

Q1 [Modified from Alexander Fig 5.29]

For the figure shown in Figure 5.29, assuming the op amp is ideal,

- Determine the voltage V_a ;
- Determine the voltage V_c ;
- Hence find i_o .

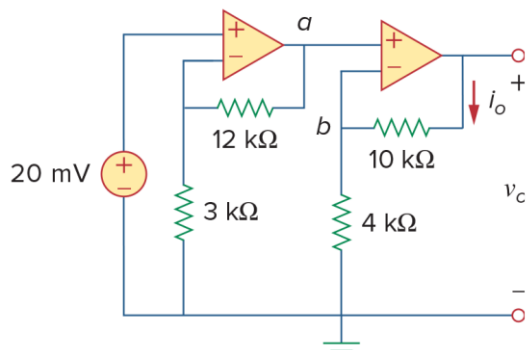


Fig 5.29

Q2 Alexander Figure 5.30

For the figure shown in Figure 5.30, assuming the op amp is ideal,

- Determine v_o .
- Determine i_o .

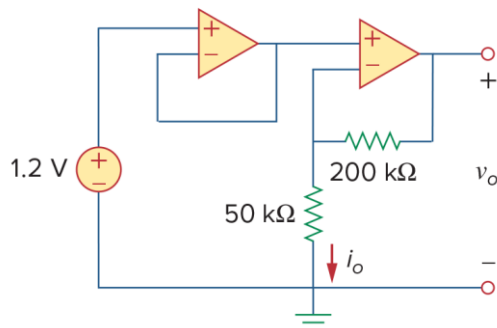


Fig 5.29

Q3 [Modified from Alexander Fig 5.33]

For the circuit shown in Figure 5.33, assuming the op amp is ideal and $v_1 = 7$ V and $v_2 = 3.1$ V,

- Find I_1 , I_2 , and I_3 .
- Determine v_o .

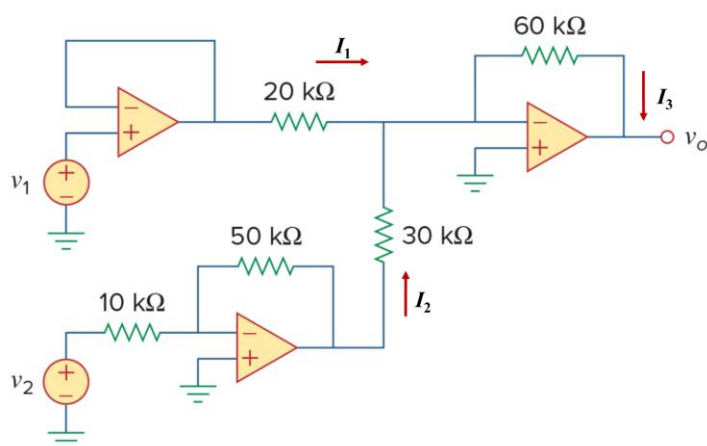


Fig 5.33

Q4 Alexander PP5.12

A three-bit DAC is shown in Figure 5.37.

- Determine $|v_o|$ for $[v_1 v_2 v_3] = [010]$.
- Find $|v_o|$ if $[v_1 v_2 v_3] = [110]$.
- If $|v_o| = 1.25$ V is desired, what should be $[v_1 v_2 v_3]$?
- To get $|v_o| = 1.75$ V, what should be $[v_1 v_2 v_3]$?

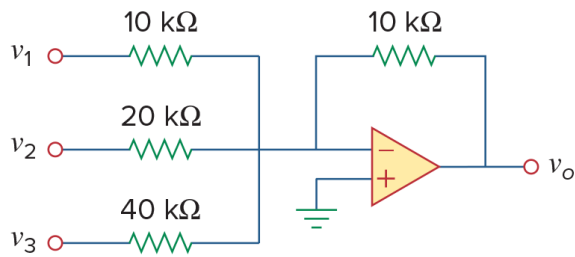


Fig 5.37

Q5 Alexander PP5.13

Determine the value of the external gain-setting resistor R_G required for the instrumentation amplifier in Figure 5.38 to produce a gain of 142 when $R_1 = R_2 = R_3 = 25$ kΩ

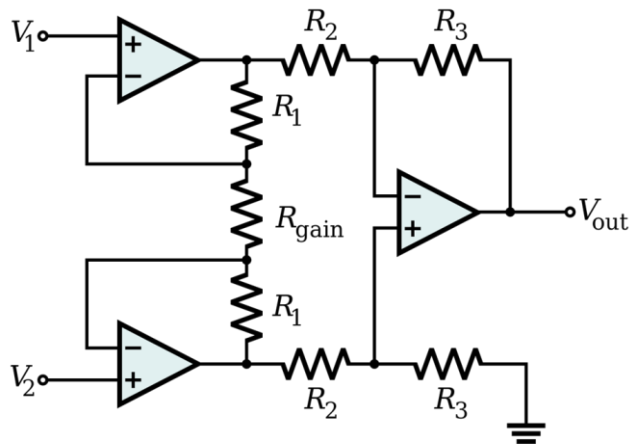


Fig 5.38

Q6

Calculate the CMRR (in dB) for the circuit measurements of $V_{dm} = 1$ mV for $V_o = 120$ mV, and $V_{cm} = 1$ mV, for $V_o = 20$ μV.

Numerical answers**Q1 [Modified from Alexander Fig 5.29]**

- (a) 100 mV
- (b) 350 mV
- (c) 25 μ A

Q2 Alexander Fig. 5.30

- (a) 6 V
- (b) 24 μ A

Q3 [Modified from Alexander Fig 5.33]

- (a) 0.35 mA, -0.52 mA, -0.16 mA
- (b) 10 V

Q4 Alexander PP5.12

- (a) 0.5 V
- (b) 1.5 V
- (c) [101]
- (d) [111]

Q5 Alexander PP5.12354.6 Ω **Q6 Alexander E7.5**

75.56 dB