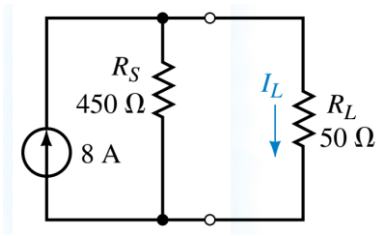
Sheet (6)

Q1:- Answer the following questions

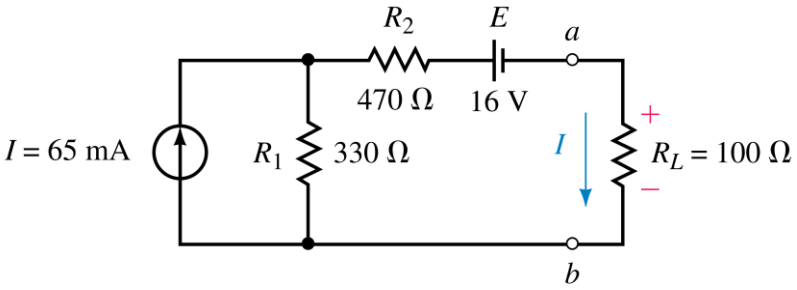
1. Refer to the circuit of the following figure:

   a. Solve for the current through the load resistor using the current divider rule.

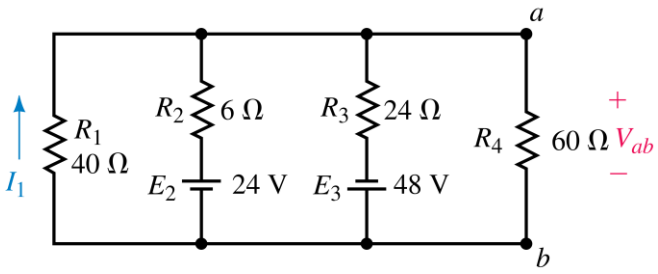
   b. Convert the current source into its equivalent voltage source and again determine the current through the load.



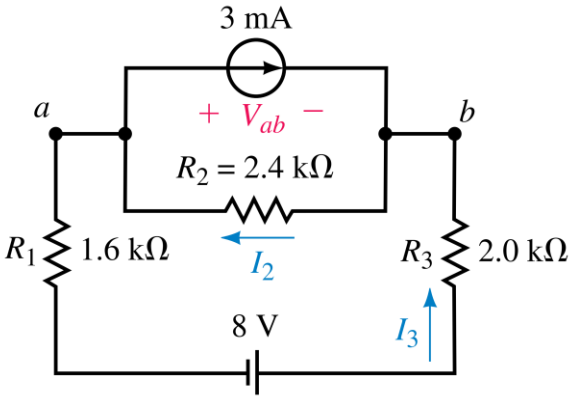
2. Find V_{ab} and I_2 for the network of the following figure using source coversion.



3. Convert the voltage sources of the following figure into current sources and solve for the current I_1 and the voltage V_{ab}.:



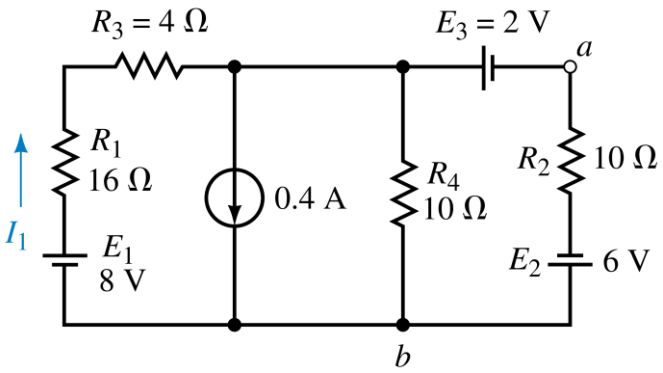
4. For the circuit of the following figure, using source conversion, find the voltage V_{ab} and the current I_3.



