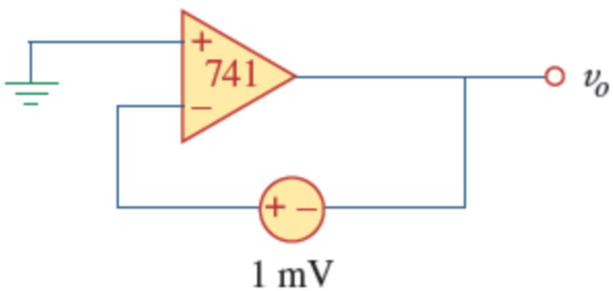
1.

value:
10.00 points

A 741 op amp shown in the circuit given below has an open-loop voltage gain of 80000, an input resistance of 2 MΩ, and an output resistance of 140 Ω. Calculate the output voltage $v_O$ in the op amp circuit.

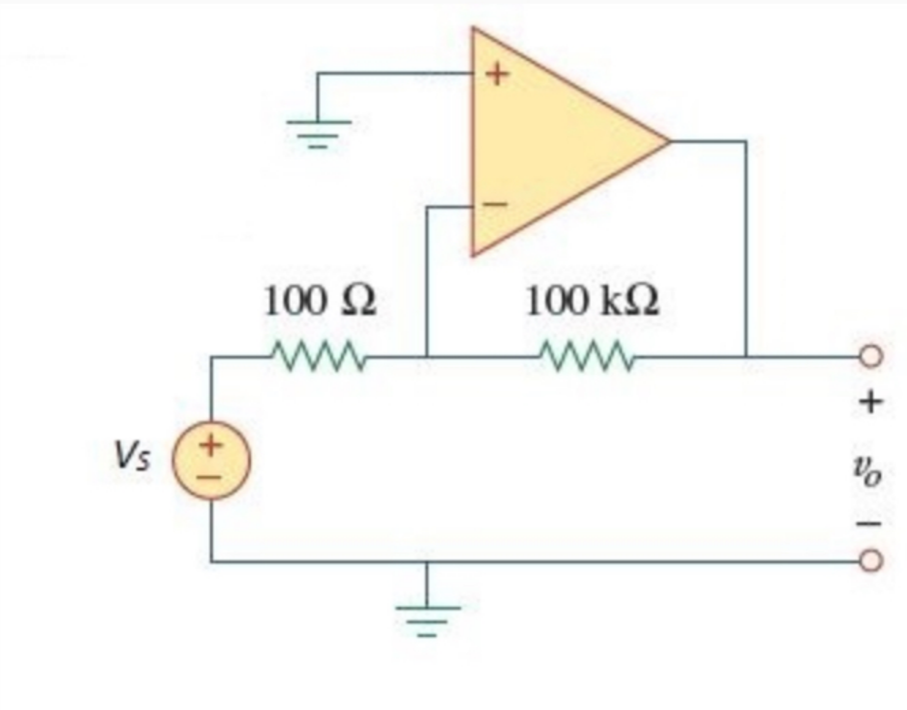



The output voltage of the op amp is ____ mV.

# 2.

value:
10.00 points

The op amp in the circuit given below has $R_i = 100\ \text{k}\Omega$, $R_O = 100\ \Omega$, $v_S = 2$ mV, and $A = 100{,}000$.

