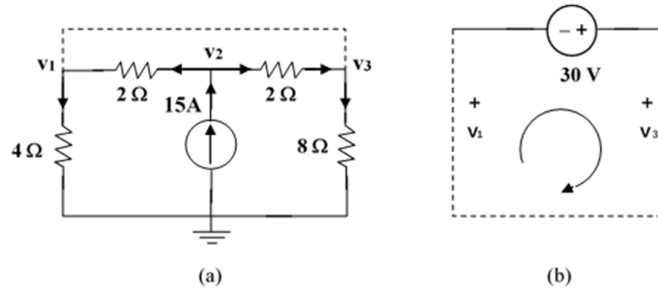


# EE1002 Principles of Electrical Engineering

## Assignment 2 --- Solution Summary

Q1



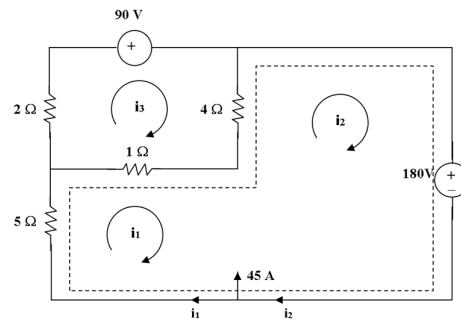
$$v_1 = 30 \text{ V}, v_2 = v_3 = 60 \text{ V}$$

Q2

$$i_0 = 16/9 = 1.7778 \text{ A}$$

$$v_{ab} = 30i_0 = 53.33 \text{ V}$$

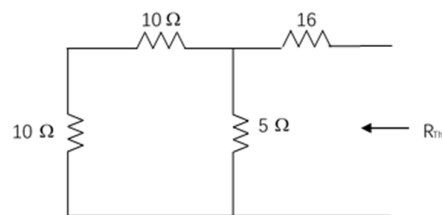
Q3



$$i_0 = i_1 - i_3 = -26 \text{ A}$$

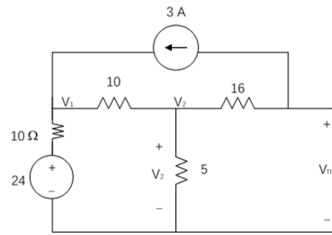
Q4

Obtain  $R_{Th}$  using the circuit below



$$R_{Th} = 20 \Omega$$

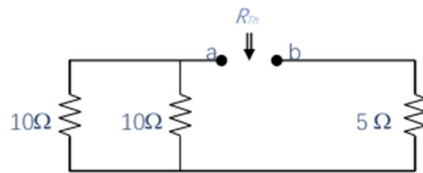
Obtain  $V_{Th}$  using the circuit below



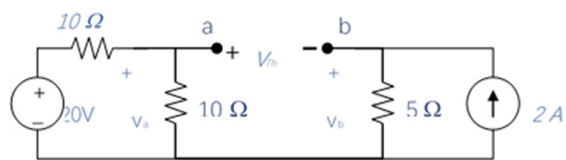
$$V_{Th} = -49.2 \text{ V}$$

**Q5**

Obtain  $R_{Th}$  and  $V_{Th}$  using the circuit below



(a)



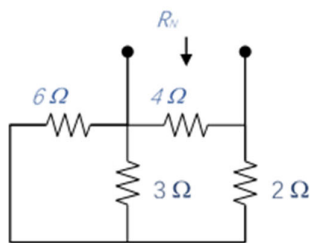
(b)

$$R_{Th} = 10 \Omega$$

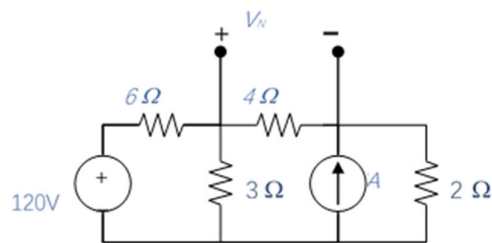
$$V_{Th} = 0 \text{ V}$$

**Q6**

(a)



(a)

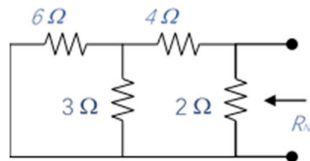


(b)

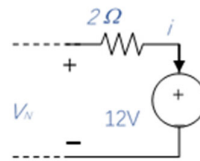
$$R_N = 2 \Omega$$

$$i_N = 7 \text{ A}$$

(b)



(c)

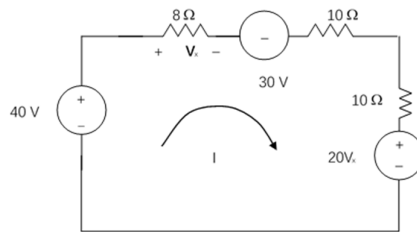


(d)

$$R_N = 1.5 \, \Omega$$

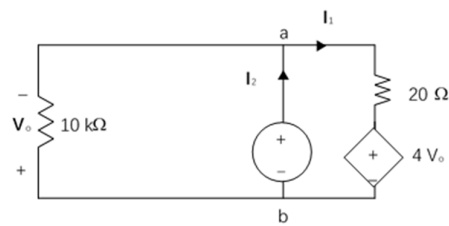
$$i_N = 19 / 1.5 = 12.667 \, \text{A}$$

**Q7**



$$V_x = 2.978 \, \text{V}$$

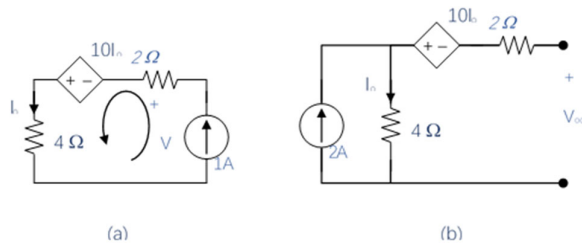
**Q8**



$$V_{Th} = 60 \, \text{V}$$

$$R_{Th} = 2857 \, \Omega = 2.857 \, \text{k}\Omega$$

**Q9**



(a)

(b)

$R_N = -4 \, \Omega$  (Note that the negative value of  $R_{eq}$  indicates that we have an active device (e.g., transistor) in the circuit since we cannot have a negative resistance in a purely passive circuit (e.g., resistor, capacitor, inductor).

$$i_N = -12 / -4 = 3 \, \text{A}$$