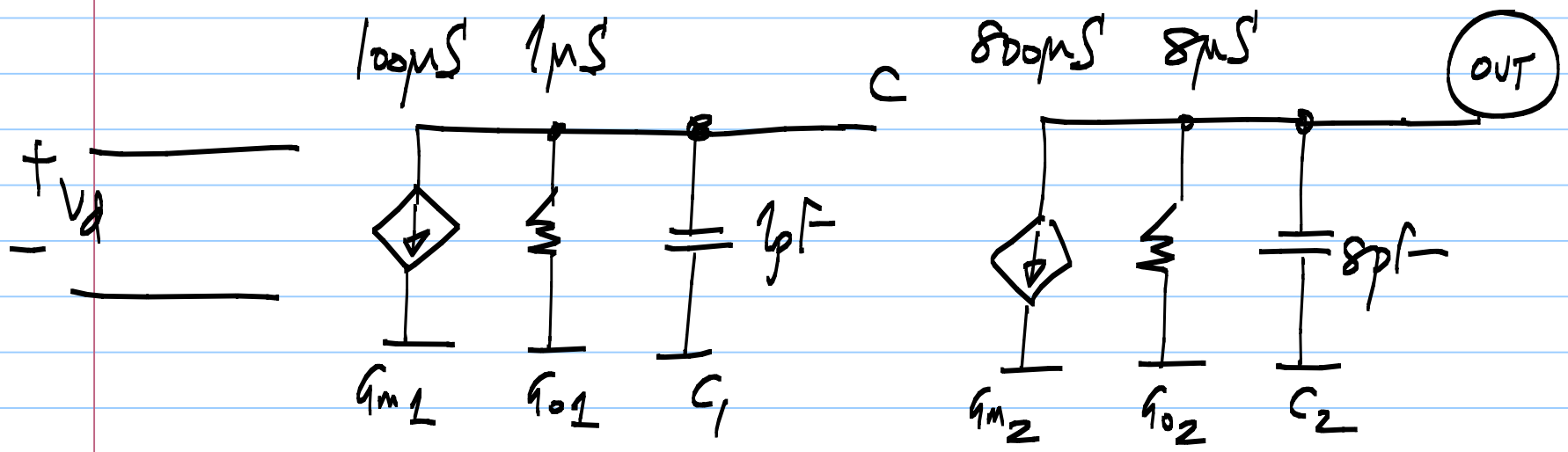
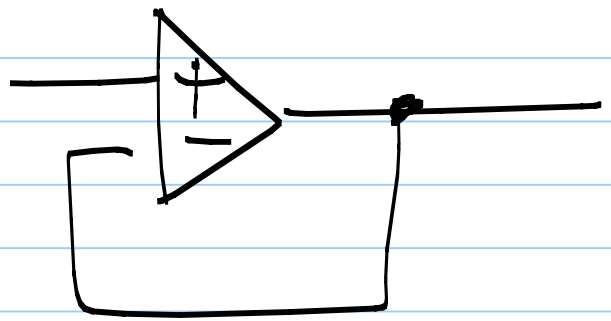
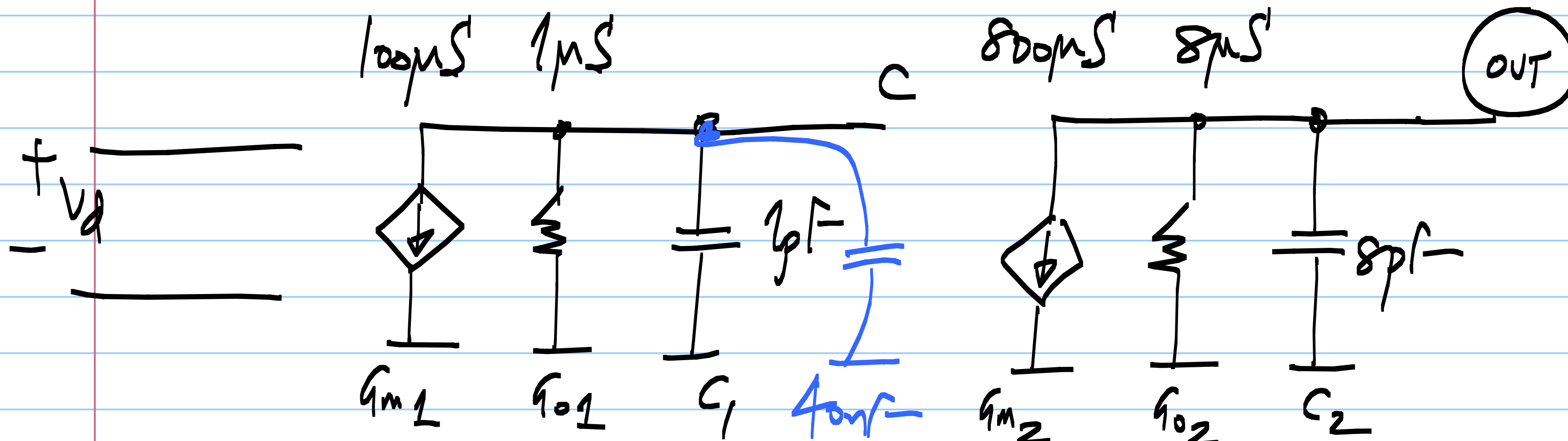




