

2.17 A new instrumentation amplifier circuit has been proposed, as shown in Figure 2.48.

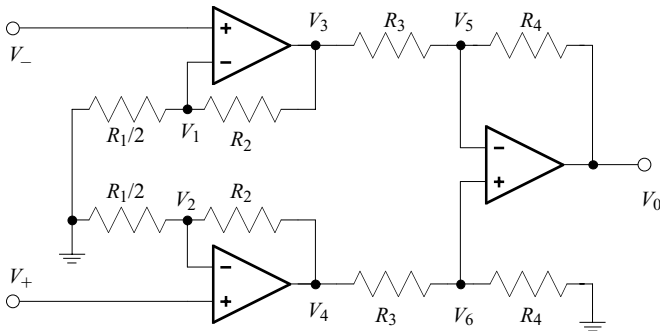


Figure 2.48 Alternative instrumentation amplifier circuit.

Assume:

- $R_1/2 = 50\ \Omega$, $R_2 = 5\ \text{k}\Omega$, $R_3 = 1\ \text{k}\Omega$, $R_4 = 10\ \text{k}\Omega$;
- input $V_+(t) = 1.0\ \text{V} + 1.0\ \text{mV} \sin(\omega t)$;
- input $V_-(t) = 1.0\ \text{V} - 1.0\ \text{mV} \sin(\omega t)$;
- $f = 2\pi\omega = 1\ \text{kHz}$;
- power supply voltages are -10 and $+10\ \text{V}$.

Answer the following:

- What is $V_3(t)$?
- What is $V_4(t)$?
- What is $V_4(t) - V_3(t)$?
- What is $V_0(t)$?
- Is this circuit design better than the one in Problem 2.16? Explain your answer.