

# FREQUENCY RESPONSE

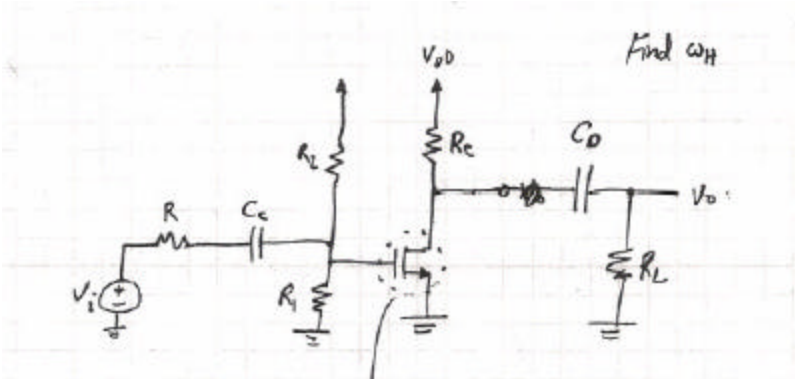
## Another Approximation:

- Sometimes poles and zeros of an amplifier may be hard to determine
- An approximation of the high frequency 3dB point,  $\omega_H$  is:

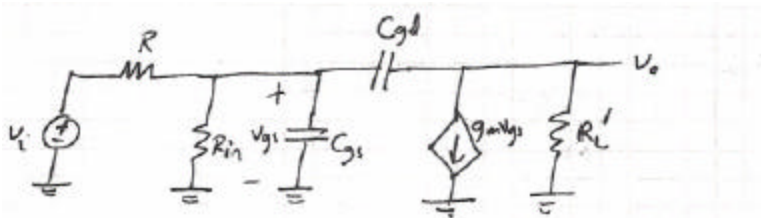
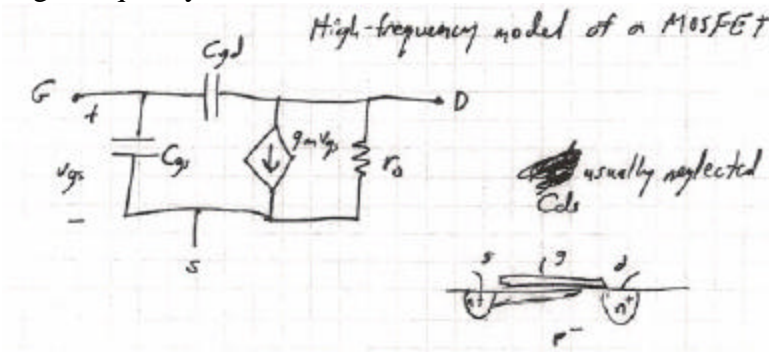
$$\omega_H \approx \frac{1}{\sum_i C_i R_{i0}}$$

where for each capacitor  $\rightarrow C_i, R_{i0}$  is the resistance seen by that specific capacitor with:

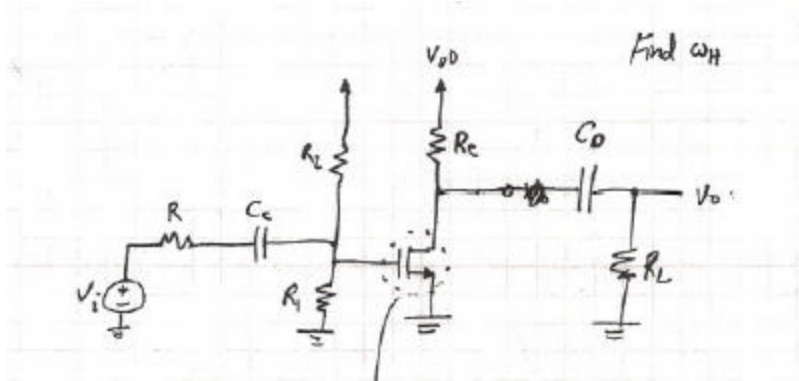
- Other caps = 0 (open circuit)
- Input = 0



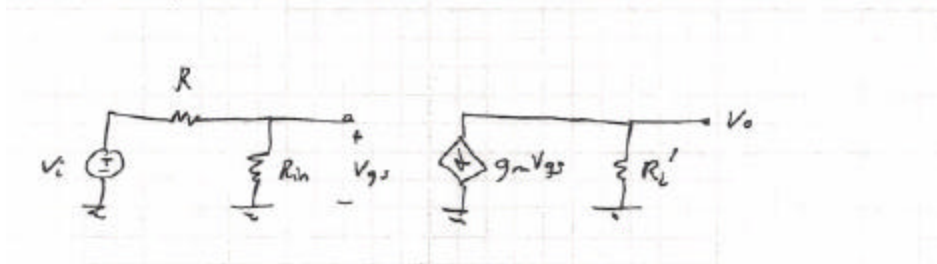
High frequency model:



