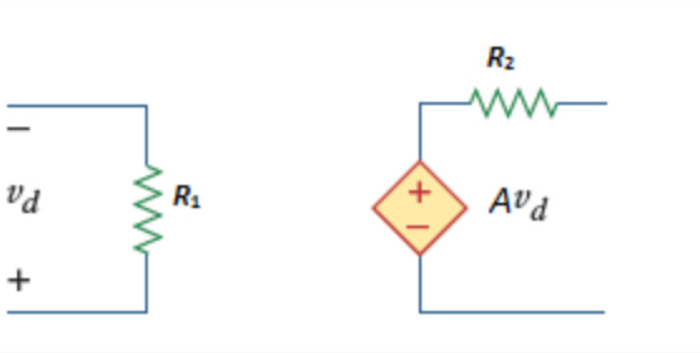
1.

value:
10.00 points

The equivalent model of a certain op amp is shown in the figure given below, where $R_1 = 2.9\ \text{M}\Omega$, $R_2 = 35\ \Omega$, and $A = 16 \times 10^4$.



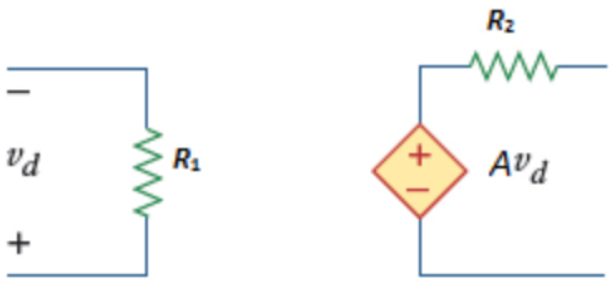
Calculate the input resistance of the given circuit.

The input resistance of the circuit is _____ MΩ.

2.

value:
10.00 points

The equivalent model of a certain op amp is shown in the figure given below, where $R_1 = 2.9\ \text{M}\Omega$, $R_2 = 35\ \Omega$, and $A = 16 \times 10^4$.



Calculate the output resistance of the given circuit.

The output resistance of the given circuit is _____ Ω.

3. value:
10.00 points

The open-loop gain of an op amp is 100000. Calculate the output voltage when there are inputs of +10 μV on the inverting terminal and +20 μV on the noninverting terminal.

The output voltage is _____ mV.

4. value:
10.00 points

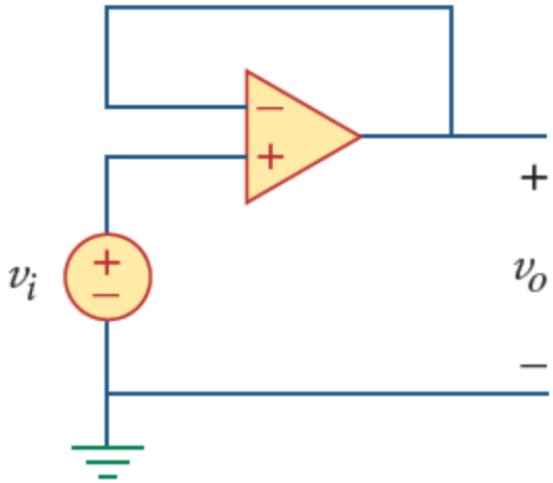
The output voltage of an op amp is -5 V when the noninverting input is 1 mV. If the open-loop gain of the op amp is 2×10^6, what is the inverting input?

The inverting input of the op amp is _____ mV.

5.

value:
10.00 points

For the op amp circuit given below, the op amp has an open-loop gain of 90000, an input resistance of 9 kΩ, and an output resistance of 110 Ω. Find the voltage gain v_0/v_i using the nonideal model of the op amp.

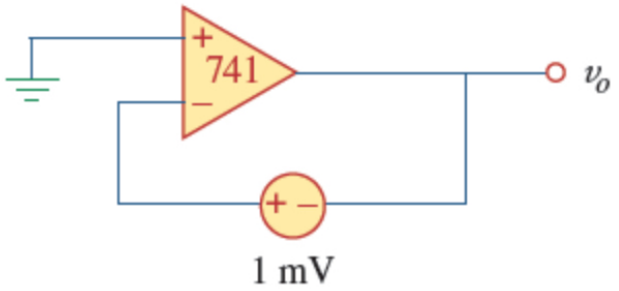


The voltage gain v_0/v_i of the op amp is _____.

