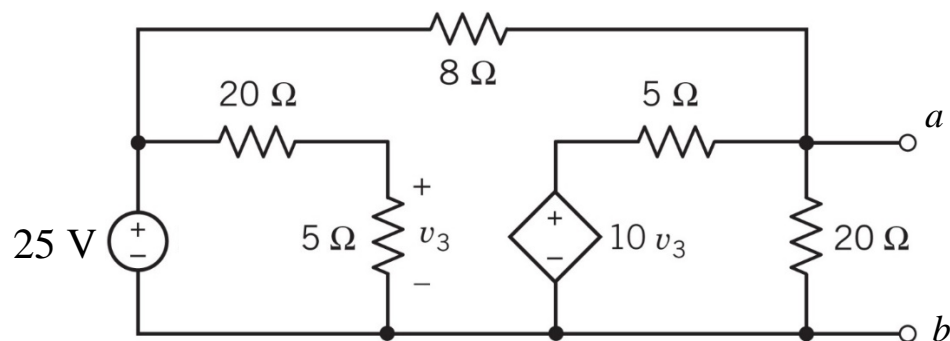


**Question 1A:**

For the circuit shown in **Fig.1**, find  $v_3$  and  $v_{ab}$ .

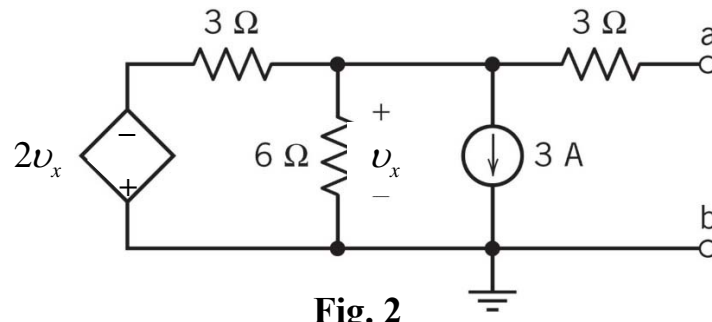


**Fig.1**

**Question 1B:**

In the circuit shown in **Fig. 2**, find

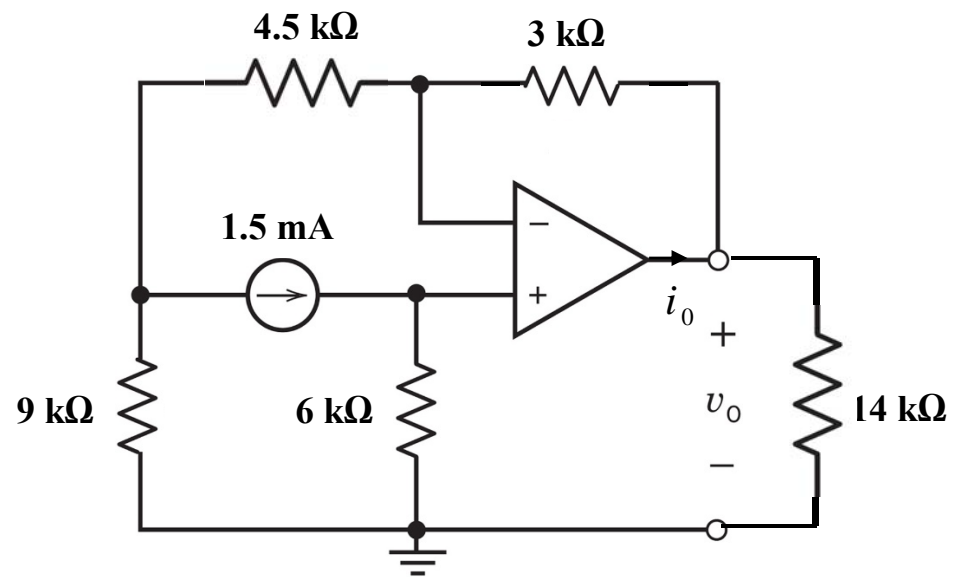
- i) Thevenin voltage  $V_{Th}$  at terminals a and b.
- ii) Thevenin resistance  $R_{Th}$  at terminals a and b.