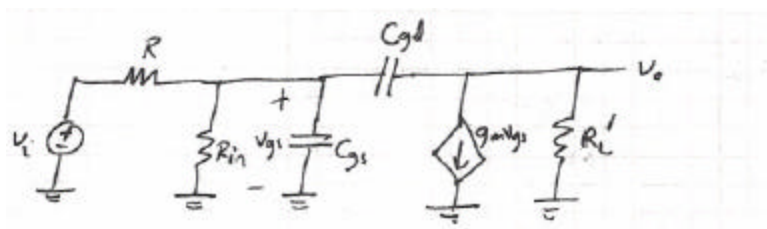
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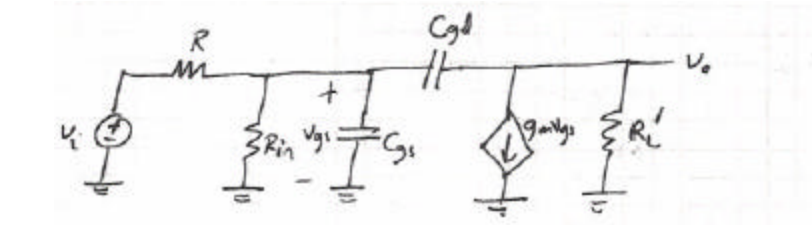
Midband gain:



- Find time constant due to  $C_{gs} =$
- Set other caps =
- Set input =

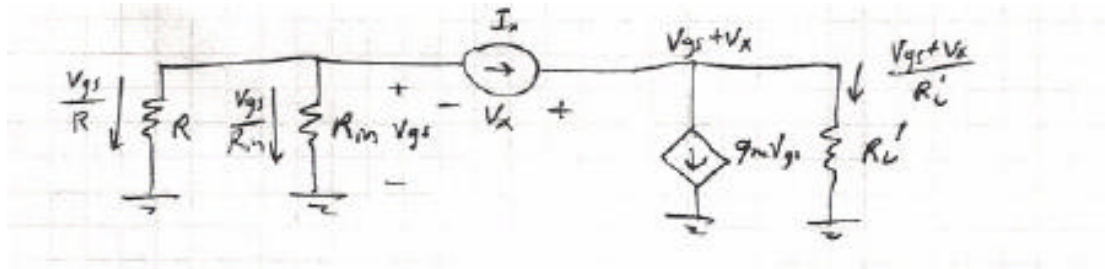


- Find time constant due to  $C_{gd} =$
- Set other caps =
- Set input =



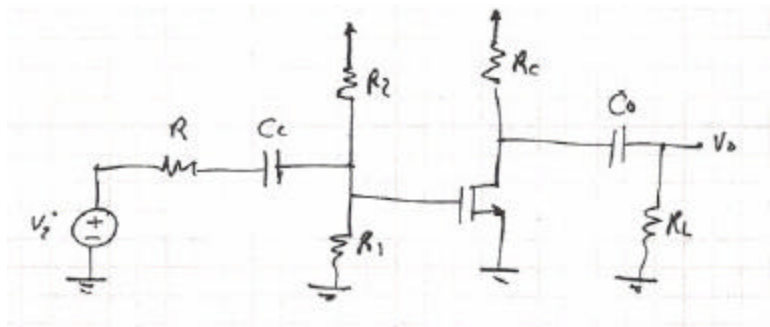
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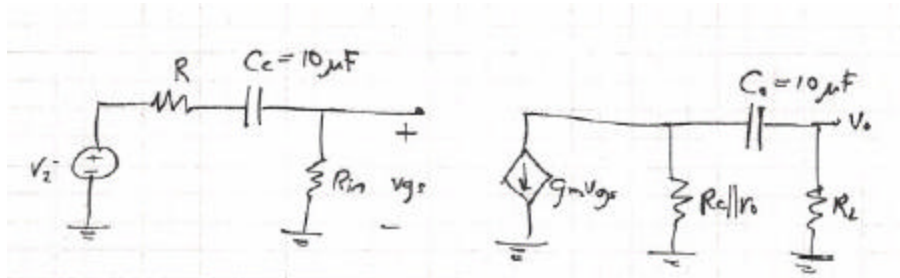


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## Miller Capacitors:



Find  $f_L$ :



Approximation is done by \_\_\_\_\_:

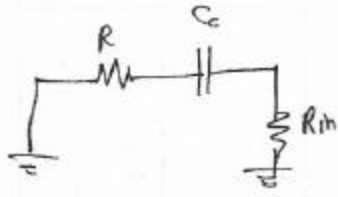
$$\omega_L \approx \sum_i^{n_L} \frac{1}{C_i R_{is}}$$

- Set input = 0
- Set all other caps to short circuit
- $R_{is}$  is the resistance seen by  $C_i$

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$\tau_c$ :



$T_0$ :

