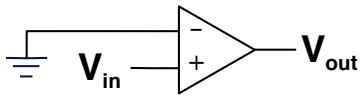
EE 16B Designing Information Devices and Systems II
Fall 2015 Section 12B

For each problem, assume the op-amp has a nominal gain of $G = 100$.

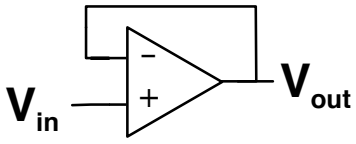
1. Op-Amps Without Feedback



(a) For the circuit above, write $H(\omega) = V_{out}/V_{in}$.

(b) If G is 20% lower that its nominal value, what is the percent error in $H(\omega)$ relative to nominal?

2. Op-Amps With Feedback

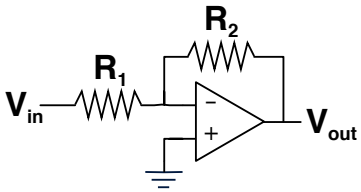


(a) For the circuit above, approximate V_{out}/V_{in} using the op-amp golden rules.

(b) Now write V_{out}/V_{in} **without** the second op-amp golden rule (you can still assume no current flows into the amplifier inputs). How close is the result to the approximation from (a)? (Give a percentage.)

(c) Now assume G is 20% lower that its nominal value. What is the percent error in V_{out}/V_{in} relative to the approximation from (a)?

3. Inverting Amplifier



(a) For the circuit above, approximate V_{out}/V_{in} using the op-amp golden rules.

(b) Now write V_{out}/V_{in} without the second op-amp golden rule (you can still assume no current flows into the amplifier inputs).

(c) If $R_1 = 100\Omega$ and $R_2 = 500\Omega$, find the gain of the circuit using the models from both (a) and (b). What is the percent error?

(d) Now assume G is 20% lower that its nominal value and recalculate the gain. What is the new percent error compared to (a)?