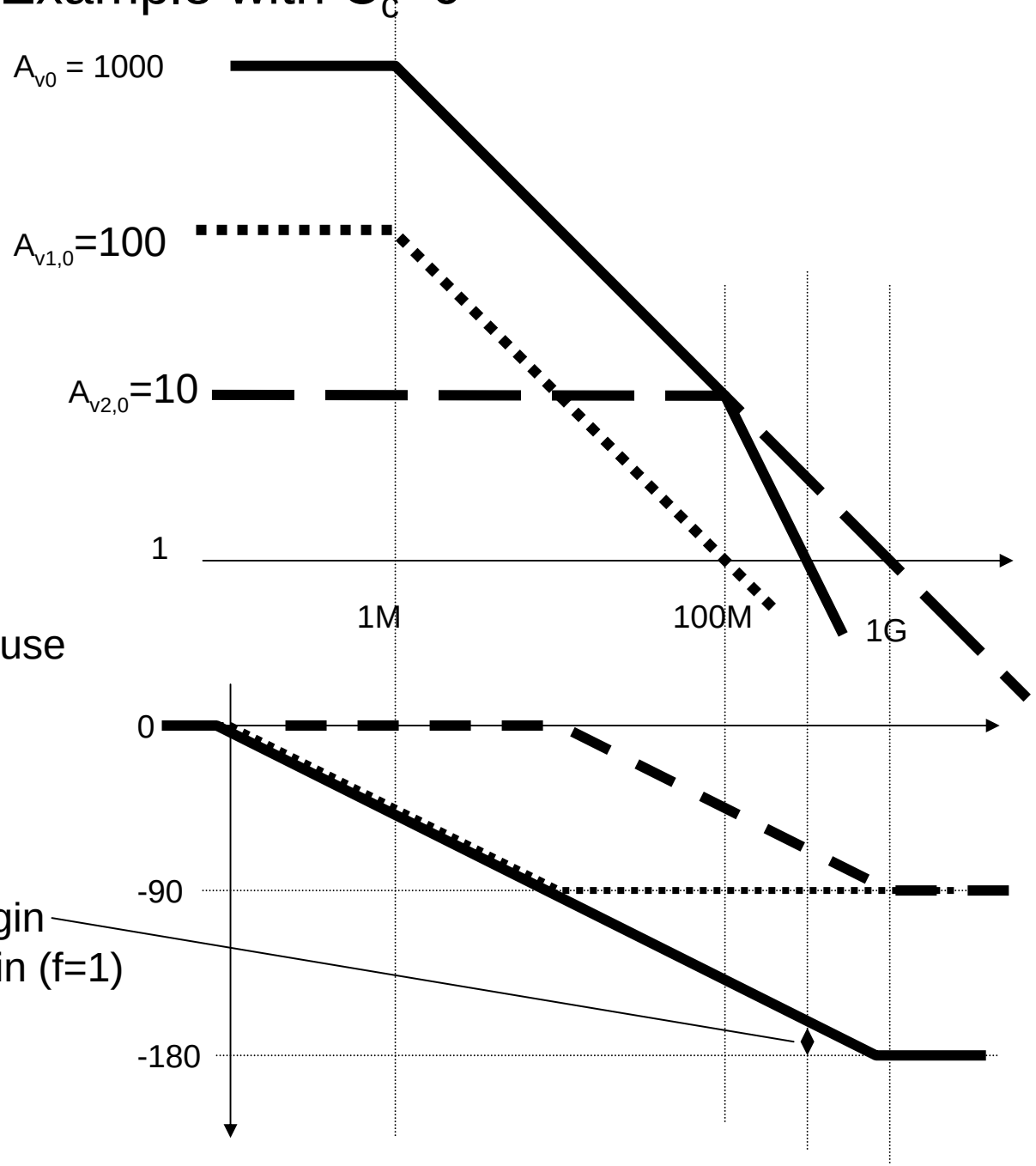
1. What is the equation for gain between the first two poles?
2. What is the equation for gain after the second pole?
3. What is the gain at the first-stage unity gain frequency?
4. What is the gain at the second-stage unity gain frequency?
5. What is the unity gain frequency?

