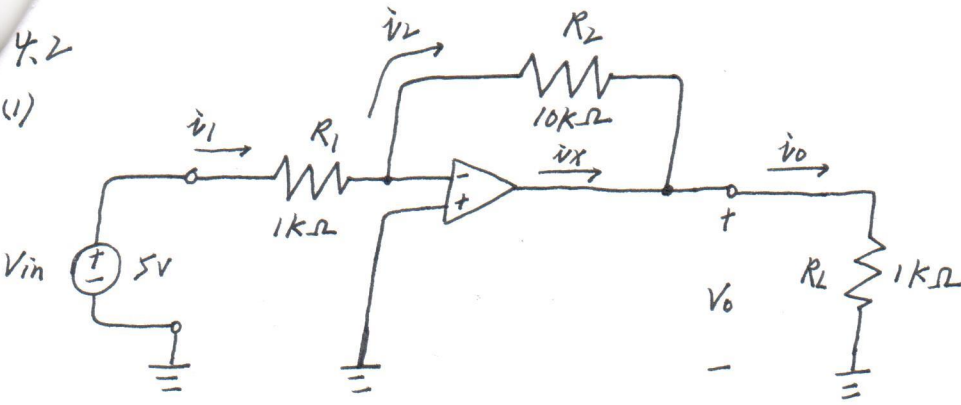


4.2

(1)



First, we verify that negative feedback is present.

According to the summing-point constraint:

$$i_1 = \frac{V_{in}}{R_1} = \frac{5V}{1k\Omega} = 5mA$$

$$i_2 = i_1 = 5mA$$

Writing a voltage equation around the loop that includes the output terminals, the resistor R_2 , and the op-amp input terminals:

$$V_o + R_2 i_2 = 0$$

$$\therefore V_o = -R_2 i_2 = -10k\Omega \cdot 5mA = -50V$$

$$i_o = \frac{V_o}{R_L} = \frac{-50V}{1k\Omega} = -50mA$$

KCL:

$$i_2 + i_x = i_o \Rightarrow i_x = i_o - i_2 = (-50 - 5)mA = -55mA$$