**Fig. 2**

**Question 2A:**

For the circuit shown in **Fig. 3**, find  $v_o$  and  $i_o$

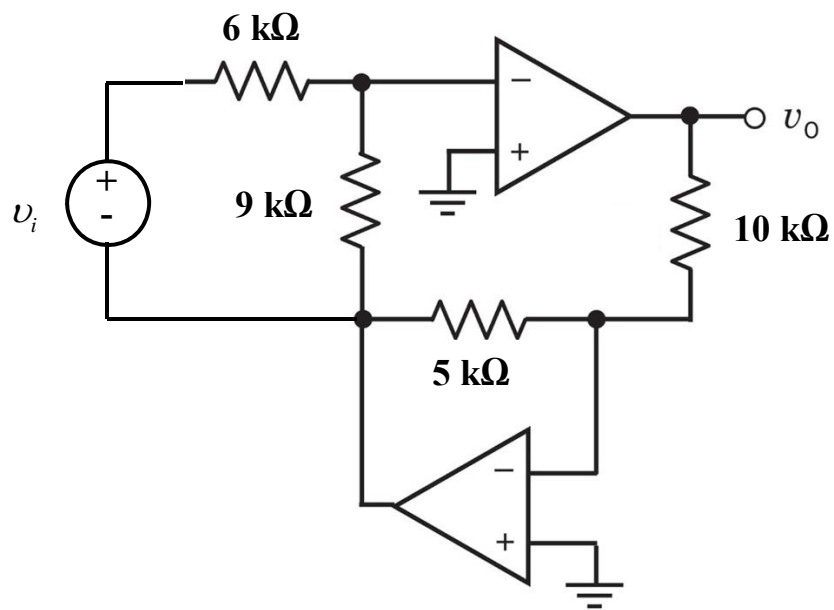


**Fig. 3**

**Question 2B:**

In the circuit in **Fig. 4**,

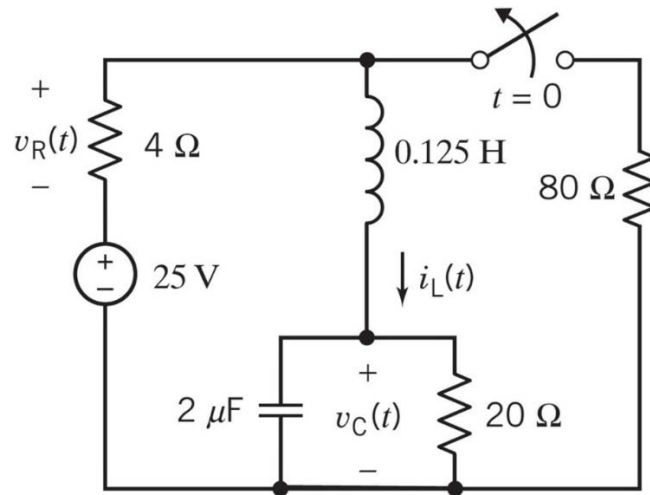
- i) If  $v_i = 5 \text{ V}$ , find  $v_o$ .
- ii) Find the voltage gain  $g = \frac{v_o}{v_i}$



**Fig. 4**

**Question 3A:**

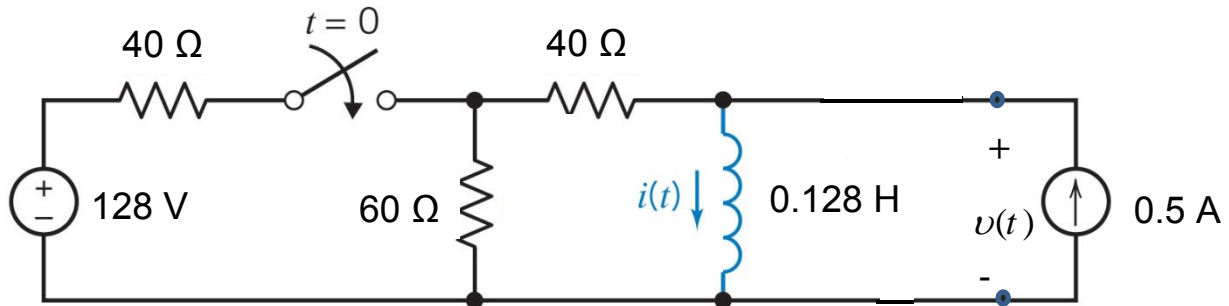
- a) In the circuit shown in **Fig. 5** the switch has been closed for a long time. Find  $i_L(0)$ ,  $v_C(0)$ , and  $v_R(0)$ .
- b) If the switch is opened at  $t = 0$ , determine  $i_L(0^+)$ ,  $v_C(0^+)$ , and  $v_R(0^+)$ .



**Fig. 5**

### Question 3B:

The circuit shown in **Fig. 6** is at steady-state with the switch open. Then the switch is closed at  $t = 0$ . After the switch closes the inductor current is given by  $i(t) = E + Fe^{-at}$  A.



**Fig. 6**

- Determine the values of the constants  $E$ ,  $F$ , and  $a$ .
- Sketch the current  $i(t)$
- Determine the voltage across the current source  $v(t)$ .
- Sketch the voltage  $v(t)$ .