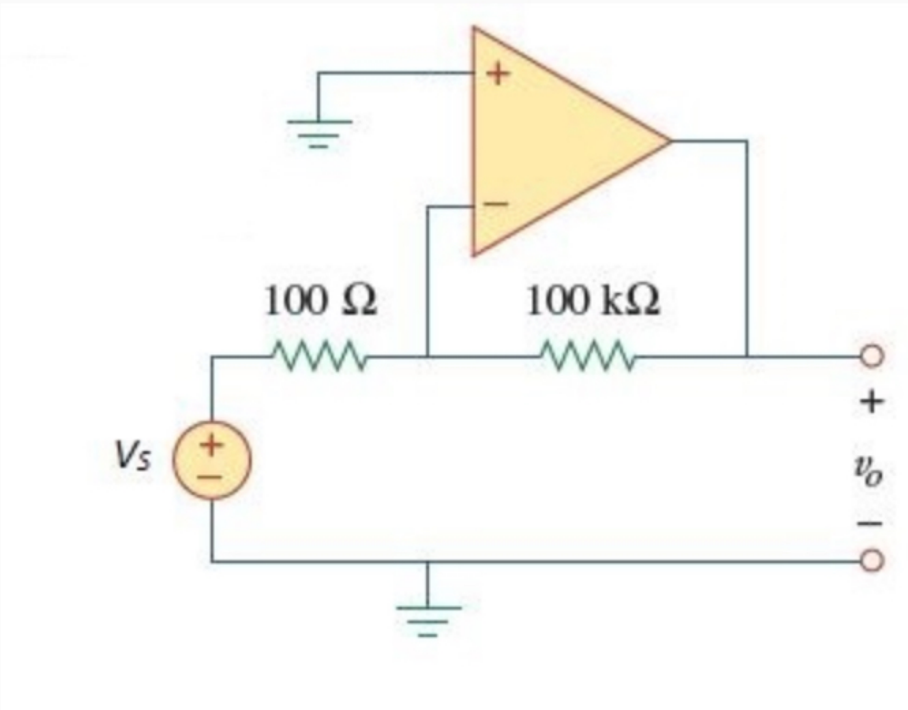



Calculate the output voltage $v_o$ for the given op amp circuit.

The output voltage $v_o$ for the given op amp circuit is [ ] mV.

3. value: 10.00 points

The op amp in the circuit given below has $R_i = 100\ k\Omega$, $R_O = 100\ \Omega$, $v_S = 2$ mV, and $A = 100{,}000$.



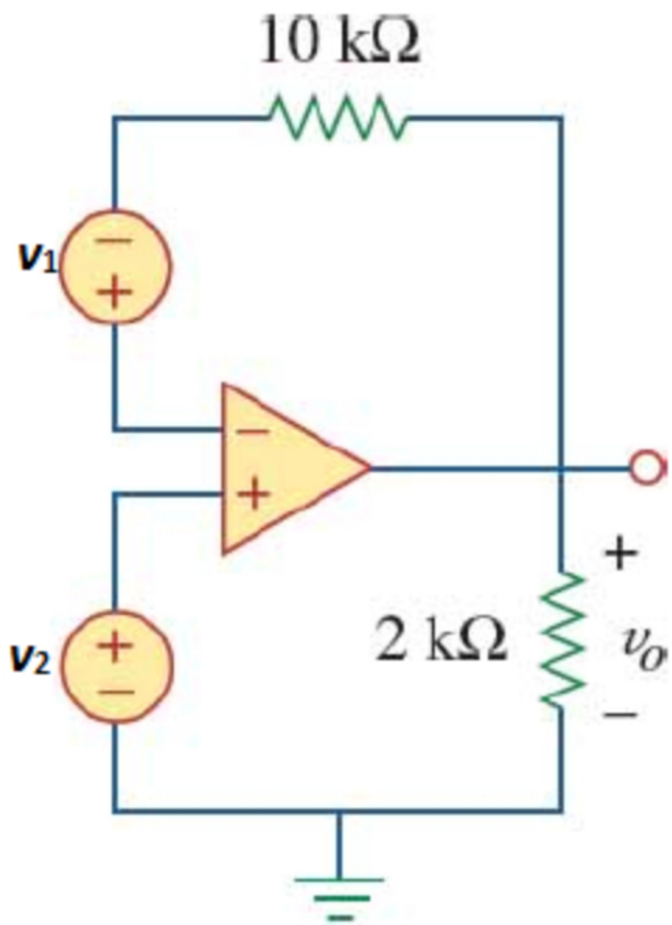

Calculate the differential voltage $v_d$. ($v_d$ = voltage between +ve and –ve input)

The differential voltage $v_d$ is ______ nV.

# 4.

value:
10.00 points

Calculate the output voltage of the op amp circuit given below, where $v_1$ = 2.6 V and $v_2$ = 1.3 V.