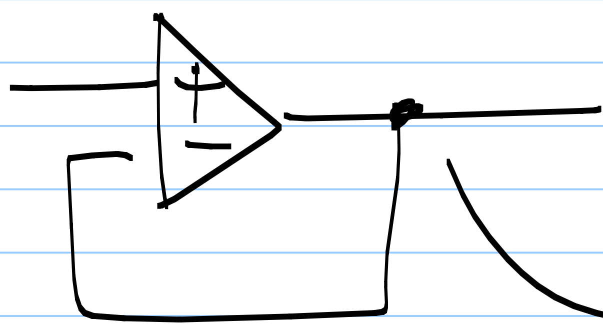
$p_1, p_2 = -1\,\text{Mrad/s}$

(poor damping factor)

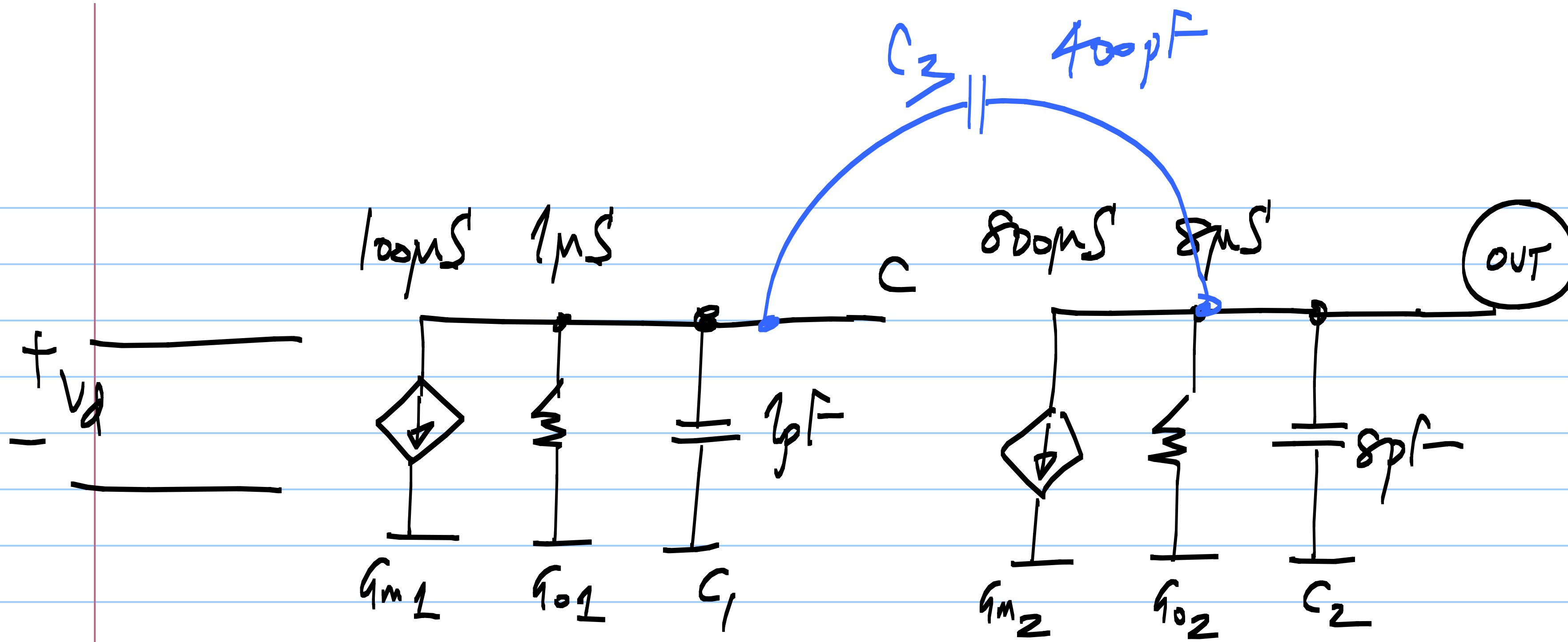


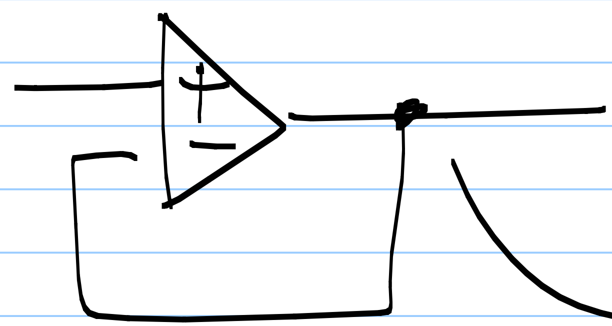
$-p_1 = 25$ rad/s ; $\omega_{u,loop} =$ 250 krad/s

