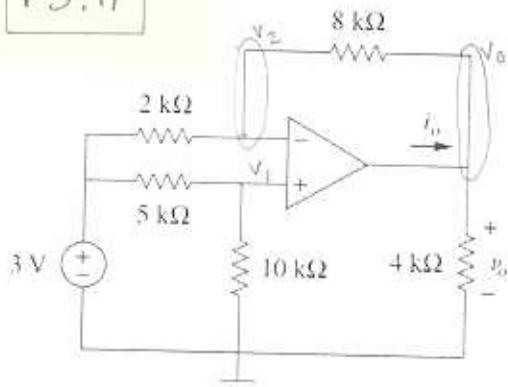


P5.11

Find  $v_o$  and  $i_o$ .

Voltage divider

$$v_1 = \left( \frac{10}{5+10} \right) 3 = 2 \text{ V}$$

$$v_2 = v_1 = 2 \text{ V}$$

$$\text{KCL} \quad \frac{v_2 - 3}{2k} + \frac{v_2 - v_o}{8k} = 0$$

$$\frac{2-3}{2k} + \frac{2-v_o}{8k} = 0$$

$$-v_o = \frac{1}{2k} \cdot 8k - 2$$

$$v_o = -2 \text{ V}$$

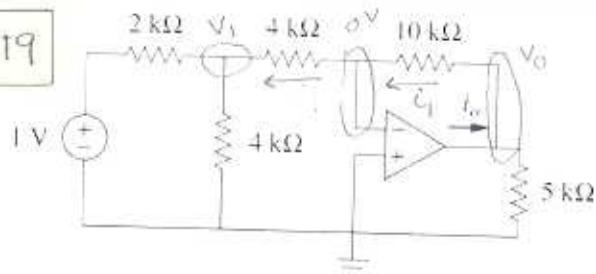
find  $i_o$  (KCL)

$$\frac{v_o}{4k} + \frac{v_o - v_2}{8k} = i_o$$

$$i_o = \frac{-2}{4k} + \frac{-2-2}{8k}$$

$$= -\frac{1}{2} - \frac{1}{2} = -1 \text{ mA}$$

P5.19



KCL

$$\frac{v_1 - 1}{2k} + \frac{v_1}{4k} + \frac{v_1 - 0}{4k} = 0$$

$$2v_1 - 2 + v_1 + v_1 = 0$$

$$4v_1 = 2 \quad v_1 = 1/2 \text{ V}$$

$$i_1 = \frac{0 - v_1}{4k} = -\frac{1/2}{4k} = -125 \text{ mA}$$

$$i_2 = \frac{v_0 - 0}{10k} \Rightarrow v_o = 10k (-125 \text{ mA}) = 1.25 \text{ V}$$

$$\text{KCL} \quad i_o = i_1 + \frac{v_o}{5k}$$

$$= -0.125 + \frac{-1.25 \text{ V}}{5k}$$

$$= -0.125 - 0.250 = -0.375 \text{ A} = -375 \text{ mA}$$