6.

value:
10.00 points

A 741 op amp shown in the circuit given below has an open-loop voltage gain of 10000, an input resistance of 2 MΩ, and an output resistance of 145 Ω. Calculate the output voltage v_0 in the op amp circuit.

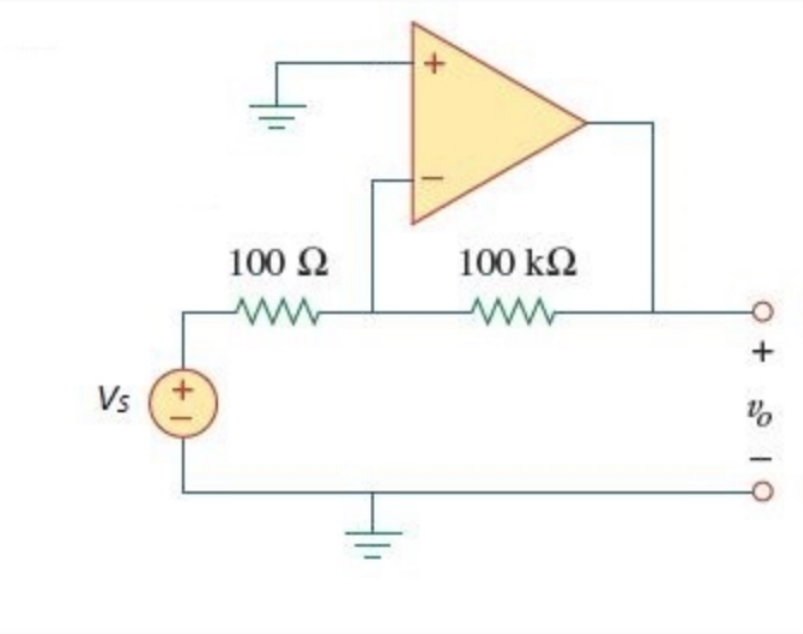


The output voltage of the op amp is _____ mV.

7.

value:
10.00 points

The op amp in the circuit given below has $R_i = 100$ kΩ, $R_0 = 100$ Ω, $v_S = 3$ mV, and $A = 100{,}000$.



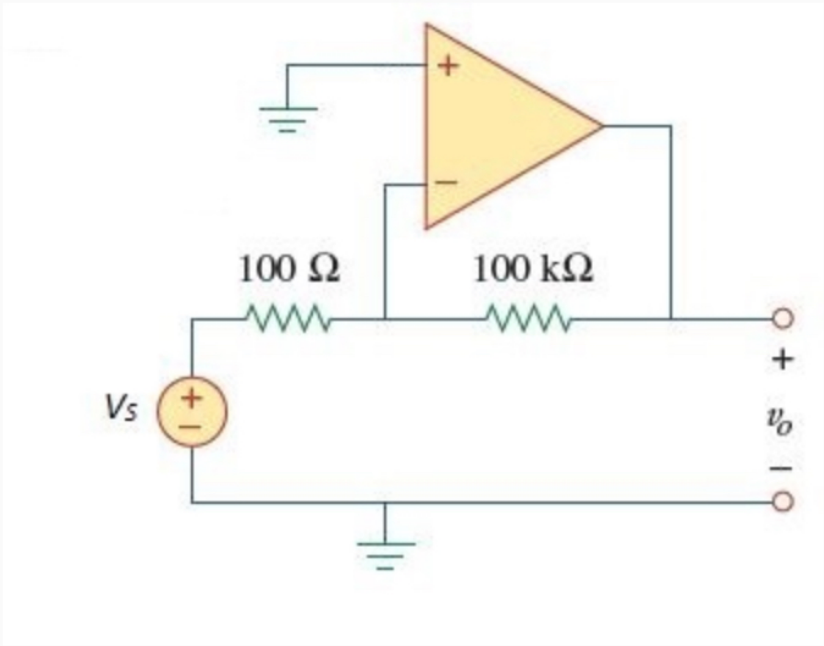
Calculate the output voltage v_o for the given op amp circuit.

The output voltage v_o for the given op amp circuit is _____ mV.

8.

value:
10.00 points

The op amp in the circuit given below has $R_i = 100$ kΩ, $R_0 = 100$ Ω, $v_S = 2$ mV, and $A = 100{,}000$.