$-p_2 = 1$ Mrad/s



BW =

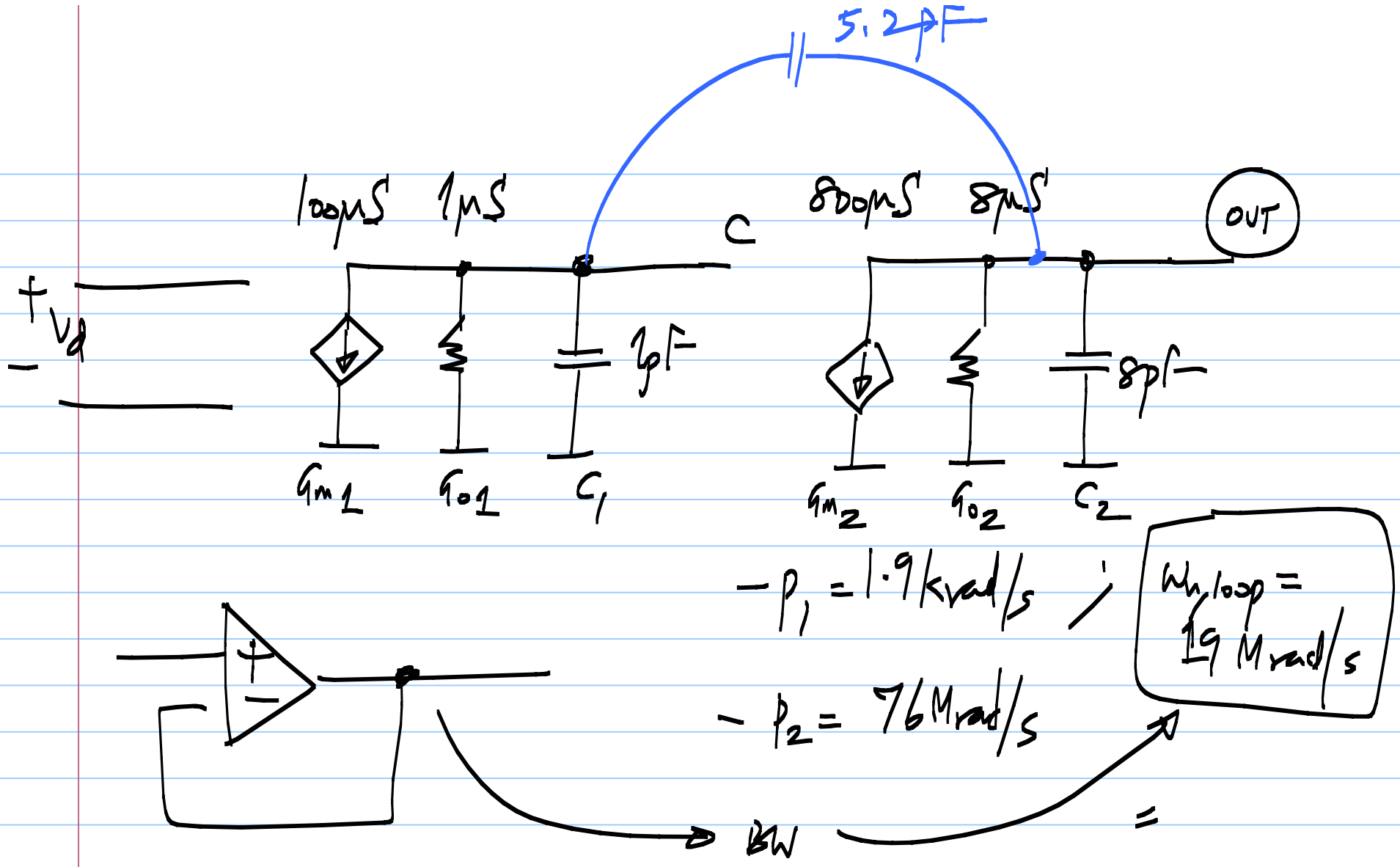




$-p_1 = 25\,rad/s$; $\omega_{u,loop} =$ $250\,krad/s$

$-p_2 =$ ~~$1\,Mrad/s$~~ $87\,Mrad/s$

BW =


5.2pF
100μS
1μS
C
800μS
8μS
OUT
+
V_d
−
7pF
8pF
g_{m1}
g_{o1}
C_1
g_{m2}
g_{o2}
C_2
$-p_1 = 1.9$krad/s
$-p_2 = 76$Mrad/s
$\omega_{n,loop} = 19$ Mrad/s
BW
=

