EECS 43
Lab Report
Op Amps (I)

Name:_____
Name:_____
TA: _____
Section:_____

Part 1

1. Adjust the potentiometer R2 and describe how does the gain change as the resistance of R2 increase/decrease. Can you get a gain less than 1 by tuning R2? Why or why not? Calculate the theoretical amplifier gain for R2 = $R2_{max}$ and compare it with your measured gain (Vout/Vin).

2. Turn the potentiometer to its maximum value and change the DC offset of the input signal. Explain what happens and draw the input and output waveforms for an offset of 0.1 V, +0.3 V and –0.1 V. (Label your plots)

3. Replace the potentiometer with a 20 kΩ resistor with the offset of +50 mV. Draw the input and output waveform (label your plot). Can you explain this result?

4. Set the input signal to be 1k Hz, 400 mVPP **ramp** signal with a +50 mV offset. Draw the transfer curve of the non-inverting amplifier (label your plot). This should look similar to Figure 4c.

Part 2

5. Adjust the potentiometer R_2 and describe how does the gain change as the resistance of R2 increase/decrease. Calculate the theoretical amplifier gain for R2 = $R2_{max}$ and compare it with your measured gain (Vout/Vin). Draw the input and output waveform (label your plot). How is this amplifier different from the one in Part 1?

6. Replace the potentiometer with a 20 kΩ resistor with the offset of -50 mV. Draw the input and output waveform (label your plot). Can you explain this result?

7. Set the input signal to be 1kHz, 400 mVPP **ram**p signal with a -50 mV offset. Draw the transfer curve of this inverting amplifier

Part 3

8. Let the input signal be a 1 kHz 2.5 VPP with 1.25 V offset (saw tooth wave). Draw the input output waveform.

9. What happens when you adjust the amplitude while fixing the offset? What happens when you adjust the offset while fixing the amplitude? How the duty cycle of the output changes? Why does it behave like this?

10. Measure how close the output voltage gets to the +5 V and Gnd rails.