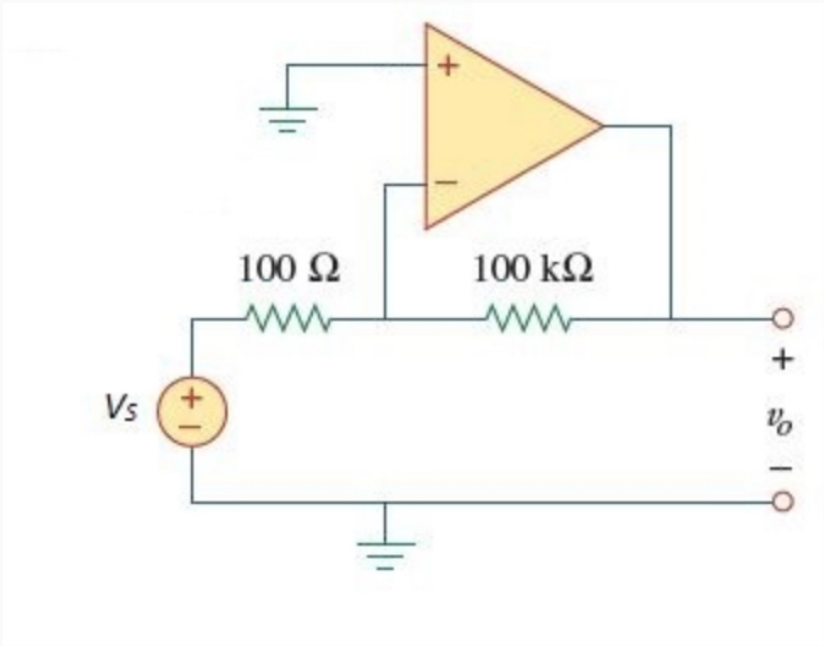
Calculate the differential voltage v_d.

The differential voltage v_d is _____ nV.

9.

value:
10.00 points

The op amp in the circuit given below has $R_i = 100$ kΩ, $R_0 = 100$ Ω, $v_S = 2$ mV, and $A = 100{,}000$.

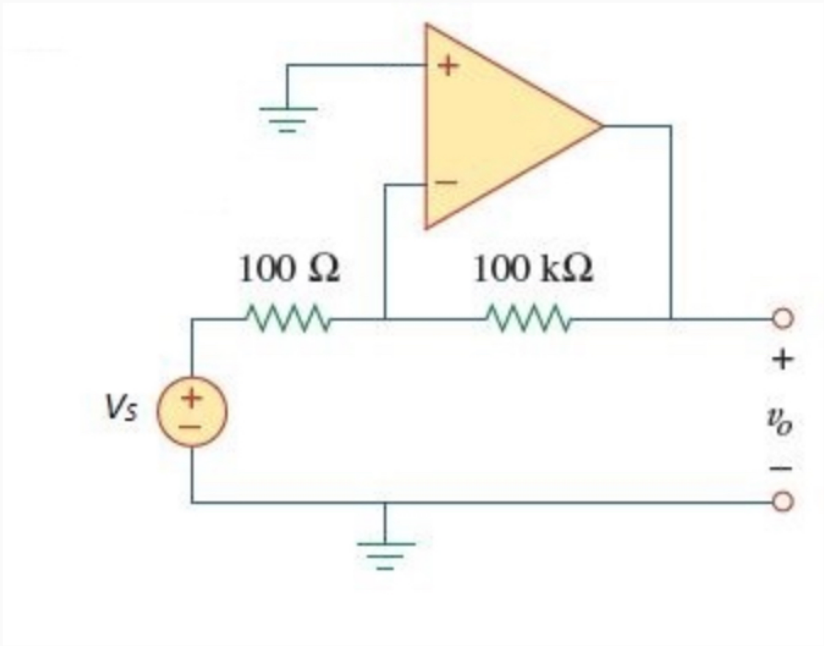


Calculate the output voltage v_o for the given op amp circuit.

The output voltage v_o for the given op amp circuit is _____ mV.

10. value:
10.00 points

The op amp in the circuit given below has $R_i = 100$ kΩ, $R_0 = 100$ Ω, $v_S = 2$ mV, and $A = 100{,}000$.

