Homework 3

1.

Calculate the V_{UTP} and V_{LTP} in Figure 1. $V_{out(max)}$ =±10 V.

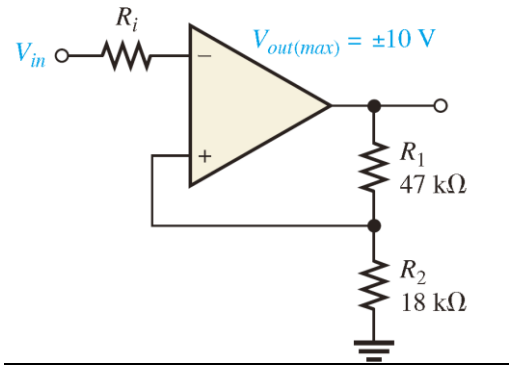

Figure. 1

2.

Draw the output voltage waveform for each circuit in Figure 2 with respect to the input. Show voltage levels.

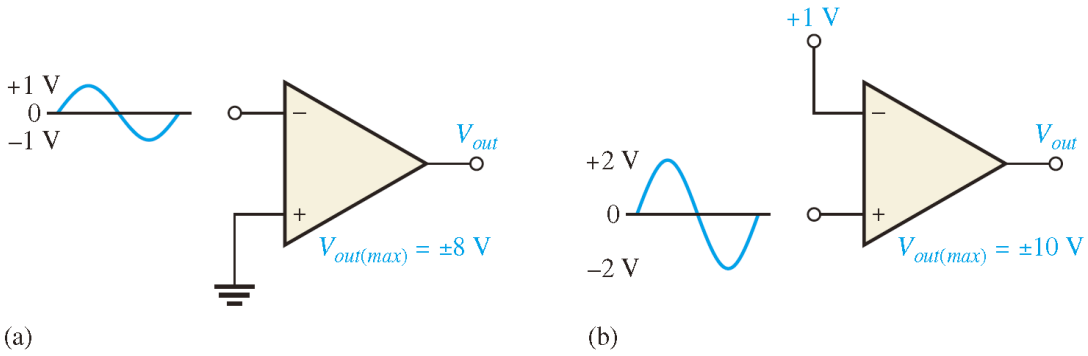

Figure. 2

3.

Determine the output voltage waveform in Figure 3.

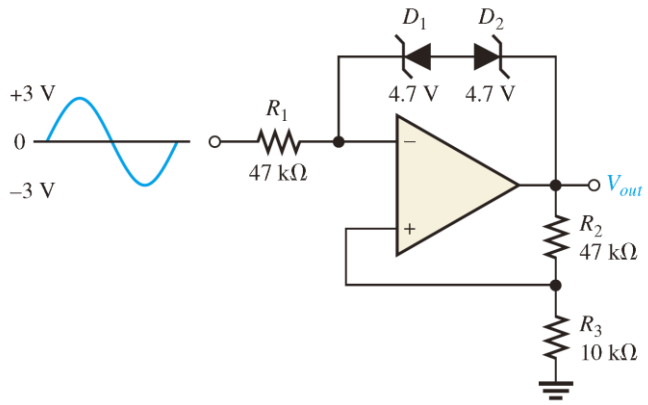

Figure. 3

4.

Refer to Figure 4. Determine the following:

(a) V_{R1} and V_{R2} **(b)** Current through R_f **(c)** V_{OUT}

(d) Find the value of R_f necessary to produce an output that is five times the sum of the inputs.

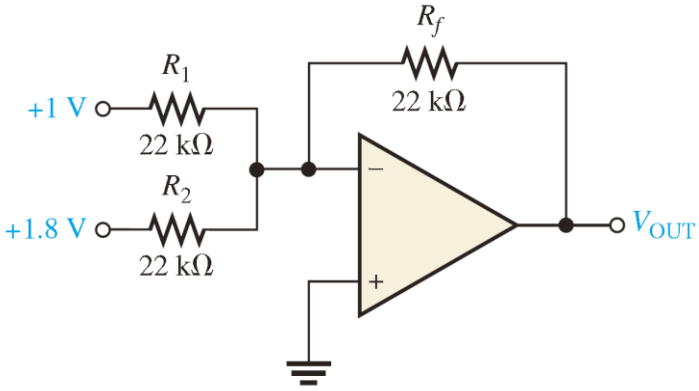

Figure. 4

5.

Find the output voltage when the input voltages shown in Figure 5 are applied to the scaling adder. What is the current through *Rf*?

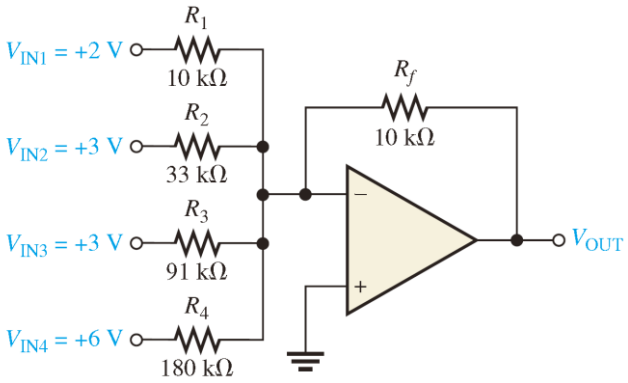

Figure. 5

6.

