Chapter 5, Solution 58.

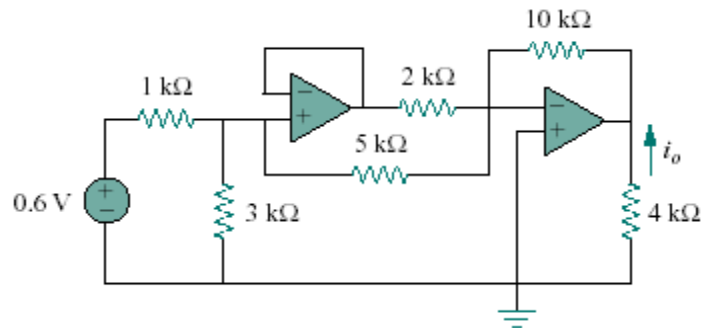Calculate i_o in the op amp circuit of Fig. 5.85.

Figure 5.85
For Prob. 5.58.

Solution

Looking at the circuit, the voltage at the right side of the 5-kΩ resistor must be at 0V if the op amps are working correctly. Thus the 1-kΩ is in series with the parallel combination of the 3-kΩ and the 5-kΩ. By voltage division, the input to the voltage follower is:

$$v_1 = \frac{3\|5}{1+3\|5}(0.6) = 0.3913V$$

= to the output of the first op amp.

Thus,
$$v_o = -10((0.3913/5)+(0.3913/2)) = -2.739 \text{ V}.$$

$$i_o = \frac{0 - v_o}{4k} = \textbf{684.8 µA}.$$