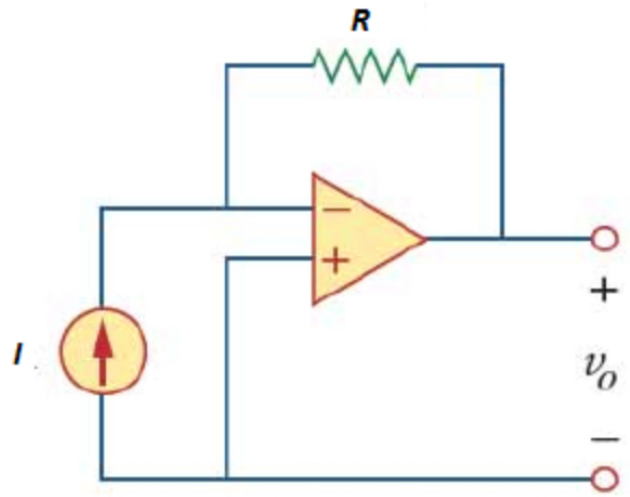


Calculate the differential voltage v_d.

The differential voltage v_d is _____ nV.

11. value:
10.00 points

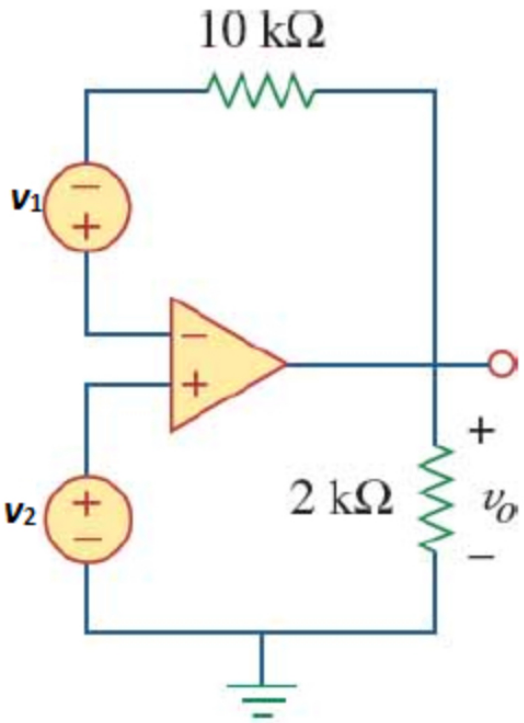
Calculate the output voltage v_o for the op amp circuit given below, where I = 1 mA and R = 12 kΩ. (Assume ideal op amp)



The output voltage v_o for the given op amp circuit is _____ V.

12. value:
10.00 points

Calculate the output voltage of the op amp circuit given below, where v_1 = 2.3 V and v_2 = 1.0 V.

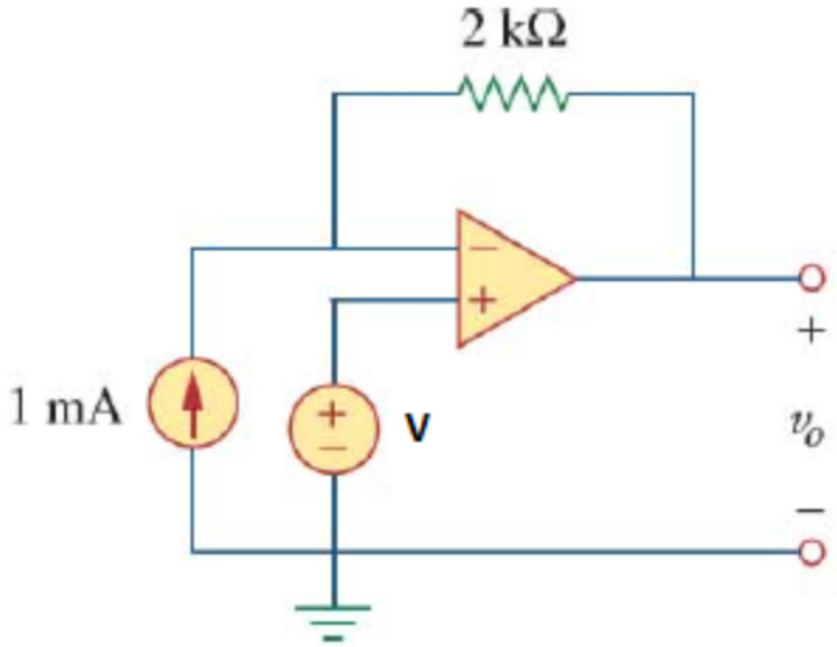


The output voltage of the op amp circuit is _____ V.

