

This homework is due Wednesday, April 5, 2017, at 23:59.

Self-grades are due Saturday, April 8, 2017, at 23:59.

Submission Format

Your homework submission should consist of **one** file.

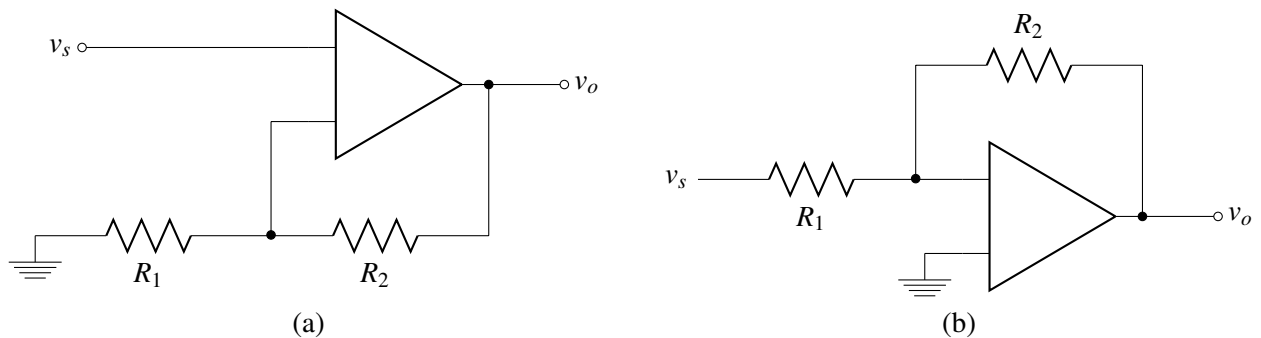
- `hw9.pdf`: A single pdf file that contains all your answers (any handwritten answers should be scanned). If you used an IPython notebook, it should also be saved as a pdf.

If you do not attach a pdf of your IPython notebook, you will not receive credit for problems that involve coding. Make sure your results and plots are showing.

Submit this file to the appropriate assignment in Gradescope.

1. Basic Amplifier Building Blocks

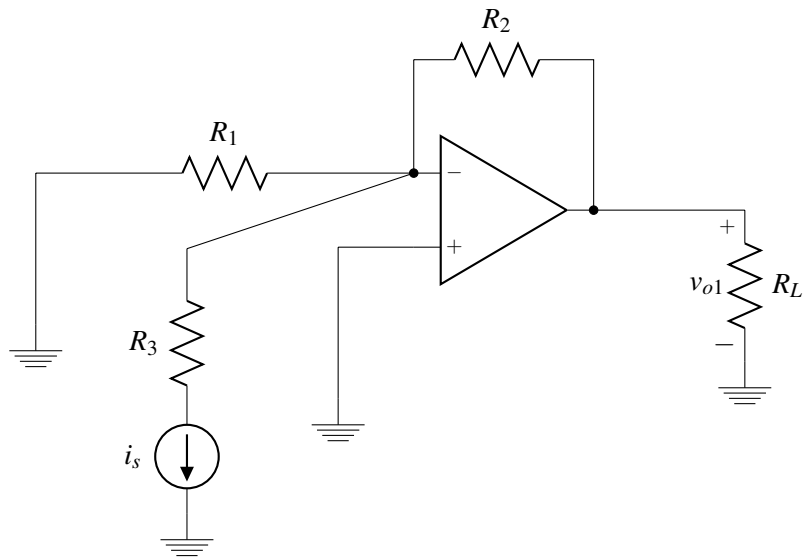
The following amplifier stages are used often in many circuits and are well known as (a) the non-inverting amplifier and (b) the inverting amplifier.



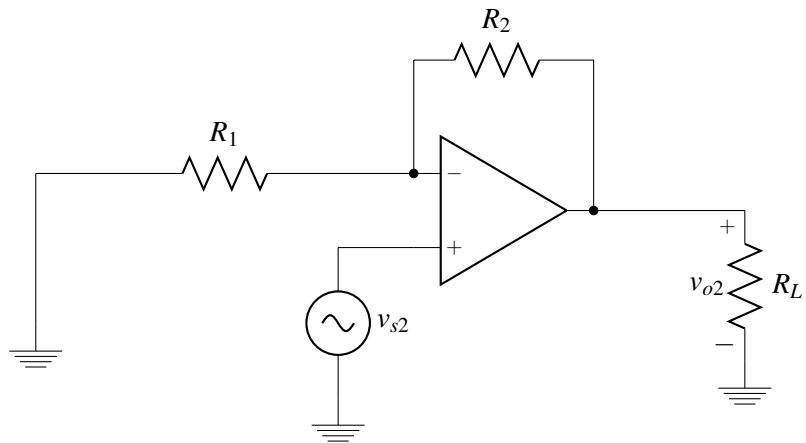
- Label the input terminals of the Op-amp so it is in negative feedback. Then, derive the voltage gain of the non-inverting amplifier using the Golden Rules. Explain the origin of the name of the amplifier.
- Label the input terminals of the Op-amp so it is negative feedback. Then, derive the voltage gain of the inverting amplifier using the Golden Rules. Explain the origin of the name of the amplifier.