Example with C_c=0

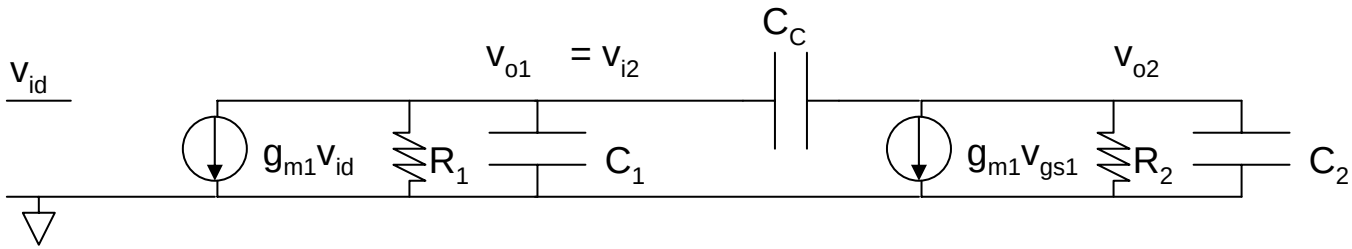
g_{m1}= 1mS
R_1=100k
C1=10pF
g_{m2}= 10mS
R_2=1k
C2=10pF

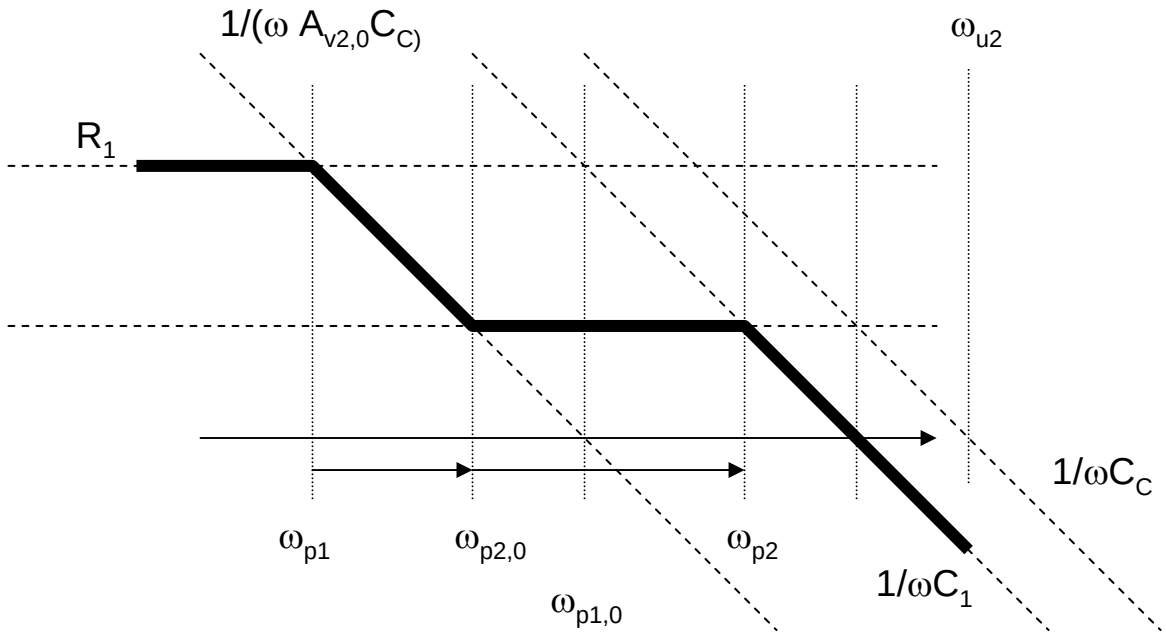
$A_{v1,0}$= 100
ω_{p1}=1M
ω_{u1}=100M
$A_{v2,0}$= 10
ω_{p2}=100M
ω_{u2}=1G

What's the phase margin?
What's the phase margin if I use this amplifier with f=0.1?