13.

value:
10.00 points

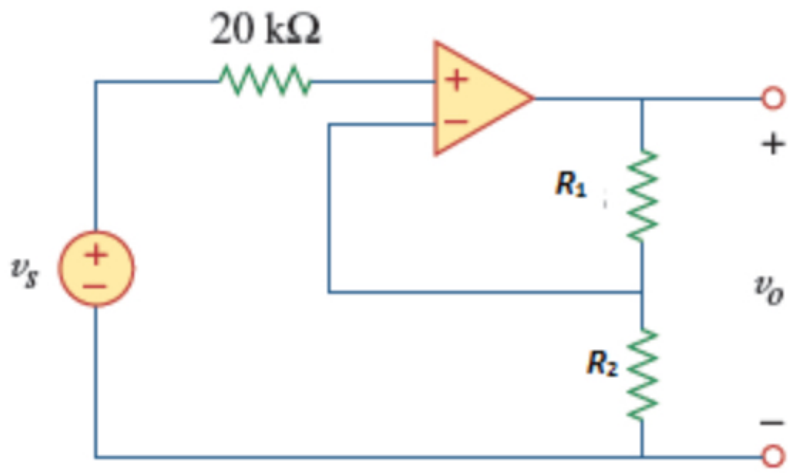
Find the output voltage v_o for the op amp circuit given below, where $V = 7$ V.



The output voltage v_o for the given op amp circuit is _____ V.

14. value:
10.00 points

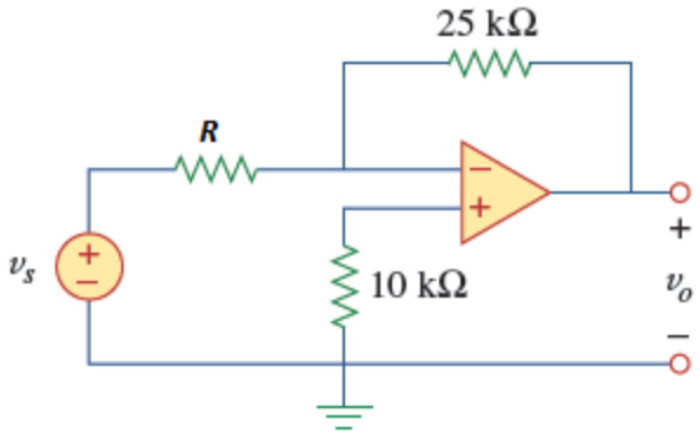
Find the voltage gain v_0/v_s of the circuit given below, where R_1 = 18 kΩ and R_2 = 15 kΩ.



The voltage gain v_0/v_s of the circuit is _____.

15. value:
10.00 points

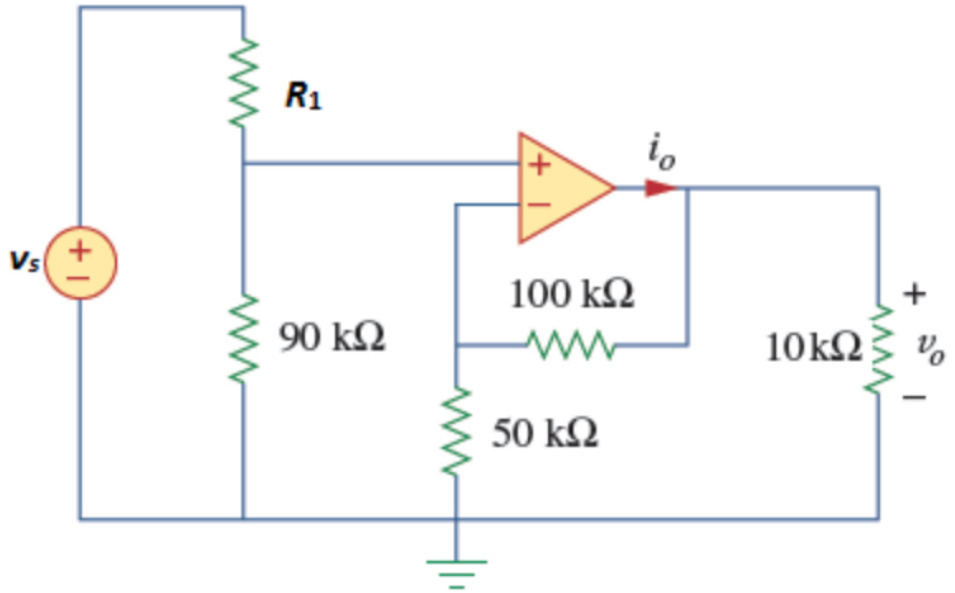
Calculate the voltage ratio v_0/v_s for the op amp circuit given below, where R = 5 kΩ. Assume that the op amp is ideal.



