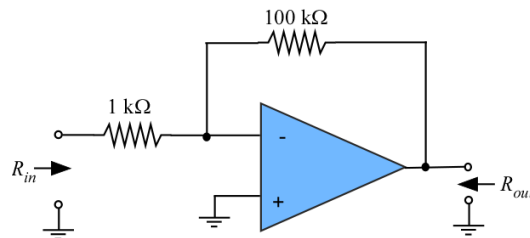
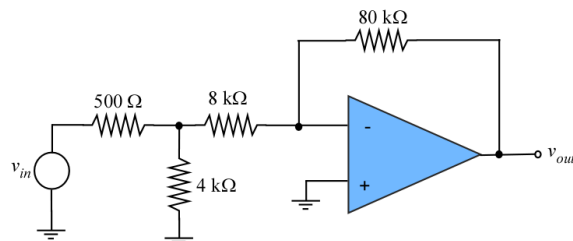


1. Assuming $A_{MBoa} = 200,000$ V/V, find R_{in} , R_{out} , and the circuit shown. If the op amp GBW is 4×10^6 Hz, what is the upper 3-dB frequency of the amplifier (*Hint: R_{out} can be approximated.*)

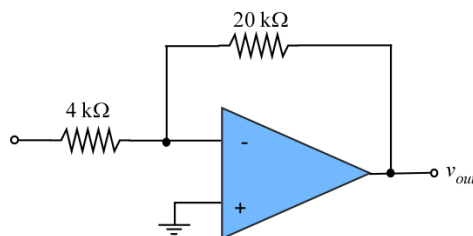


2. For the amplifier of the figure:

- (a) Calculate $A_{MB} = v_{out}/v_{in}$
- (b) If the GBW of the op amp is 4 MHz, what is the upper corner frequency of the voltage gain?
- (c) Write an expression for the voltage gain as a function of frequency.



3. The upper corner frequency of the voltage gain for the circuit shown is found to be 150 kHz. What is the GBW of the op amp?



4. Identical op amp stages with $GBW_{oa} = 10^7$ Hz are available to construct an amplifier with overall midband gain of 600 V/V and an overall bandwidth of 800 kHz or more.

- (a) What is the minimum number of stages required?
- (b) What is the midband voltage gain of each stage?