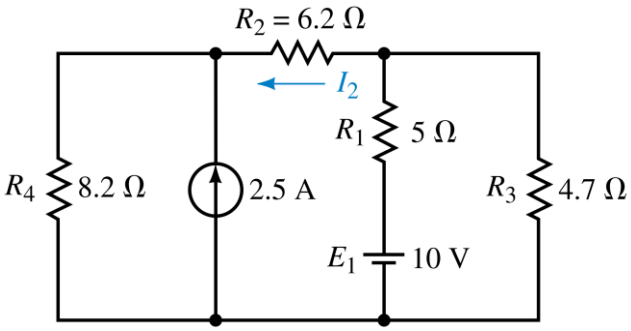
5. Refer to the circuit of the following figure, using branch-current analysis:

   a. Solve for the current I_1.

   b. Determine the voltage V_{ab}.



6. Refer to the circuit of the following figure, write the branch-current equations and solve for the current I_2.

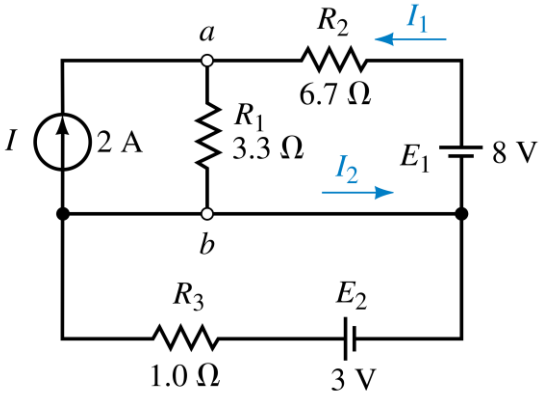


7. Refer to the circuit of the following figure,

   a. Write the branch-current equations.

   b. Solve for the currents I_1 and I_2.

   c. Determine the voltage V_{ab}.

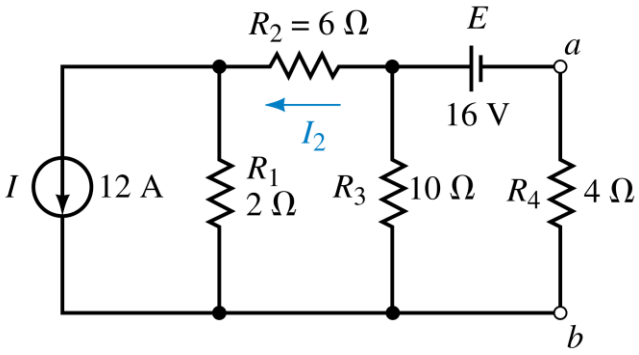


8. Refer to the circuit of problem 5, use mesh analysis to solve for the current I_1.

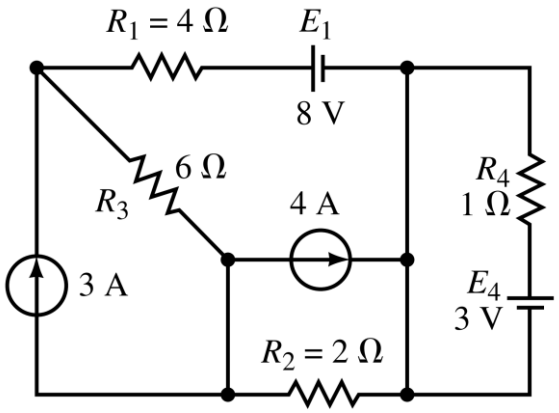
9. Refer to the circuit of problem 6, use mesh analysis to solve for the current I_2.