The voltage ratio v_0/v_s for the op amp circuit is _____.

16. value:
10.00 points

Consider the op amp circuit given below, where $R_1 = 16\ k\Omega$ and $v_s = 1\ V$.

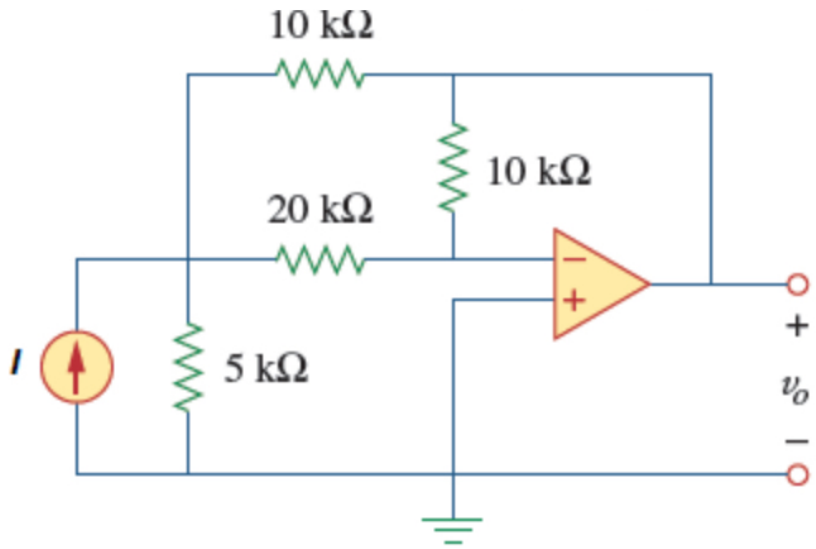


Calculate the output voltage v_0 for the given circuit.

The output voltage v_o is _____ V.

17.

value:
10.00 points

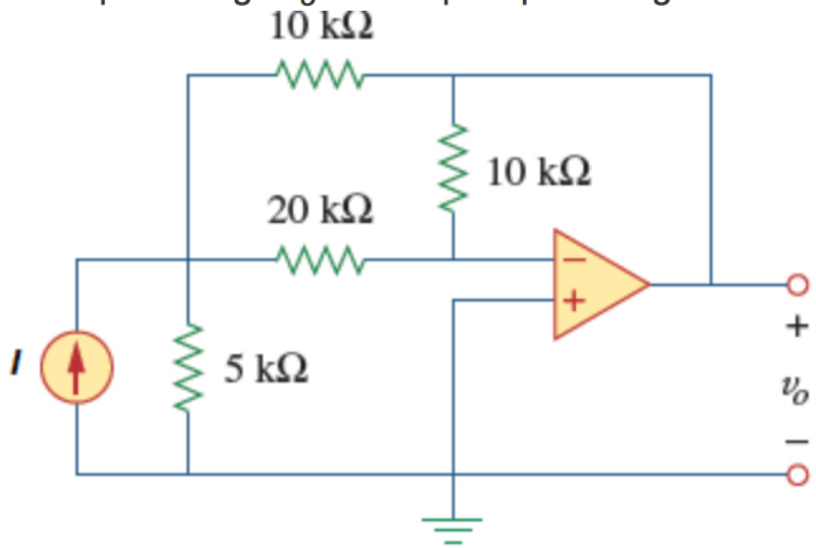


Calculate the output current in the circuit.

The output current in the circuit is _____ μA.