$$\frac{V_o(s)}{V_d(s)} = \frac{A_1 A_2 \left(1 - \frac{s}{z_1}\right)}{\left(1 + \frac{s}{p_1}\right)\left(1 + \frac{s}{p_2}\right)}$$

$$z_1 = \frac{g_{m_2}}{C_3}$$

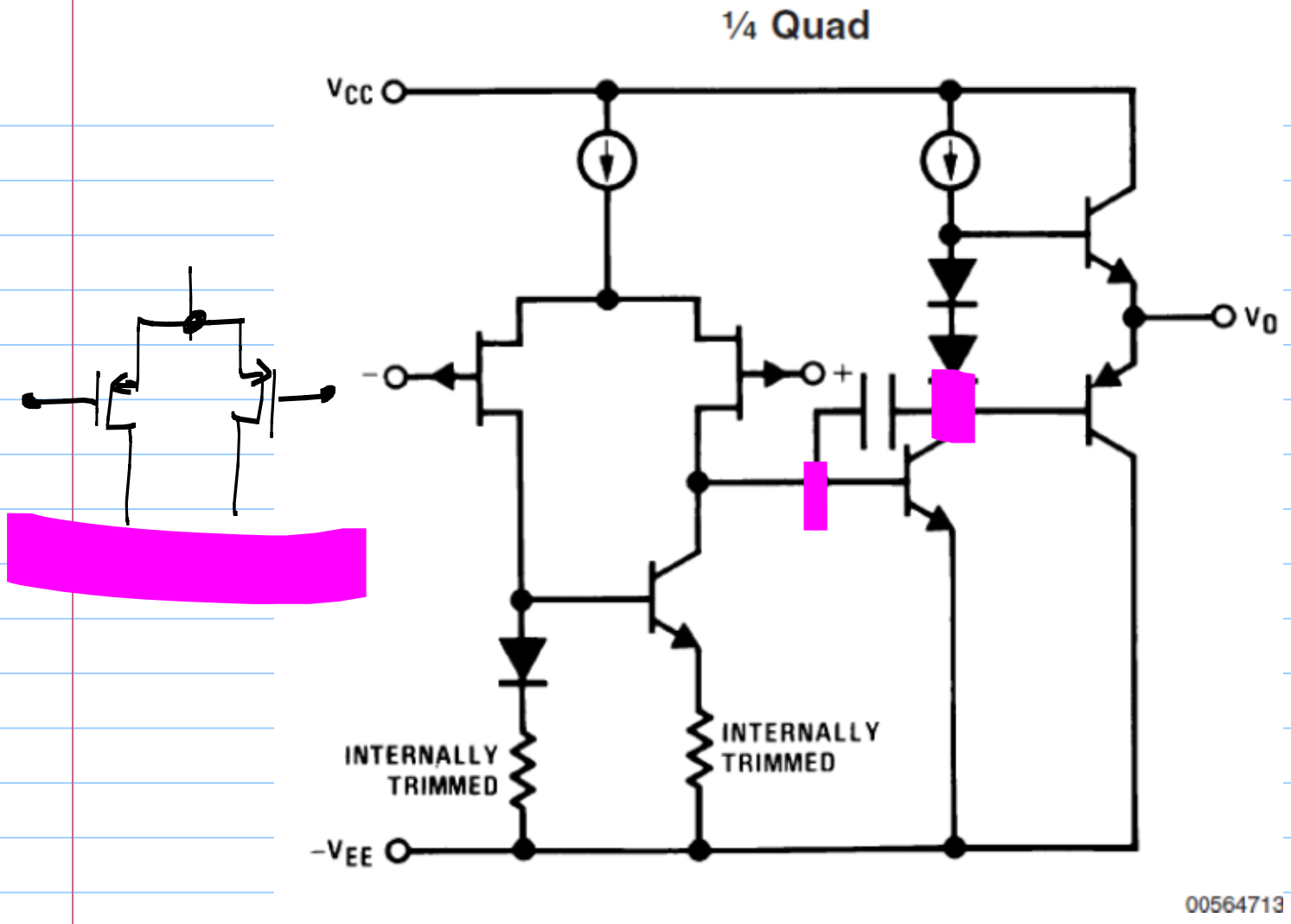
$$\angle \Big|_{\omega_{u,loop}} = -\tan^{-1}\frac{\omega_{u,loop}}{z_1} - \tan^{-1}\frac{\omega_{u,loop}}{p_1} - \tan^{-1}\frac{\omega_{u,loop}}{p_2}$$

