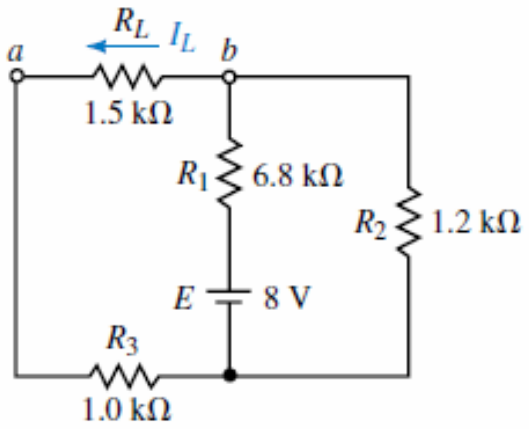
Network Theorems (part2)

Thévenin's Theorem

9) Find the Thévenin equivalent external to *RL in circuit of Figure 9-83.. Use* the equivalent circuit to find *Vab.*

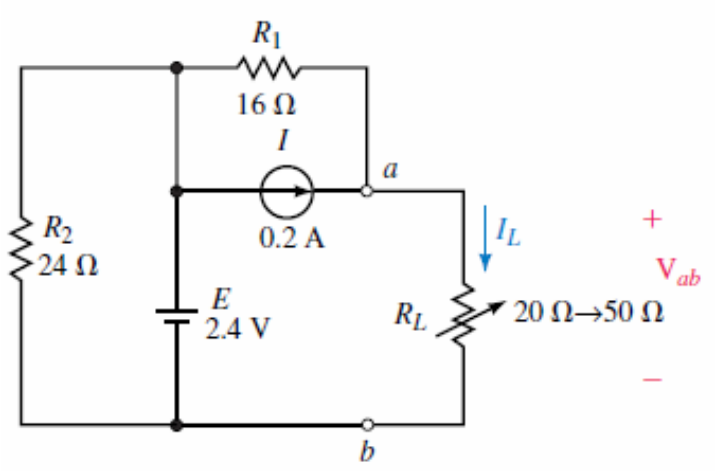


9. $R_{Th} = 2.02\ \text{k}\Omega$ $E_{Th} = 1.20\ \text{V}$ $V_{ab} = -0.511\ \text{V}$

11) Refer to the circuit of Figure 9–85:

a. Find the Thévenin equivalent circuit external to *RL.*

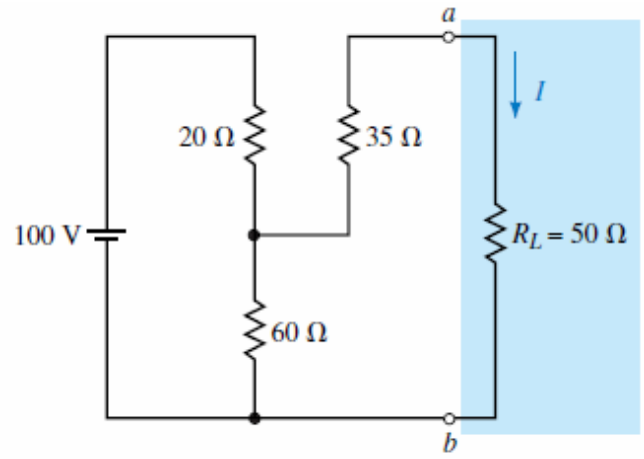
b. Use the equivalent circuit to determine *Vab when RL 20 Ω and when RL 50 Ω.*



11. a. $R_{Th} = 16\ \Omega$ $E_{Th} = 5.6$ V

b. When $R_L = 20\ \Omega$: $V_{ab} = 3.11$ V
When $R_L = 50\ \Omega$: $V_{ab} = 4.24$ V

13) Refer to the circuit of Figure 9–87:
a. Find the Thévenin equivalent circuit external to the indicated terminals.
b. Use the Thévenin equivalent circuit to determine the current through the indicated branch.

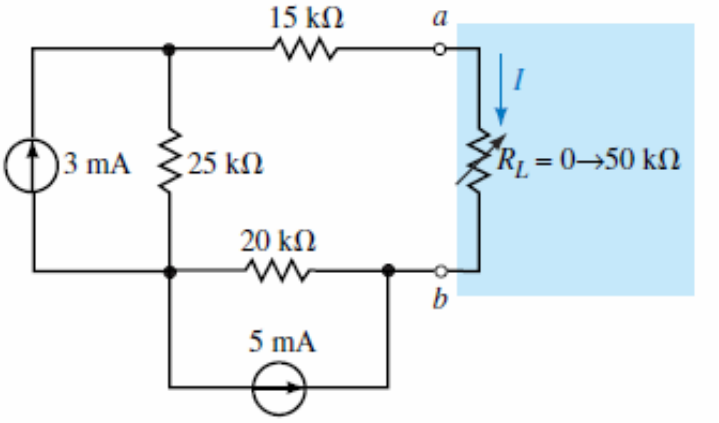


13. a. $E_{Th} = 75$ V $R_{Th} = 50\ \Omega$
b. $I = 0.75$ A

17) Refer to the circuit of Figure 9–91:

a. Find the Thévenin equivalent circuit external to *RL.*

b. Use the Thévenin equivalent circuit to find the current *I when RL 0,* 10 kΩ, and 50Ω k.