A triangular waveform is applied to the input of the circuit in Figure 6 as shown. Determine what the output should be and sketch its waveform in relation to the input. What is the magnitude of the capacitor current?

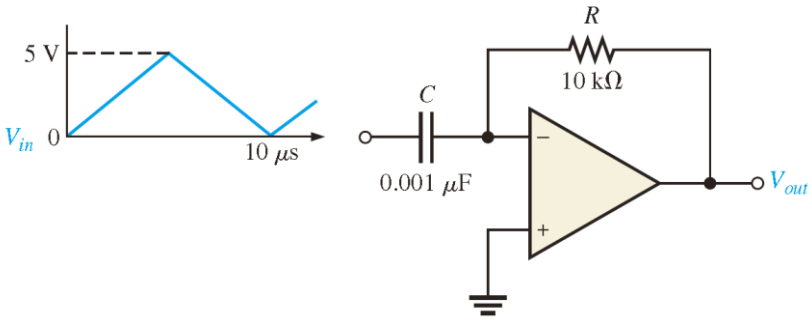

Figure. 6

7.

Beginning in position 1 in Figure 7, the switch is thrown into position 2 and held there for 10 ms, then back to position 1 for 10 ms, and so forth. Sketch the resulting output waveform if its initial value is 0 V. The saturated output levels of the op-amp are ±12 V.

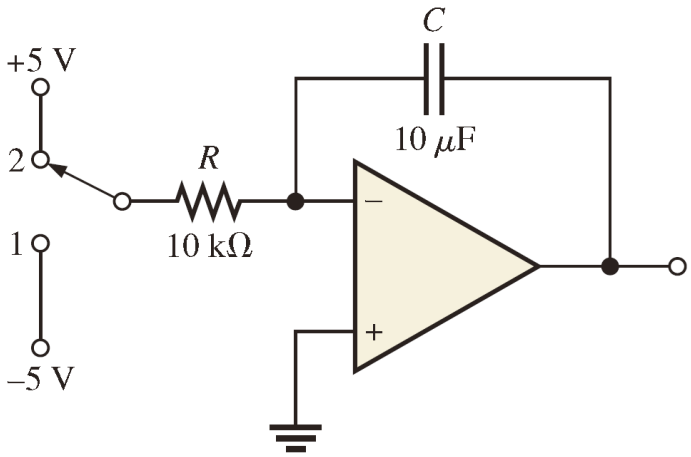

Figure. 7

8.

For the filter in Figure 8, **(a)** how would you increase the critical frequency? **(b)** How would you increase the gain?

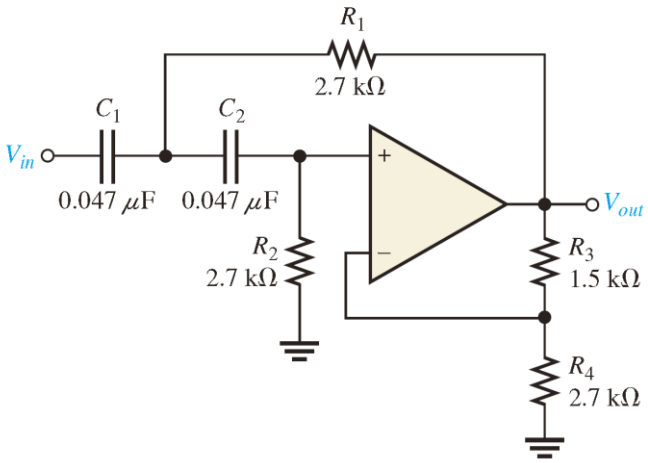

Figure. 8

9.

(1) Determine the center frequency and bandwidth for each filter in Figure 9.

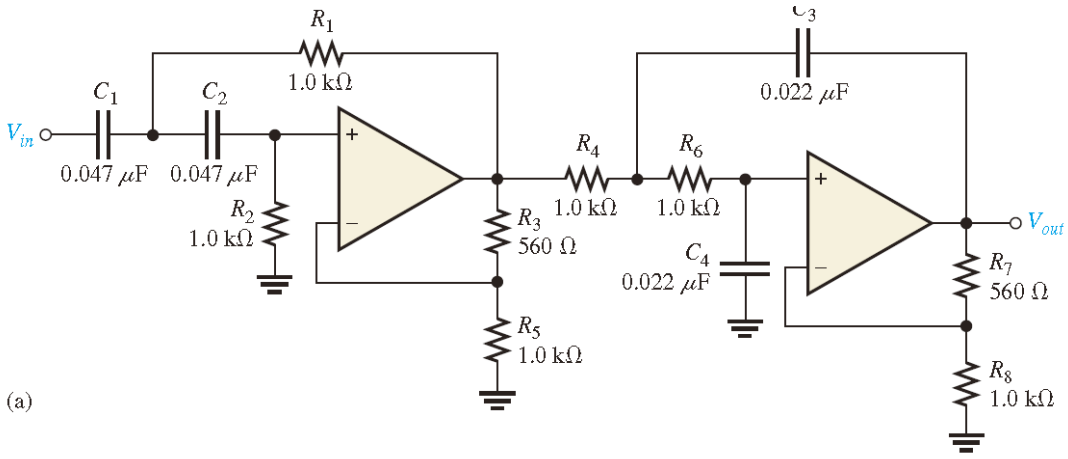

Figure. 9