

ECE 207L - OP AMP CIRCUITS - LAB 7

POSITIVE GAIN OP AMP CIRCUITS

FALL 2003

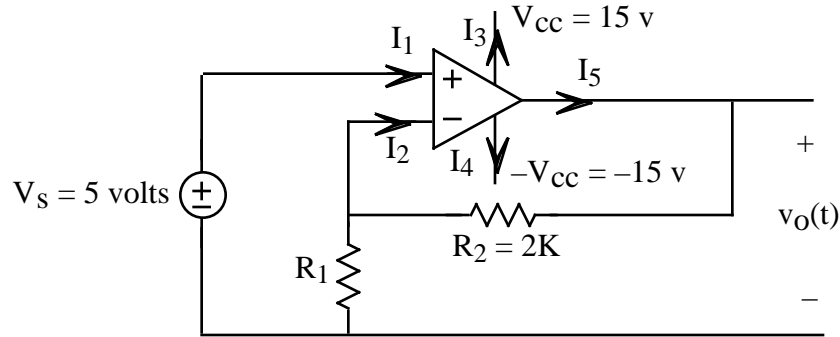
A.P. FELZER

OBJECTIVE

The objective of this lab is to investigate some basic properties of positive gain op amp circuits.

LAB

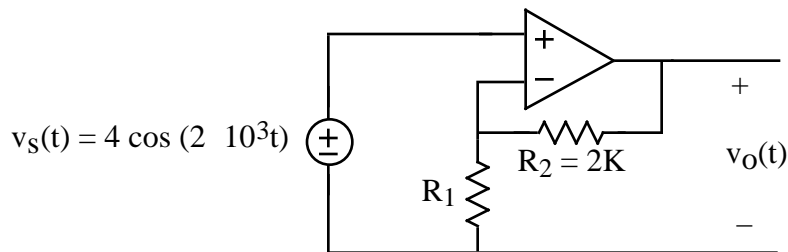
1. Given the following op amp circuit



PARTNER 1: $R_1 = 2K$ PARTNER 2: $R_1 = 4.7K$

- a. First redraw the circuit diagram with op amp pin numbers.
- b. Then measure your resistor values. Compare with nominal values.
- c. Measure $V_+ - V_-$ with a voltmeter. What does your result tell you about whether or not the op amp is operating in its linear active region.
- d. Measure the op amp currents I_1 , I_2 , I_3 , I_4 and I_5 with an ammeter.
- e. Make use of your results in part (d) to verify that KCL is satisfied for the op amp.

2. Given the following positive gain op amp circuit



PARTNER 1: $R_1 = 4.7K$ PARTNER 2: $R_1 = 2K$

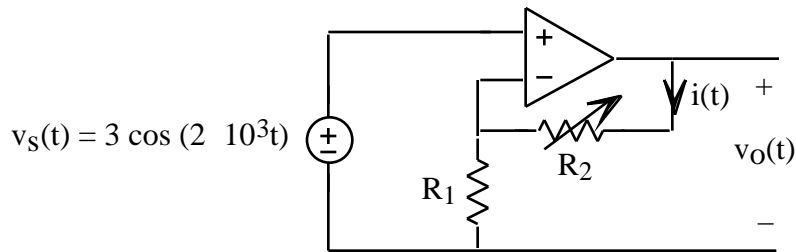
- a. First redraw the circuit diagram with op amp pin numbers
- b. Then measure your resistor values. Compare with nominal values
- c. Measure $v_o(t)$
- d. Make use of the result

$$G = \frac{V_o}{V_s} = \frac{R_1 + R_2}{R_1}$$

to calculate $v_o(t)$

e. Compare your calculated and measured values for $v_O(t)$

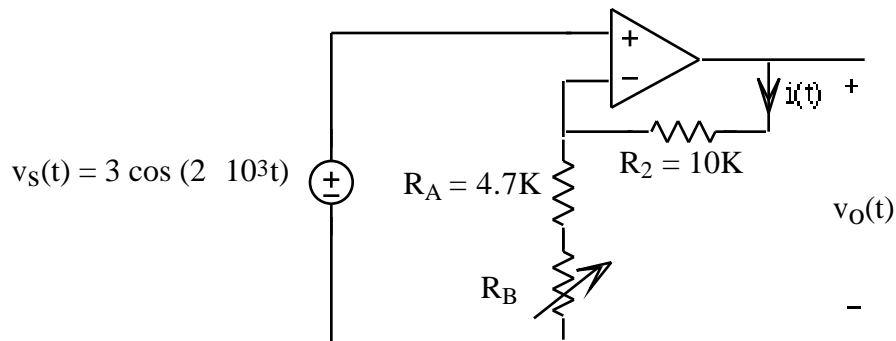
3. Given the following positive gain op amp circuit



PARTNER 1: $R_1 = 4.7\text{K}$ PARTNER 2: $R_1 = 5.7\text{K}$

- First redraw the circuit diagram with op amp pin numbers
- Measure the value of resistor R_1 . Compare with its nominal value
- Observe and describe what happens to the amplitude of $v_O(t)$ as R_2 increases from 0 to 10K. Illustrate with graphs.
- Observe and describe what happens to $i(t)$ as R_2 increases from 0 to 10K. Illustrate with graphs

4. Given the following positive gain op amp circuit



- First redraw the circuit diagram with op amp pin numbers
- Then measure your resistor values. Compare with nominal values
- Observe and describe what happens to the amplitude of $v_O(t)$ as $R_1 = 4.7\text{K} + R_B$ is increased. Illustrate with graphs.
- Observe and describe what happens to $i(t)$ as $R_1 = 4.7\text{K} + R_B$ is increased. Illustrate with graphs