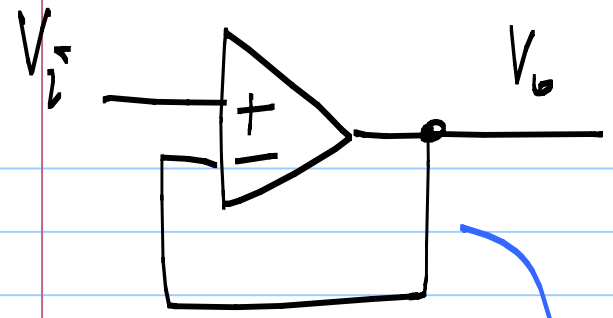
$\omega_{u,loop}$

$\underbrace{\qquad}_{-7^\circ}$ $\underbrace{\qquad}_{-90^\circ}$ $\underbrace{\qquad}_{-14^\circ}$

$-\tan^{-1}\frac{g_{m_1}}{g_{m_2}}$

$-111^\circ \Rightarrow PM = 69^\circ$


¼ Quad
VCC
VO
−
+
INTERNALLY TRIMMED
INTERNALLY TRIMMED
−VEE
00564713

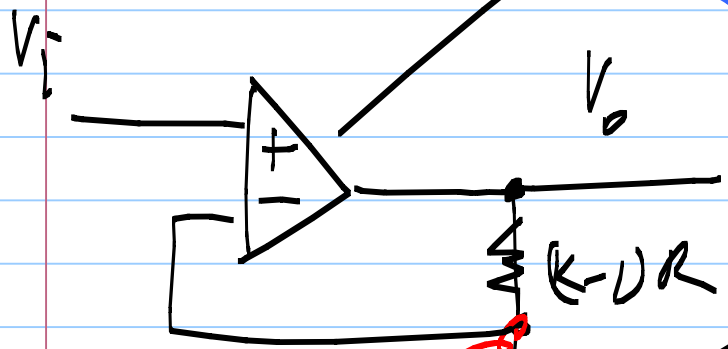


$$A(s) = \frac{A_1 A_2 \left(1 - s/z_1\right)}{\left(1 + \frac{s}{p_1}\right)\left(1 + \frac{s}{p_2}\right)}$$