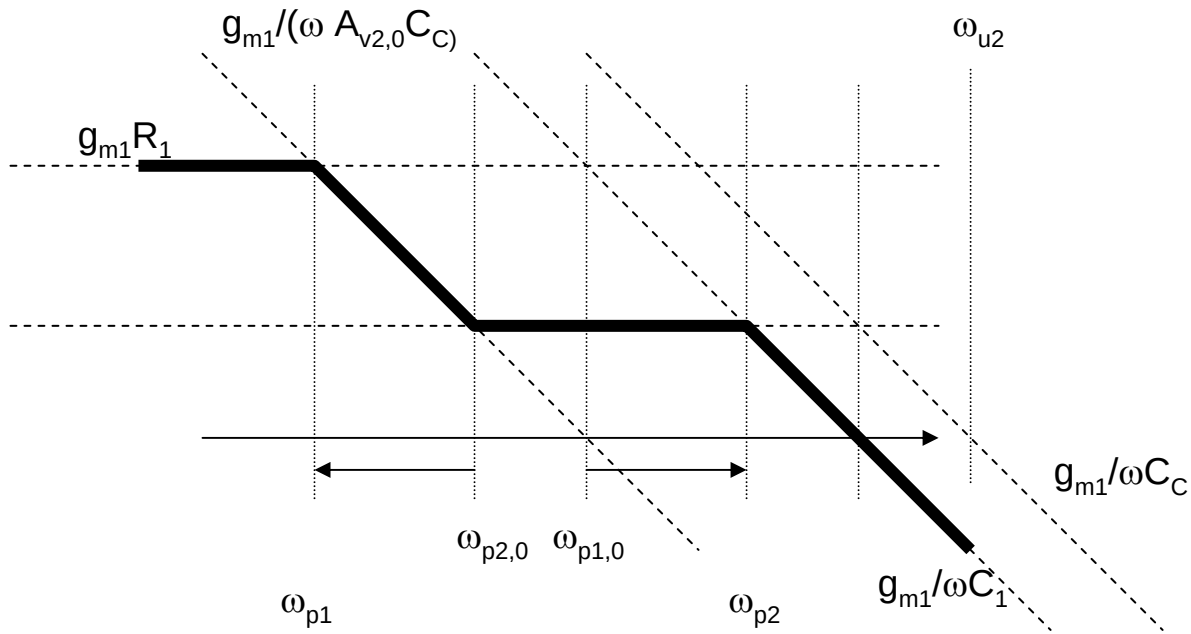


Z_{o1} with $A_{v2,0}C_c > C_1 > C_c$





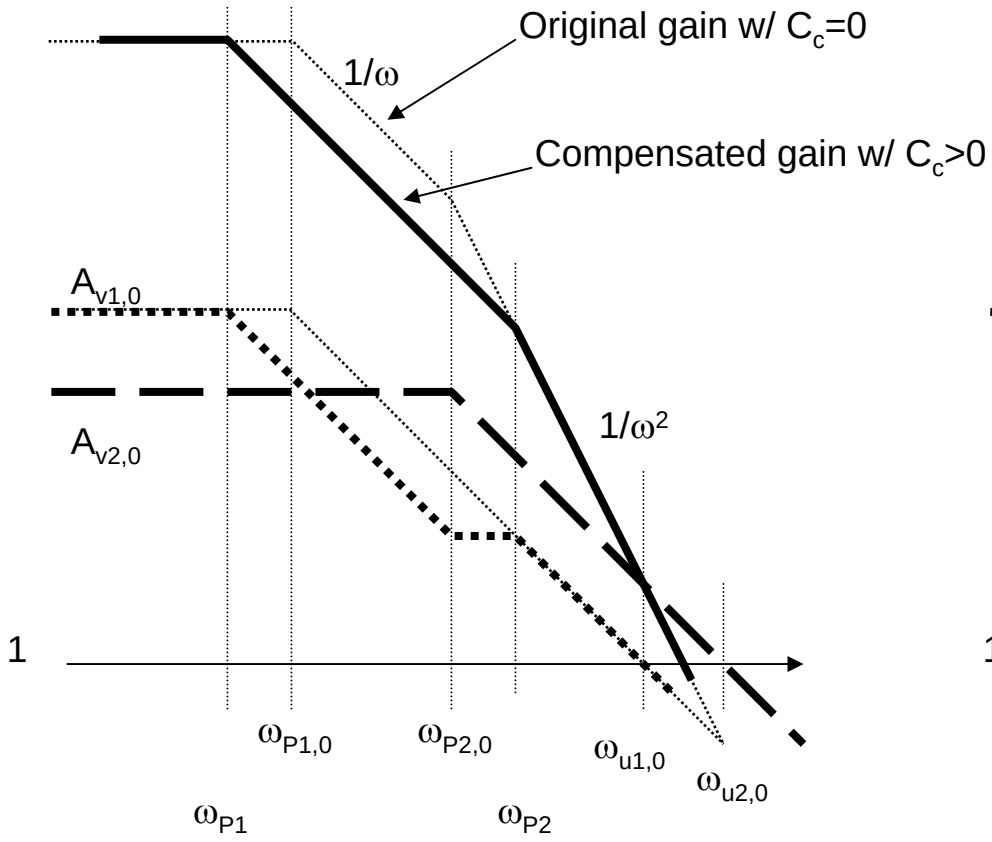
$A_{v1} = g_{m1}Z_{o1}$ with $A_{v2,0}C_c > C_1 > C_c$



Things to think about:

1. What's the equation for the gain in the various sections?
2. What does the curve look like if $C_c > C_1$?
3. What does the curve look like if $\omega_{p2,0} > \omega_{p1,0}$
4. What is the frequency ratio of the old and new first pole?
5. What is the frequency ratio of the old and new second pole?
6. Answer questions 4 & 5 assuming 2 and/or 3.

Overall gain with $C_1 > C_c > 0$



Overall gain with $\omega_{p2} > \omega_u$