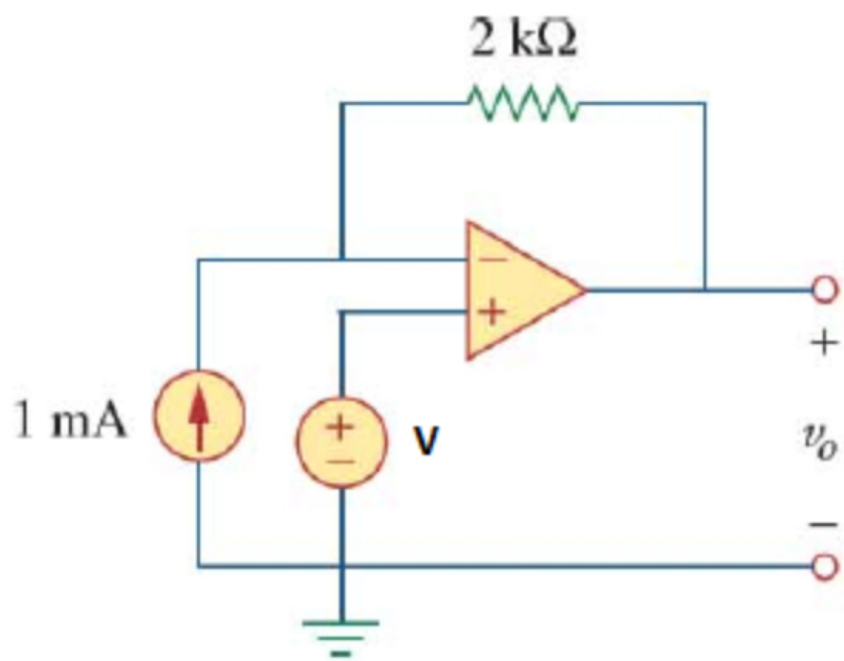



The output voltage of the op amp circuit is ______ V.

5.

value:
10.00 points

Find the output voltage $v_o$ for the op amp circuit given below, where $V$ = 4 V.

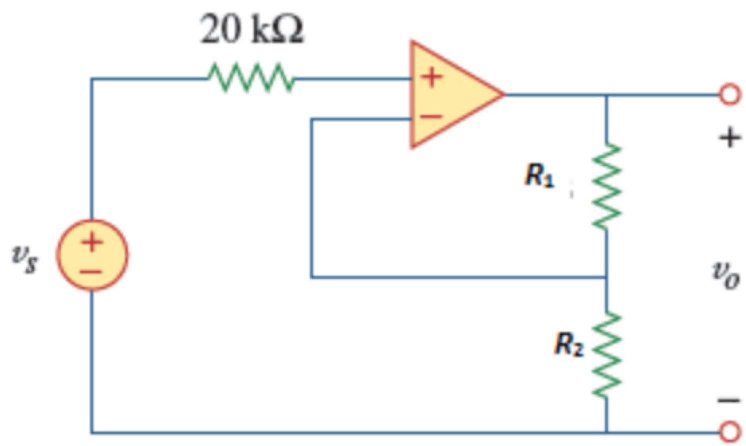



The output voltage $v_o$ for the given op amp circuit is ______ V.

# 6.

value:
10.00 points

Find the voltage gain $v_O/v_S$ of the circuit given below, where $R_1$ = 10 kΩ and $R_2$ = 14 kΩ.

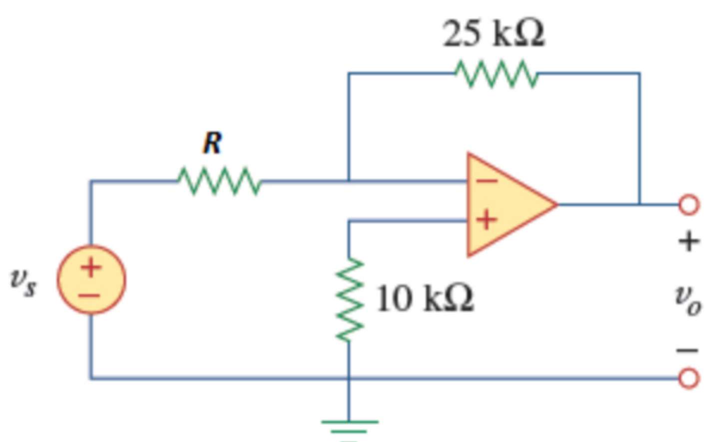



The voltage gain $v_O/v_S$ of the circuit is ______.

7.

value:
10.00 points

Calculate the voltage ratio $v_o/v_s$ for the op amp circuit given below, where $R$ = 12 kΩ. Assume that the op amp is ideal.

