

Chapter 5, Solution 39

For the op amp circuit in Fig. 5.76, determine the value of v_2 in order to make $v_o = -16.5$ V.

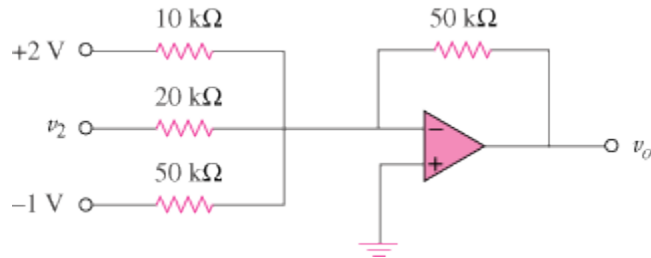


Figure 5.76
For Prob. 5.39.

Solution

This is a summing amplifier.

$$v_o = -\left(\frac{R_f}{R_1}v_1 + \frac{R_f}{R_2}v_2 + \frac{R_f}{R_3}v_3\right) = -\left(\frac{50}{10}(2) + \frac{50}{20}v_2 + \frac{50}{50}(-1)\right) = -9 - 2.5v_2$$

Thus,

$$v_o = -16.5 = -9 - 2.5v_2 \quad \longrightarrow \quad \underline{v_2 = 3 \text{ V}}$$