18. value:
10.00 points

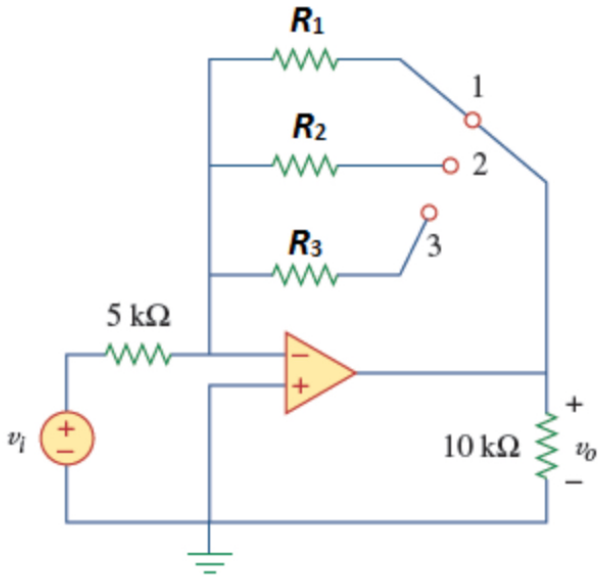
Determine the output voltage v_o in the op amp circuit given below, where I = 4 mA.



The output voltage v_o is _____ V.

19. value:
10.00 points

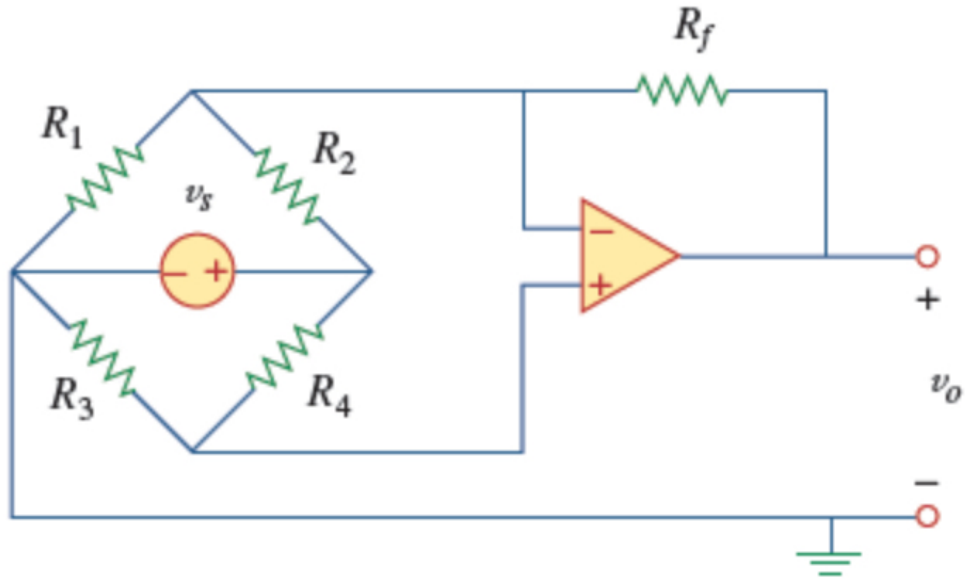
In the circuit given below, R_1 = 20 kΩ, R_2 = 66 kΩ, and R_3 = 3 MΩ. Calculate the gain $\frac{v_0}{v_i}$ when the switch is in position 1, position 2, and position 3.



The gain $\frac{v_0}{v_i}$ at the position 1 is [ ].
The gain $\frac{v_0}{v_i}$ at the position 2 is [ ].
The gain $\frac{v_0}{v_i}$ at the position 3 is [ ].

20. value:
10.00 points

In the circuit given below, find k in the voltage transfer function $v_0 = kv_s$.



- $k = R_F\left[\left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_F}\right)\left(\frac{R_3}{R_3+R_4}\right) - \frac{1}{R_2}\right]$
- $k = \left[\left(\frac{1}{R_1} - \frac{1}{R_2} - \frac{1}{R_F}\right)\left(\frac{R_3}{R_3+R_4}\right) + \frac{1}{R_2}\right]$
- $k = R_f\left(\left(\frac{R_3}{R_1} - \frac{R_3}{R_f} + \frac{R_4}{R_2}\right)\left(\frac{R_3+R_4}{R_3}\right) + \frac{1}{R_2}\right)$
- $k = R_f\left(\left(\frac{R_3}{R_1} + \frac{R_3}{R_f} + \frac{R_4}{R_2}\right)\left(\frac{R_3}{R_3+R_4}\right) - \frac{1}{R_1}\right)$