10. Refer to the circuit of problem 7, use mesh analysis to solve for the current I_1, I_2 and the V_{ab}.

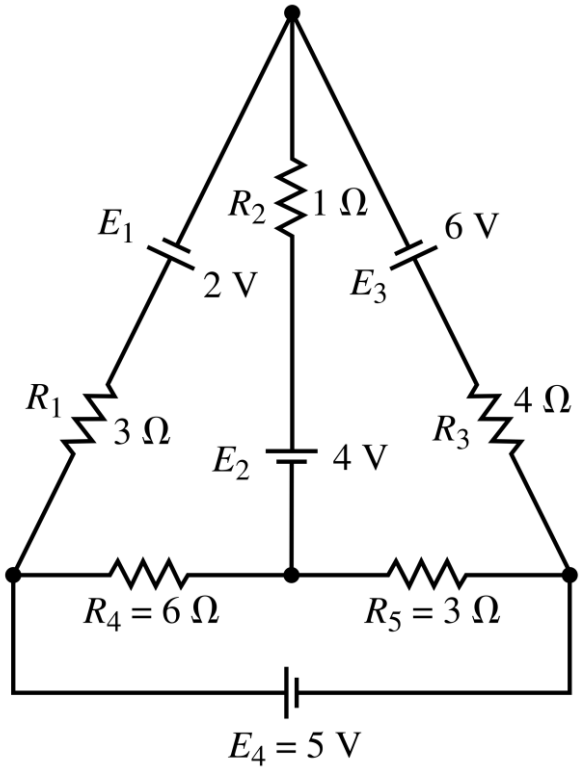
11. Refer to the circuit of the following figure, use mesh analysis to determine I_2 and V_{ab}.



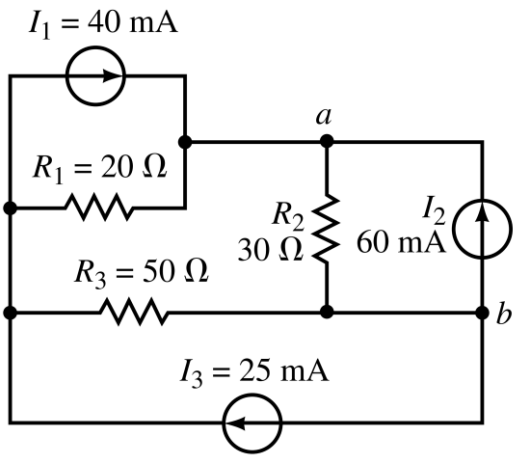
12. Using mesh analysis, determine the current through the 6Ω resistor in the following figure.



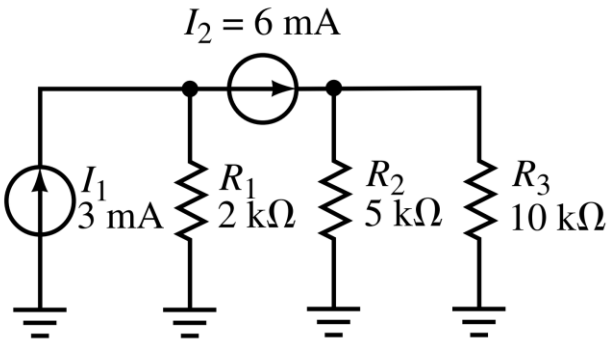
13. Refer to the circuit of the following figure, use mesh analysis to determine the output power from each source.



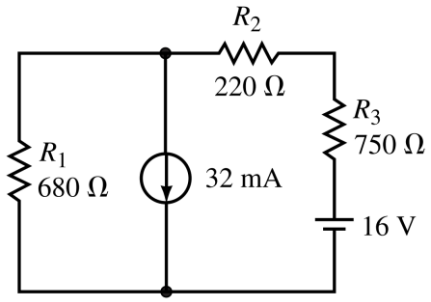
14. Write the nodal equations for the circuit of the following figure and determine the voltage V_{ab}.



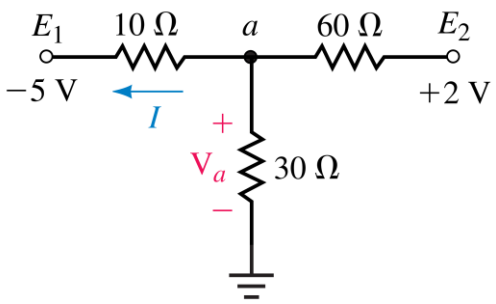
15. Write the nodal equations for the circuit of the following figure and solve for the nodal voltages.