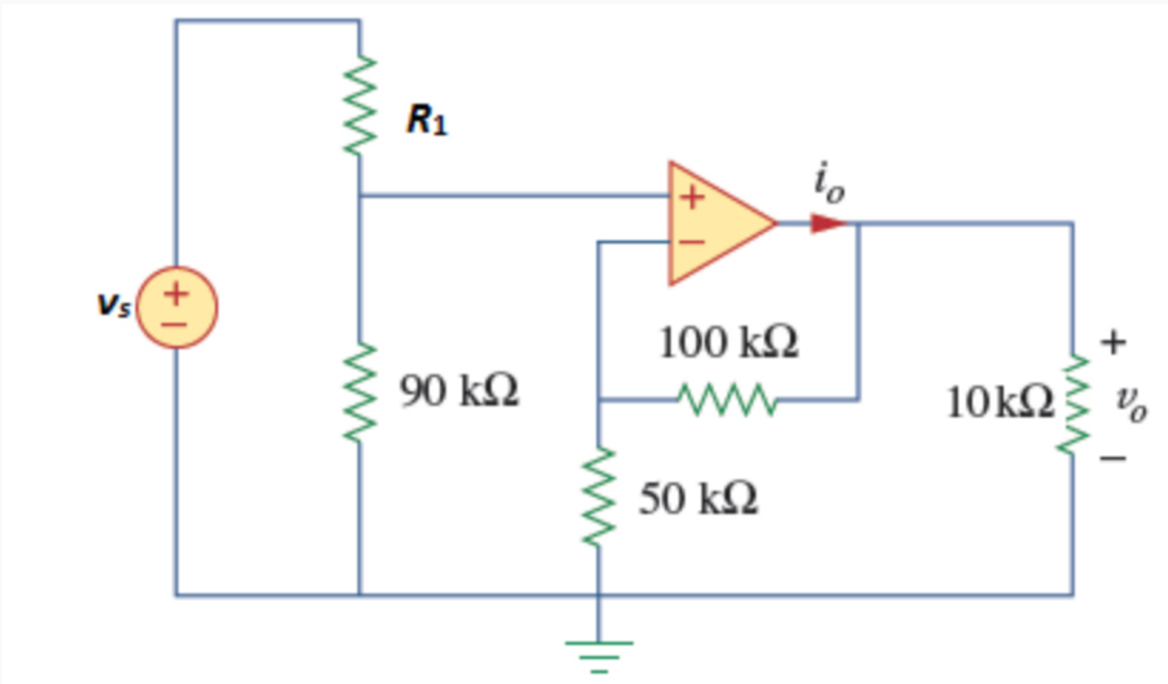



The voltage ratio $v_o/v_s$ for the op amp circuit is ______.

# 8.

value:
10.00 points

Consider the op amp circuit given below, where $R_1$ = 17 kΩ and $v_s$ = 1 V.

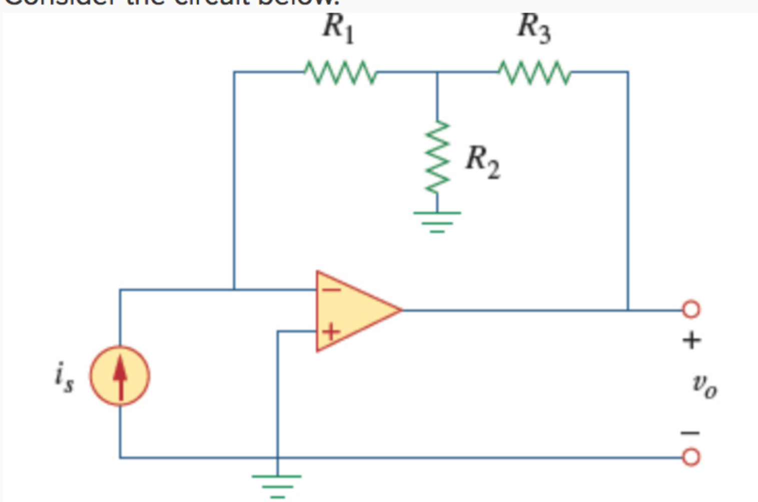



Calculate the output voltage $v_0$ for the given circuit.

The output voltage $v_o$ is [ ] V.

9. value: 10.00 points

Consider the circuit below.



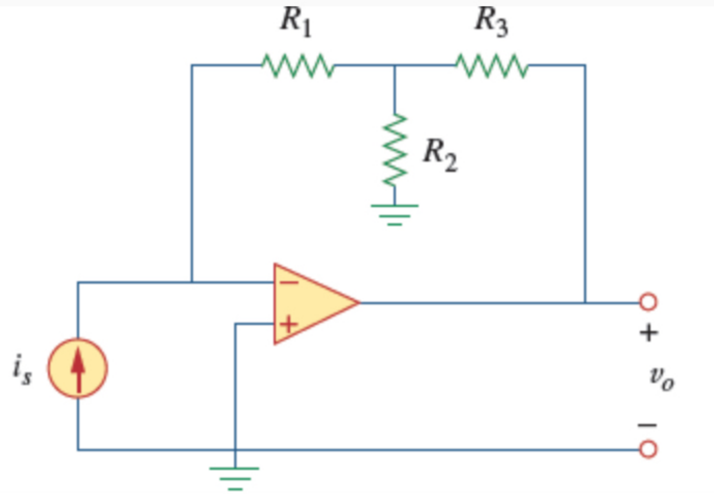

Identify the ratio $\frac{v_0}{i_s}$ in the given op amp circuit.

