



General Sir John Kotelawala Defense University

Basic Electronics

Tutorial 4 – Op Amps

Question 1

A 741 op amp has an open-loop voltage gain of 2×10^5 , input resistance of $2 \text{ M}\Omega$, and output resistance of 50Ω . The op amp is used in the circuit shown in Figure 1. Find the closed-loop gain v_o/v_s . Find i_o when $v_s = 1 \text{ V}$.

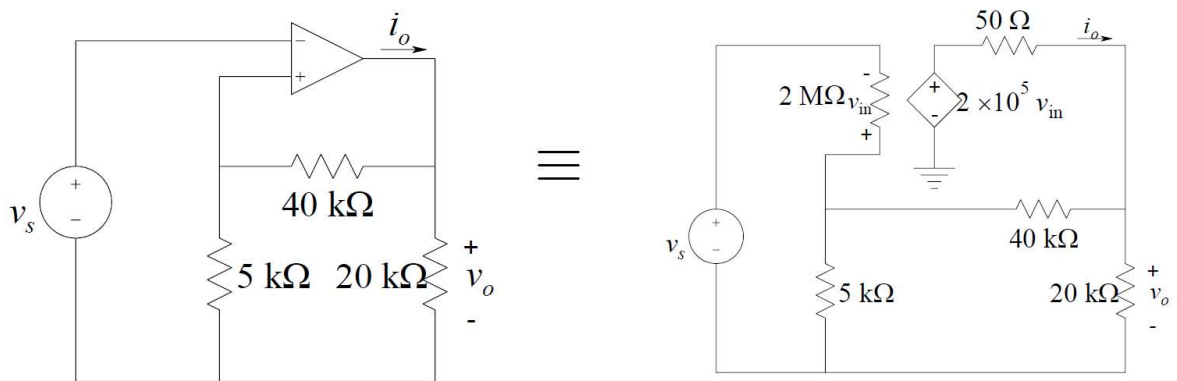


Figure 1

Question 2

Determine the output resistance of an OpAmp voltage follower given in Figure 2-1. (Hint use the circuit given in Figure 2-2 to find R_{out})

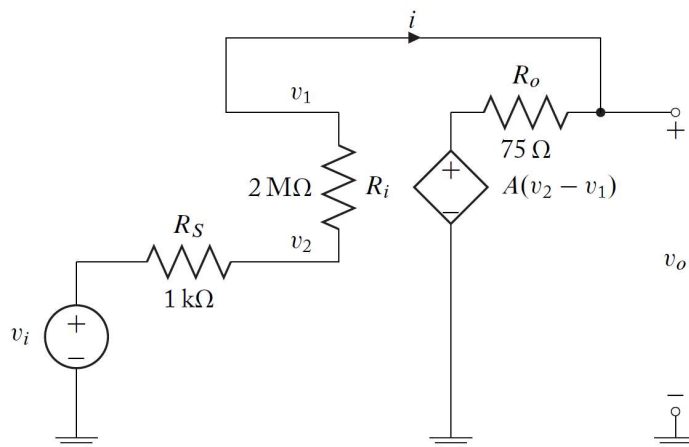


Figure 2-1



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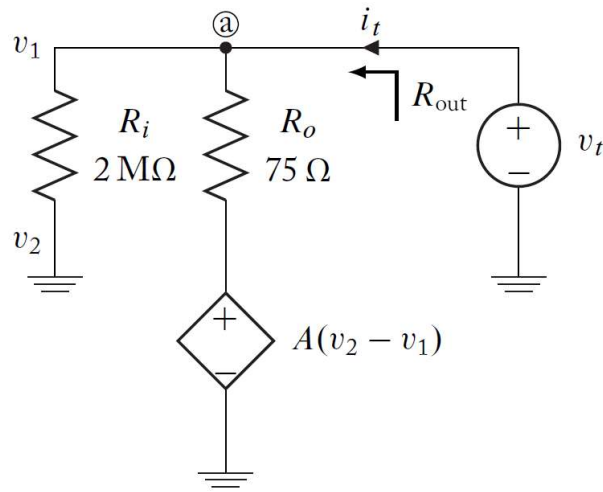


Figure 2-2

Question 3

For the circuit shown in Figure 3, find the gain and i_o . If $v_i = 2 \sin \omega_0 t$ V, what is the output?

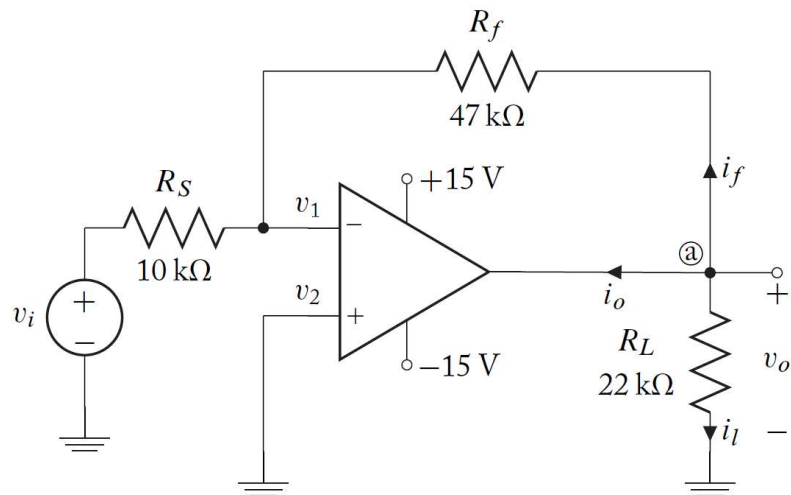


Figure 3



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Question 4

The difference amplifier in Figure 4 has an input voltage $v_a = 3$ V. What values of v_b will result in operation in the linear region?

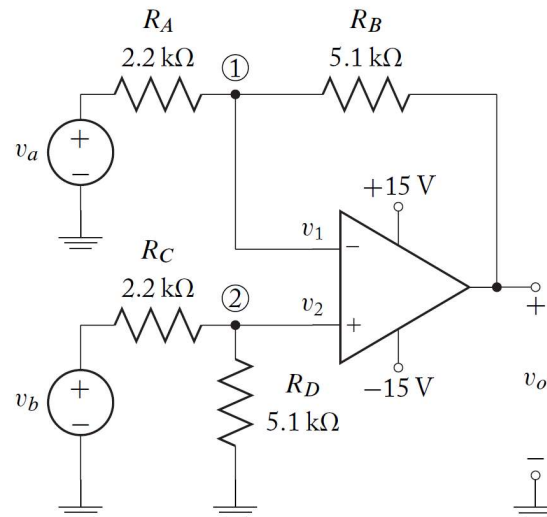


Figure 4