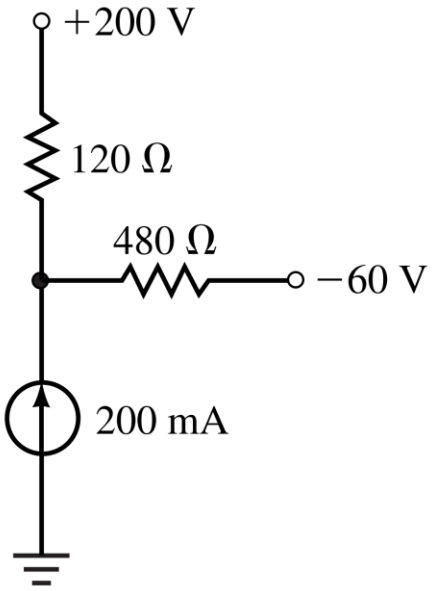
16. Use superposition to determine the voltage drop across each of the resistors of the circuit in the following figure.



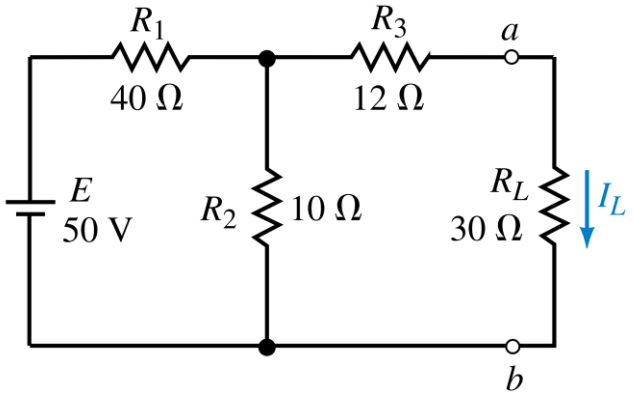
17. Use superposition to solve for the voltage V_a and the current I in the circuit of the following figure.



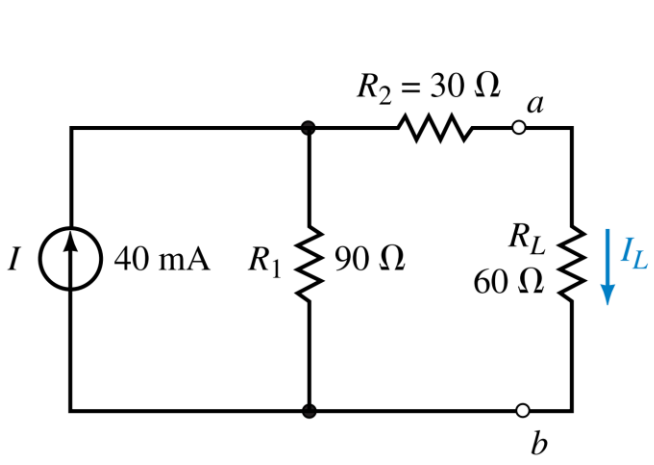
18. Using superposition, find the current through the 480 Ω resistor in the circuit of the following figure.

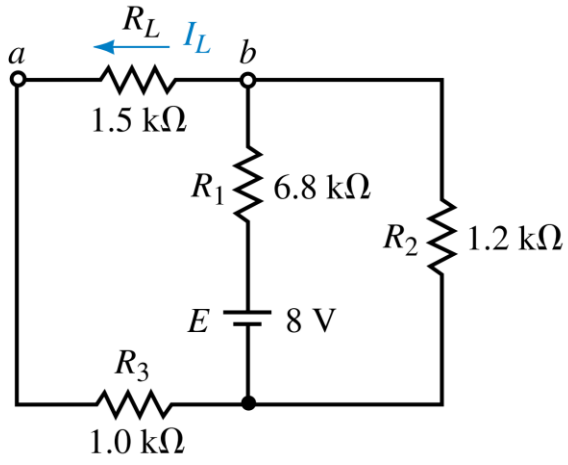


19. Find the Thévenin equivalent external to R_L in circuit of the following figure. Use the equivalent circuit to find V_{ab}.