- $\frac{v_0}{i_s} = -\left(R_1 + R_3 + \frac{R_1 R_3}{R_2}\right)$
- $\frac{v_0}{i_s} = -\left(R_1 + \frac{R_3}{R_1}\right)$
- $\frac{v_0}{i_s} = -\left(R_1 + R_2 + \frac{R_1}{R_2}\right)$
- $\frac{v_0}{i_s} = -\left(R_2 + R_3 + \frac{R_2 R_3}{R_1}\right)$

# 10.

value:
**10.00 points**

Consider the circuit below.



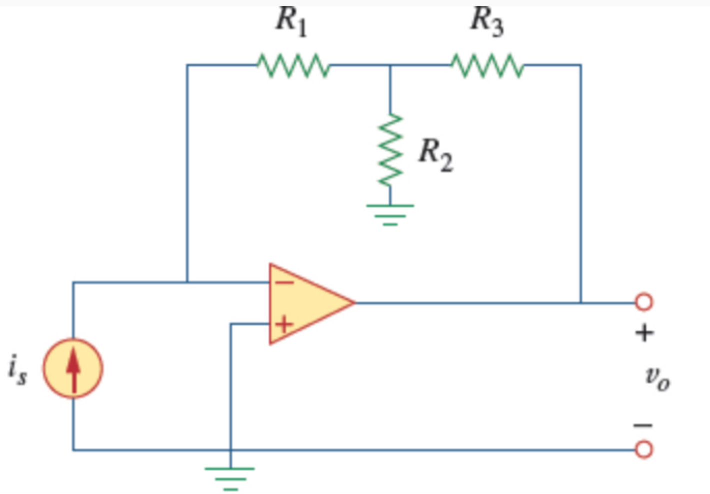

Find the value of the ratio $\frac{v_o}{i_s}$ for $R_1$ = 17 kΩ, $R_2$ = 22 kΩ, and $R_3$ = 36 kΩ.

The value of the ratio $\frac{v_o}{i_s}$ = ______ kΩ.

# 11.

value:
**10.00 points**

Consider the circuit below.

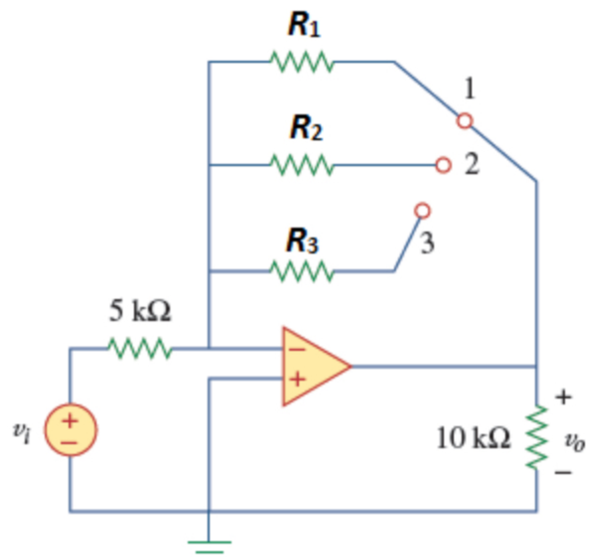



Identify the ratio $\frac{v_0}{i_s}$ in the given op amp circuit.

- $\frac{v_0}{i_s} = -\left(R_1 + R_2 + \frac{R_1}{R_2}\right)$
- $\frac{v_0}{i_s} = -\left(R_1 + R_3 + \frac{R_1 R_3}{R_2}\right)$
- $\frac{v_0}{i_s} = -\left(R_1 + \frac{R_3}{R_1}\right)$
- $\frac{v_0}{i_s} = -\left(R_2 + R_3 + \frac{R_2 R_3}{R_1}\right)$

12. value: 10.00 points

In the circuit given below, $R_1$ = 20 kΩ, $R_2$ = 76 kΩ, and $R_3$ = 12 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 ______.