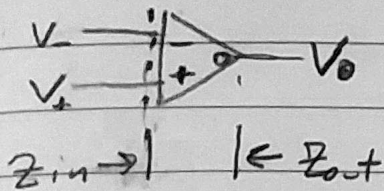


Homework on ideal Op-Amps (H.W. 4)



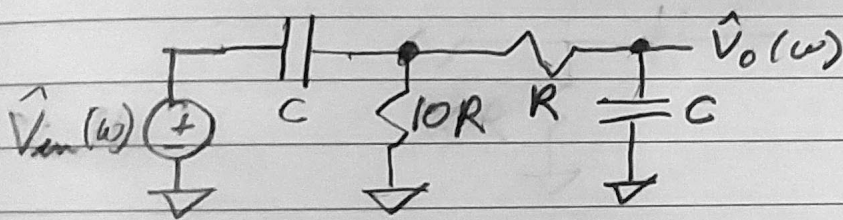
$$V_o = A (V_+ - V_-)$$

↑ Open loop gain

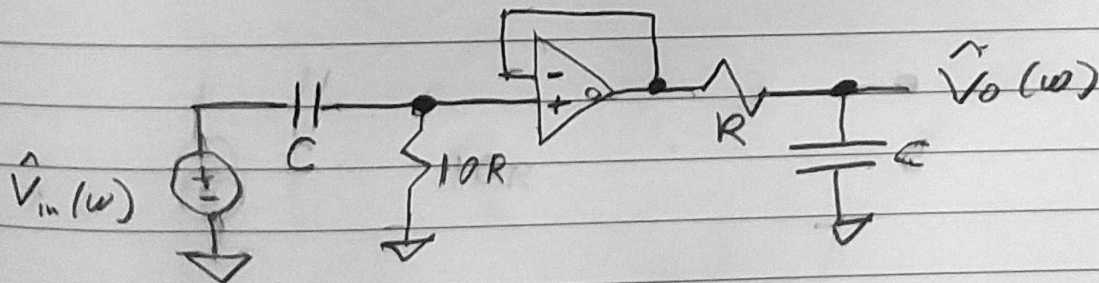
$$Z_{in} \sim \infty$$

$$Z_{out} \sim 0$$

- ① Solve for $\hat{V}_o(\omega)$ and draw a Bode plot for magnitude & phase. Identify "break" frequencies.

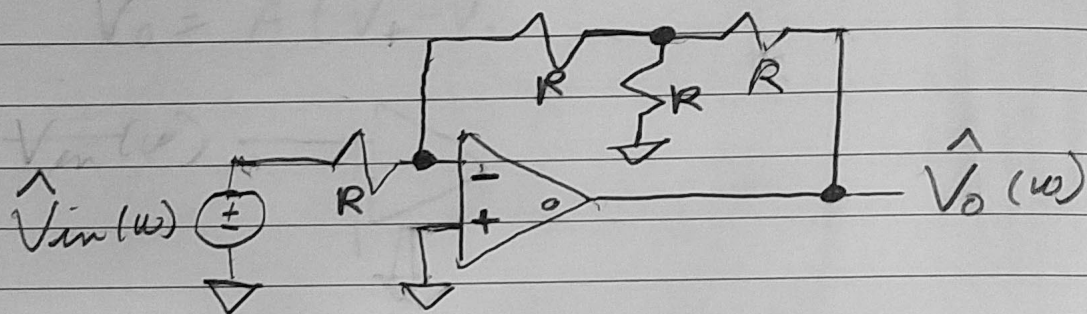


- ② Repeat this analysis for the circuit below, under the assumption $A \rightarrow \infty$.

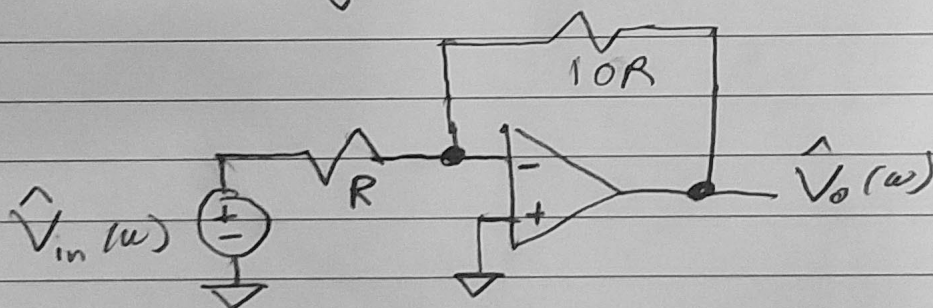


- ③ Why do the circuits in ① and ② have different "break" frequencies?

- ④ Solve for $\hat{V}_o(\omega)$ in the circuit below with the assumption $A \rightarrow \infty$.



- ⑤ Solve for $\hat{V}_o(\omega)$ in the inverting amplifier below for the case of finite open loop gain "A".



- Plot the closed loop gain, $|\hat{V}_o(\omega)|/|\hat{V}_{in}(\omega)|$, as a function of A. Use a logarithmic scale from $A=100$ to $A=0.1$. Label your axes! What is the gain at $A=1$?