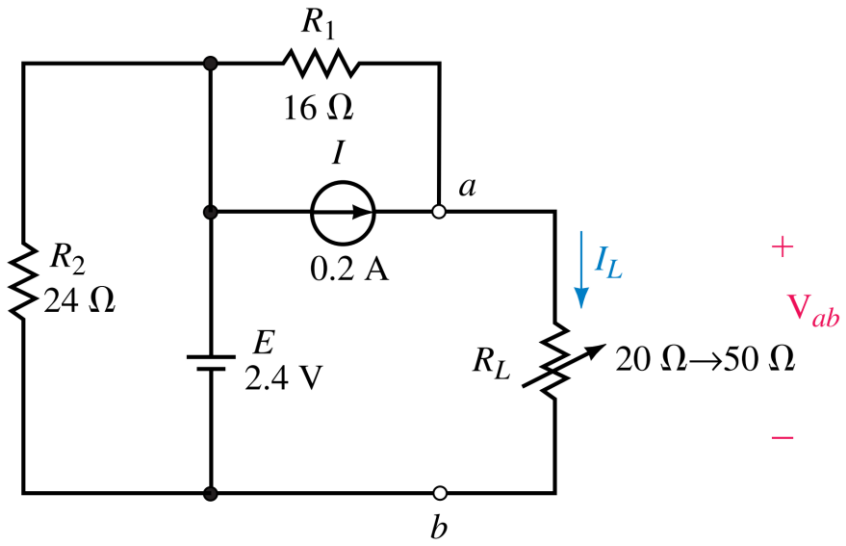
20. Repeat the previous problem for the circuits of the following figure.





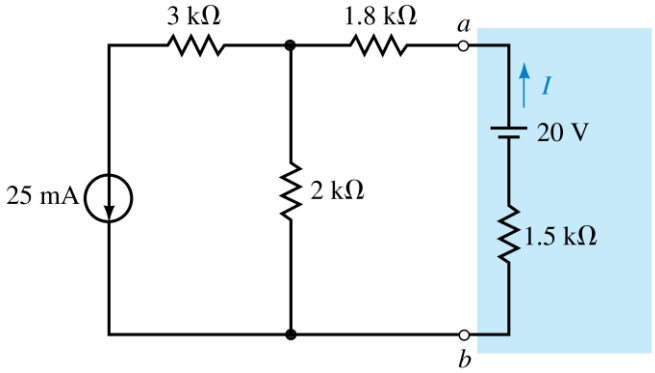
21. Refer to the circuit of the following figure:

    a. Find the Thévenin equivalent circuit external to R_L.
    b. Use the equivalent circuit to determine V_{ab} when $R_L = 20\ \Omega$ and when $R_L = 50\ \Omega$.

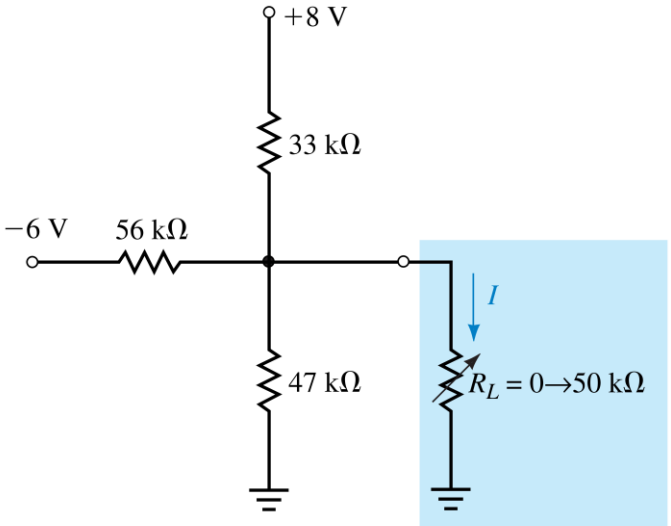


22. Refer to the circuit of the following figure:

    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.



23. Find the Thévenin equivalent circuit of the network external to the indicated branch as shown in the following figure.



24. For the circuit of problem 21 ,
    a. Determine the value of R_L so that maximum power is delivered to the load.
    b. Calculate the value of the maximum power which can be delivered to the load.
    c. Sketch the curve of power versus resistance as R_L is adjusted from 0 Ω to 50 Ω in increments of 5 Ω.

25. Find the Norton equivalent circuit external to R_L in the circuit of problem 19. Use the equivalent circuit to find I_L for the circuit.

26. Refer to the circuit of problem 21:
    a. Find the Norton equivalent circuit external to R_L.
    b. Use the equivalent circuit to determine I_L when R_L = 20 Ω and when R_L = 50 Ω.