17. a. $R_{Th} = 60$ kΩ $E_{Th} = 25$ V

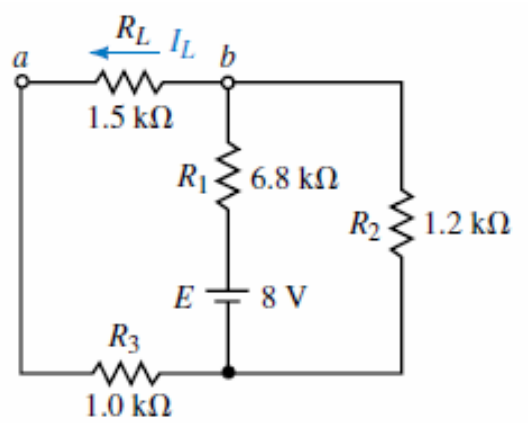
b. $R_L = 0$: $I = -0.417$ mA

$R_L = 10$ kΩ: $I = -0.357$ mA

$R_L = 50$ kΩ: $I = -0.227$ mA

Norton's Theorem

27) Find the Norton equivalent circuit external to RL in the circuit of the Figure . Use the equivalent circuit to find IL for the circuit.

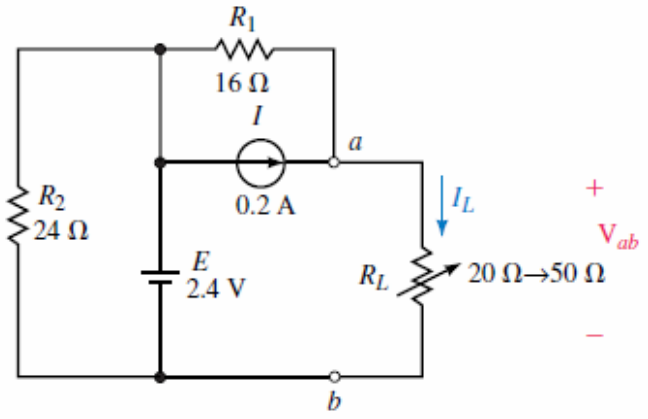


27. $I_N = 0.594$ mA, $R_N = 2.02$ kΩ, $I_L = 0.341$ mA

29. Refer to the circuit of Figure 9–85:

a. Find the Norton equivalent circuit external to R_L.

b. Use the equivalent circuit to determine I_L when $R_L = 20\ \Omega$ and when $R_L = 50\ \Omega$.



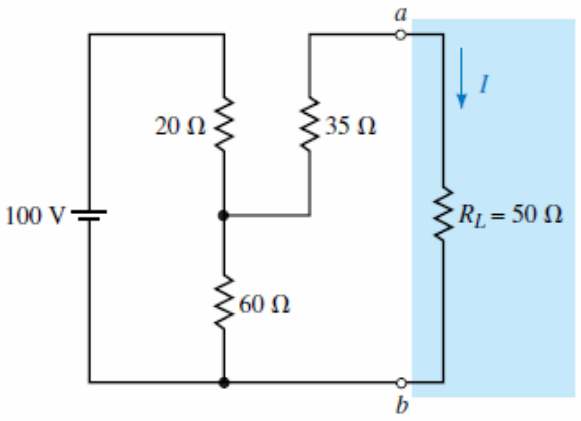
29. a. $I_N = 0.35$ A, $R_N = 16\ \Omega$

b. $R_L = 20\ \Omega$: $I_L = 0.156$ A

$R_L = 50\ \Omega$: $I_L = 0.085$ A

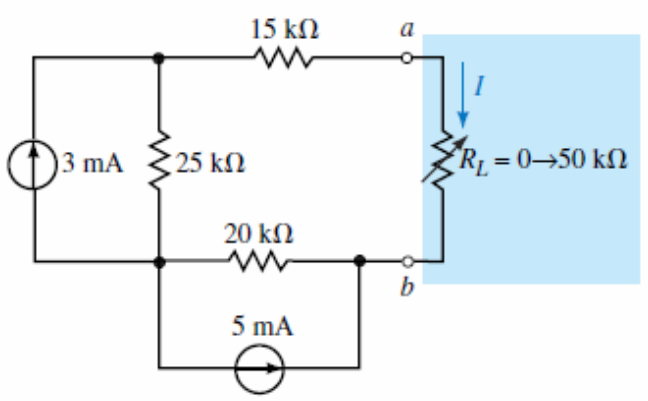
31. a. Find the Norton equivalent circuit external to the indicated terminals of Figure 9–87.

b. Convert the Thévenin equivalent circuit of Problem 13 to its Norton equivalent.



31. a. $I_N = 1.50\ \text{A}$, $R_N = 50\ \Omega$
b. $I_N = 1.50\ \text{A}$, $R_N = 50\ \Omega$

33. Repeat Problem 31 for the circuit of Figure 9–91.



33. a. $I_N = 0.417$ mA, $R_N = 60$ kΩ
b. $I_N = 0.417$ mA, $R_N = 60$ kΩ