$$L(s) = A(s)$$

OPAmp: $\omega_{n,opA} : A_0 p_1 \simeq \frac{G_{m1}}{C_3}$

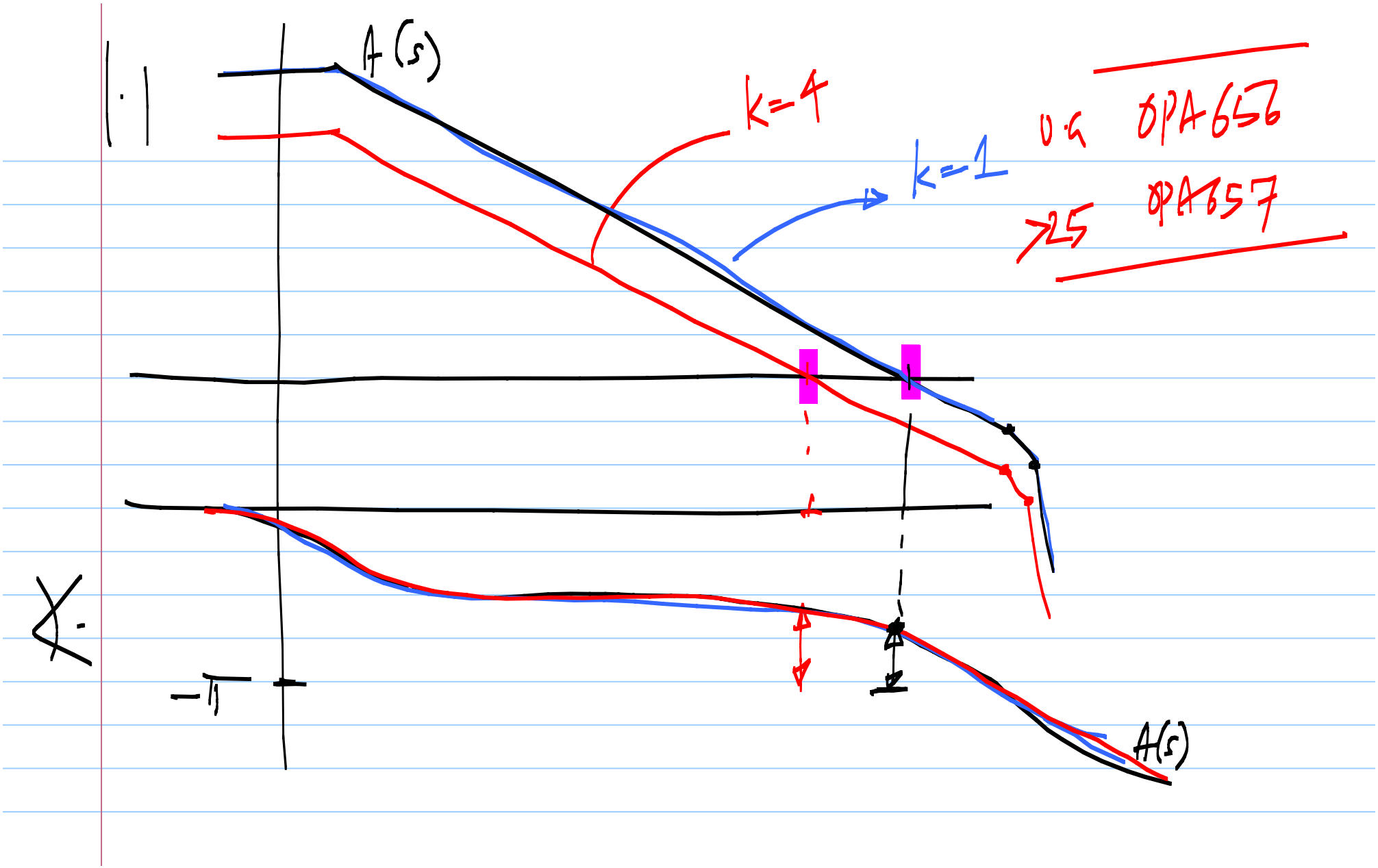
$$p_2 = 4 \cdot G_{m1}/C_3$$



FBloop: $\omega_{n,loop} = \frac{A_0 p_1}{K} \simeq \frac{1}{K} \cdot \frac{G_{m1}}{C_3}$

$$L(s) = \frac{A(s)}{K}$$

$$p_2 = 4 \cdot \frac{1}{K} \cdot \frac{G_{m1}}{C_3}$$


1:1
A(s)
k=4
k=1
o.g OPA656
>25 OPA657
X:
-π
A(s)

$$G_{m_2} - sC_3 \rightarrow G_{m_2} - \frac{sC_3}{1+sC_3R_3}$$

$$R_3 = \frac{1}{G_{m_2}}$$

$$= \frac{\left[G_{m_2} + sC_3\left(G_{m_2}R_3 - 1\right)\right]}{\cancel{\left(1+sC_3R_3\right)}}$$