2. Amplifier with Multiple Inputs

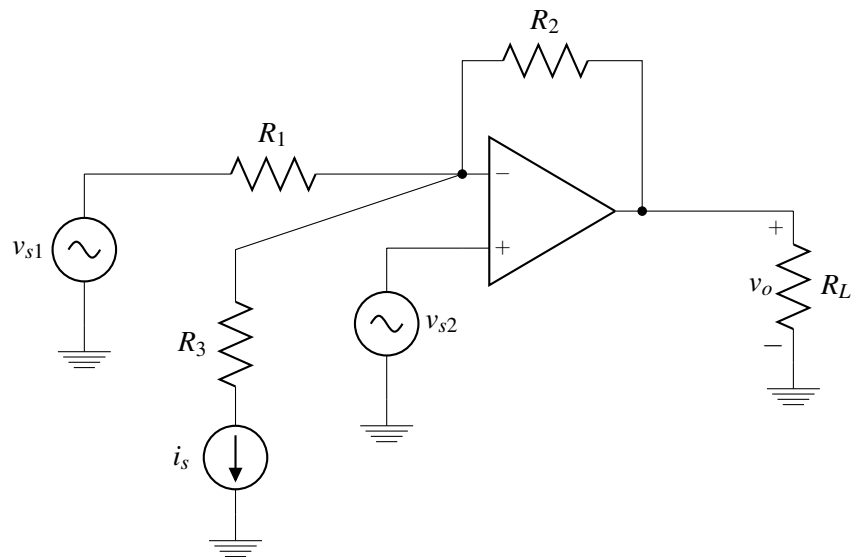
- Use the Golden Rules to find v_{o1} for the circuit below.



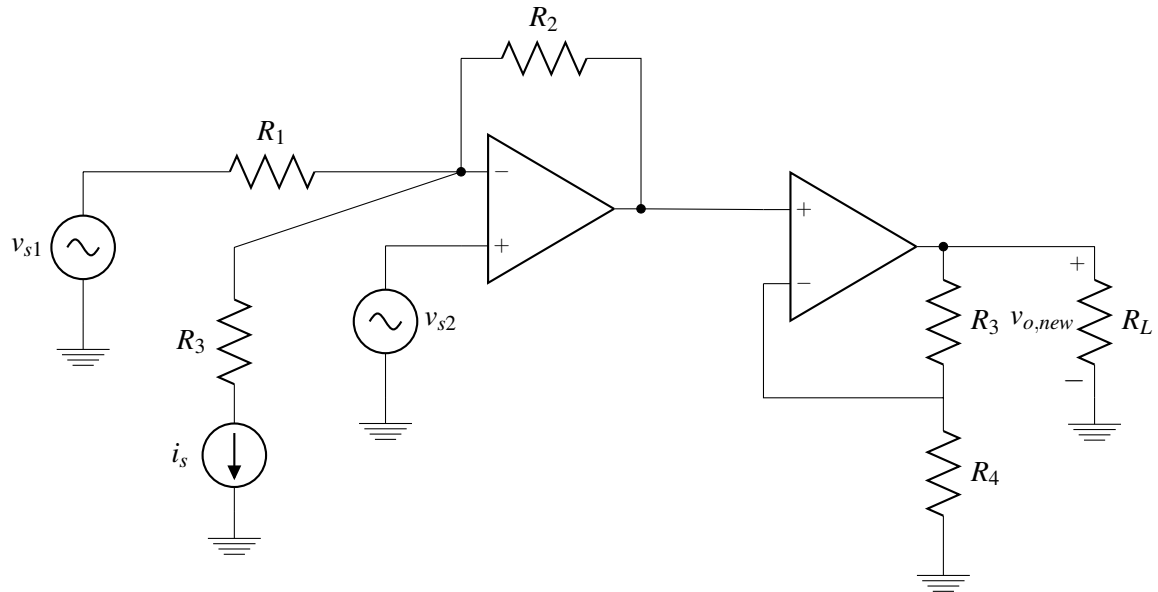
(b) Use the Golden Rules to find v_{o2} for the circuit below.



(c) Use the Golden Rules to find the output voltage v_o for the circuit shown below.



- (d) Now add a second stage as shown below. What is $v_{o, \text{new}}$? Does v_o change between the last part and this part? Does the voltage $v_{o, \text{new}}$ depend on R_L ?



3. Midterm Problem 3

Redo Midterm Problem 3.

4. Midterm Problem 4

Redo Midterm Problem 4.

5. Midterm Problem 5

Redo Midterm Problem 5.

6. Midterm Problem 6

Redo Midterm Problem 6.

7. Midterm Problem 7

Redo Midterm Problem 7.

8. Midterm Problem 8

Redo Midterm Problem 8.

9. Midterm Problem 9

Redo Midterm Problem 9.

10. Midterm Problem 10

Redo Midterm Problem 10.

11. Homework process and study group

Who else did you work with on this homework? List names and student ID's. (In case of hw party, you can also just describe the group.) How did you work on this homework?

Working in groups of 3-5 will earn credit for your participation grade.