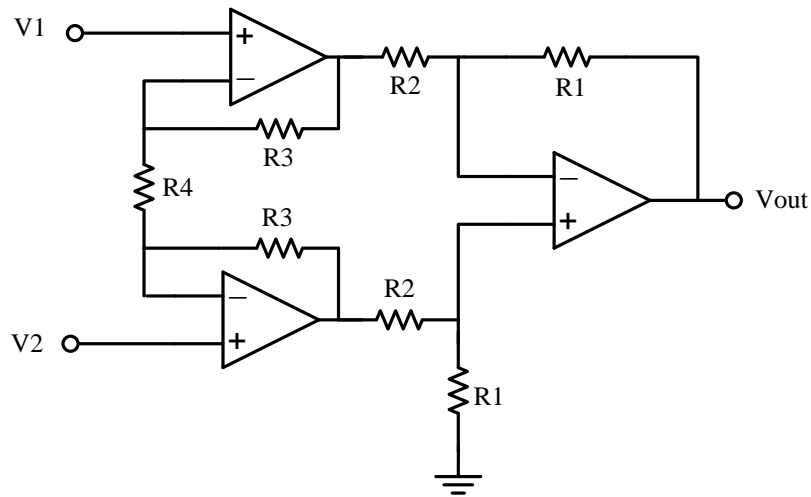
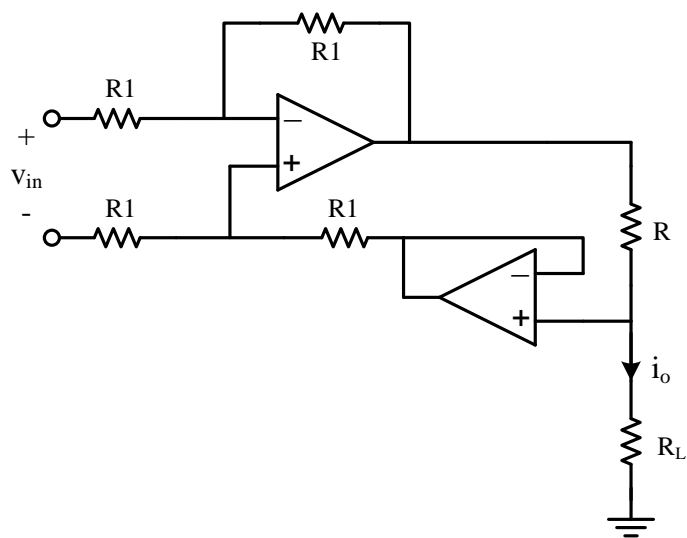


Electronics 2, Assignment #9, Operational Amplifiers.

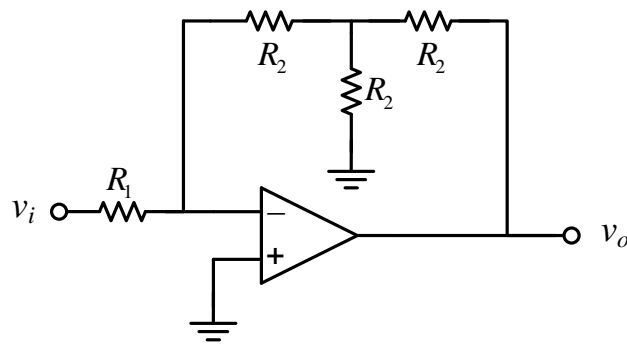
- 1- The configuration shown below is known as the “Instrumentation Amplifier” or “IA”. Determine the output voltage in terms of the input voltages. How much is the input resistance seen from the input terminals (V1 and V2). Assume ideal op-amps.



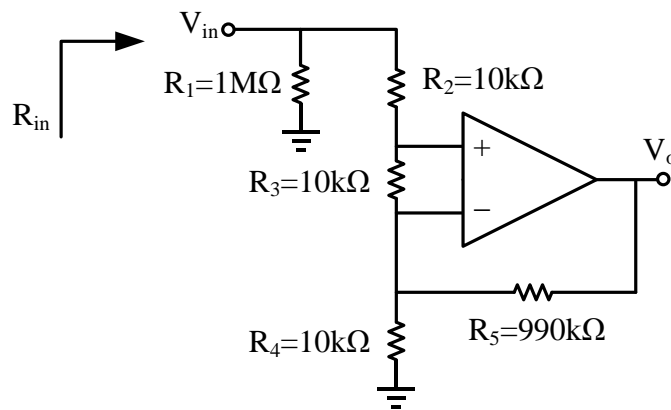
- 2- Calculate the output current ( $i_o$ ) in the following circuit. The op-amps are supposed to be ideal one.



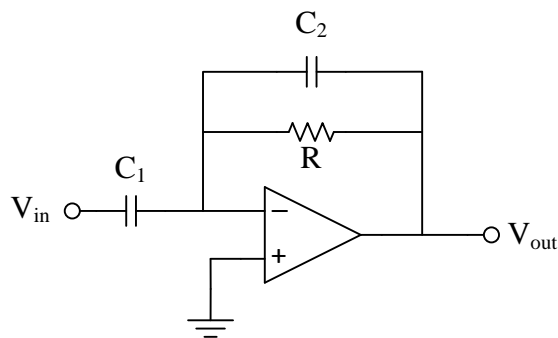
- 3- Determine the voltage gain  $\frac{v_o}{v_i}$  in the following circuit. Assume that the op-amp is ideal.



- 4- Calculate the input resistance and the voltage gain of the following structure. The op-amp is ideal.



- 5- Determine the transfer function of the following circuit and prove that it acts like a filtering circuit. Specify the type of the filter. Assume ideal op-amp.



- 6- Design a circuit which its output voltage is according to the following relation.  $V_1$  and  $V_2$  are the input voltages.

$$V_{out} = 4 \times V_1 + 3 \times V_2$$

7- Design a circuit which solves the following differential equation.

$$\frac{d^2 v}{dt^2} = -20 \frac{dv}{dt} - 100 v + 25 V$$

Good Luck- M.R. Ashraf