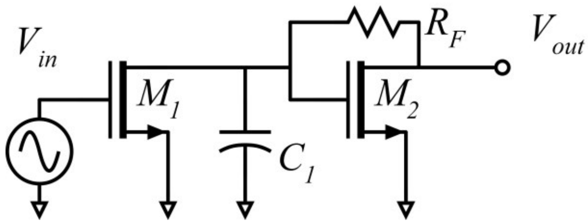
Problem 1: Ignore DC bias analysis. You don't need it. The two transistors have transconductance gm1 and gm2 and respectively. Their output resistances Rds1 and Rds2 are both infinity, while the transistor capacitances $C_{gs} = C_{gd}$ =0.



a) Draw a small-signal equivalent circuit of the circuit

(b) USING NODAL ANALYSIS, compute Vout(s)/Vin(s) in ratio-of-polynomials form

$$V_{out}(s)/V_{in}(s) = A_{v,mid-band} \times (s\tau)^m \times \frac{1+b_1 s + b_2 s^2 + ...}{1+a_1 s + a_2 s^2 + ...}$$

here m, an integer, can be positive or negative or zero.

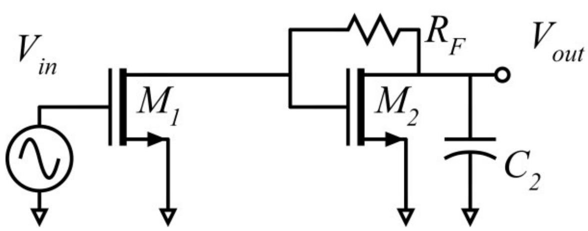
(b) Now set gm1=1 mS. gm2=2 mS. RF=10 kOhm. C1=100 fF

c) Find any/all pole and zero frequencies of the transfer function, in Hz:

d)Draw a clean Bode Plot of ||Vout||/||Vin|| in dB vs. frequency (log scale)

LABEL AXES, LABEL all relevant gains and pole or zero frequencies, Label Slopes

Problem 2: Ignore DC bias analysis. You don't need it. The two transistors have transconductance gm1 and gm2 respectively. Their output resistances Rds1 and Rds2 are both infinity, while the transistor capacitances $C_{gs} = C_{gd}$ =0.



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(b) Now set gm1=1 mS. gm2=2 mS. RF=10 kOhm. C2=200 fF

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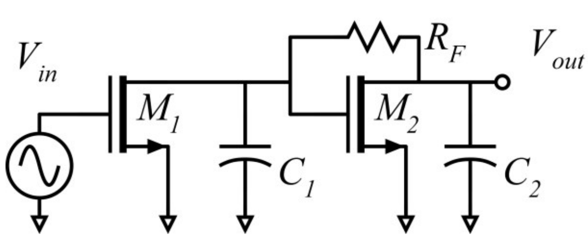
Problem 3: Ignore DC bias analysis. You don't need it. The two transistors have transconductance gm1 and gm2 respectively. Their output resistances Rds1 and Rds2 are both infinity, while the transistor capacitances $C_{gs} = C_{gd}$ =0.



a) Draw a small-signal equivalent circuit of the circuit

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$V_{out}(s)/V_{in}(s) = A_{v,mid-band} \times (s\tau)^m \times \dfrac{1+b_1 s+b_2 s^2+...}{1+a_1 s+a_2 s^2+...}$

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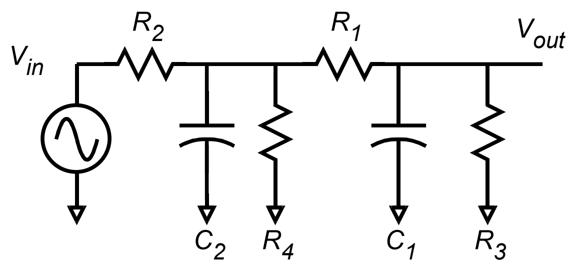

Problem 4: R1=2 KOhm, R2=3kOhm, R3=4kOhm, R4=8 kOhm, C1= 1 fF C2=2 fF
Using Nodal analysis , find the transfer function Vout(s)/Vgen(s). Give the answer in standard form

$$\frac{V_{out}(s)}{V_{gen}(s)} = \left.\frac{V_{out}}{V_{gen}}\right|_{DC} \frac{1+b_1 s+b_2 s^2+...}{1+a_1 s+a_2 s^2+...}$$