LSS1 Examples Sheet 1

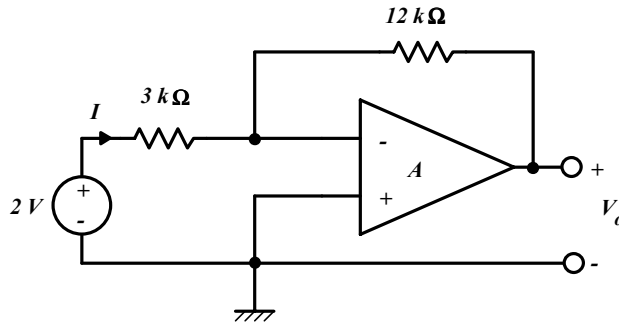1. Figure 1 shows a circuit using an operational amplifier. Determine I and V_o.

Figure 1

2. Using an ideal operational amplifier and two resistors only, design an inverting amplifier circuit with a gain of 6 and input impedance of 15 kΩ.

3. Figure 2 shows a circuit using an ideal operational amplifier. If it is required that $V_o = 2V_1 + 5V_2$, determine suitable values for R_1, R_2 and R_3.
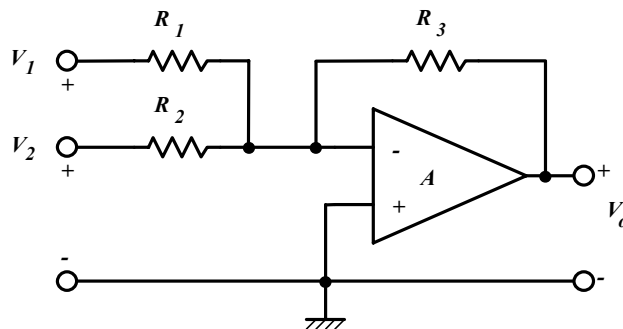

Figure 2

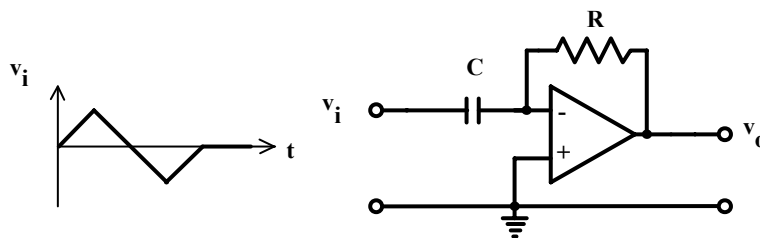4. For the circuit and input signal shown in figure 1, sketch the shape of the output waveform.

Figure 3

5. For the integrator circuit, determine suitable values for R and C if $\tau = 1$ mS.

6. An amplifier has the following frequency response function:
$$G(\omega) = \frac{10}{1 + j\omega/200}$$
    Calculate the gain and phase shift of this circuit at a frequency of 100 rad/s.