Tutorial Sheet-1 (DC Network)

Q1. Determine the three mesh currents in Fig. 1.

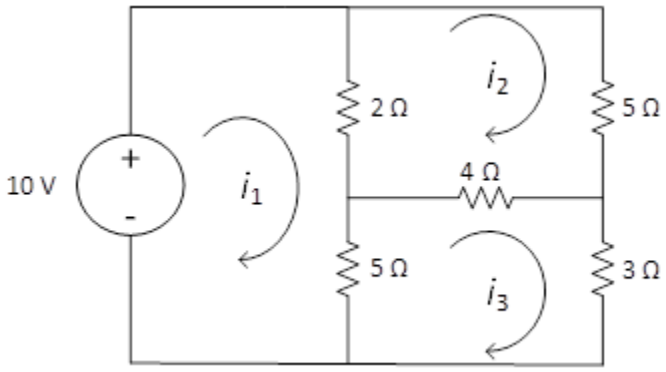


Fig. 1

Q2. In Fig. 2, for the circuit voltage across 6Ω resistor is 6 V and current through 4Ω resistor ¾ A. Determine the the source voltage V and the value of resistance R.

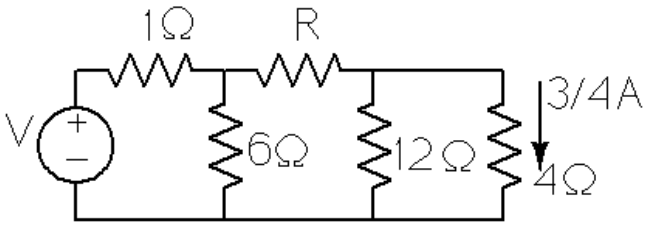


Fig. 2

Q3. Find out the voltage, current, and power associated with each element of the circuit of Fig3..

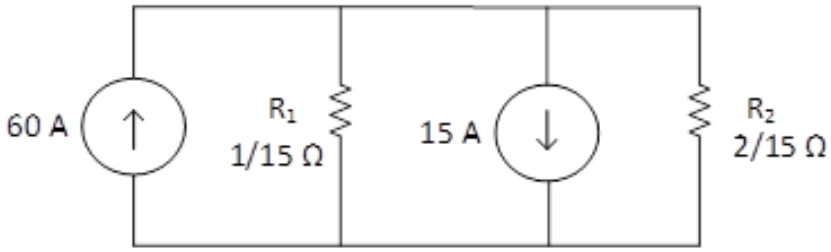


Fig. 3

Q4. Determine the voltage V_x in the following circuit.

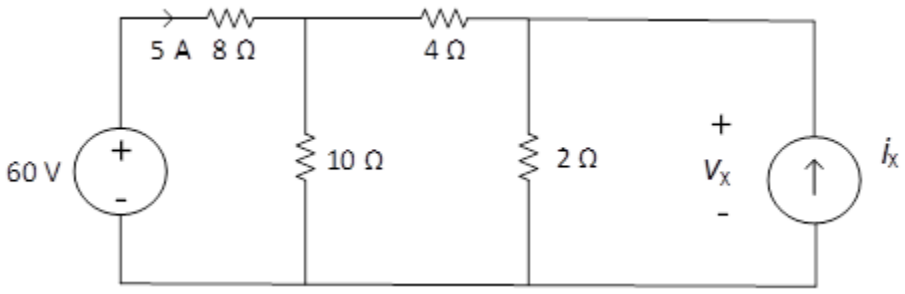


Fig. 4

Q5. Find the current through the 2 Ω resistor and voltage across 10 Ω resistor.

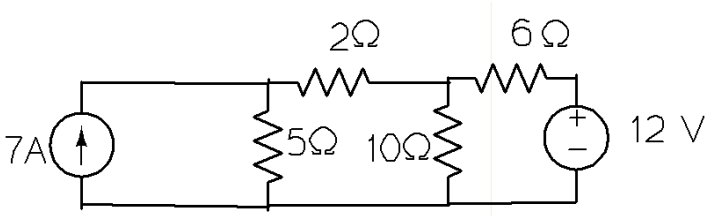
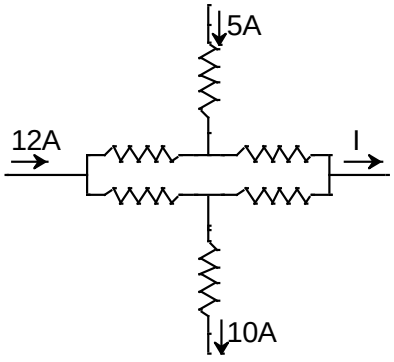


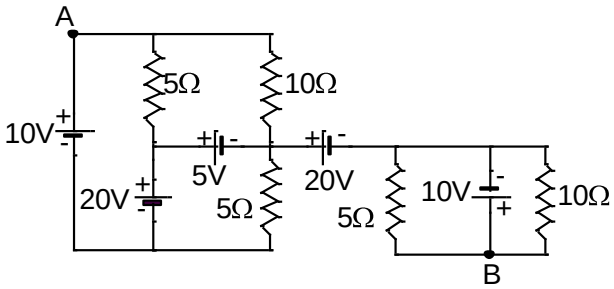
Fig. 5

Q6. (a) Calculate the value of current I in Fig. 6(a)

(b) Calculate V_{AB} in Fig. 6(b). Also calculate the current through the 5V source.



(a)



(b)

Fig. 6

Q7. Calculate the value of I_1 of Fig. 7 using (a) Mesh Analysis and (b) Node Analysis.

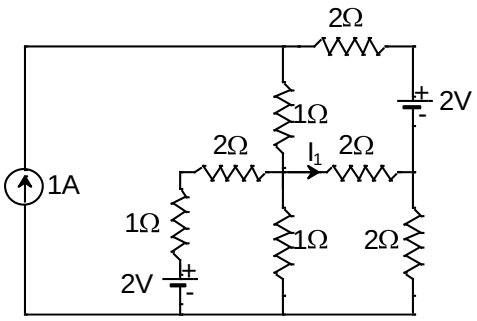


Fig. 7

Q8. Calculate the current through the 4Ω resistance of Fig. 8 using three network theorems (Superposition, Thevenin's and Norton's). Also, calculate the power delivered/received by the 2V and the 1A sources.

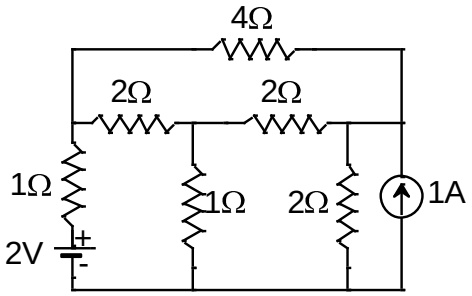


Fig. 8

Q9. Determine the amount of power delivered/received by the voltage source and the current source in the circuit of Fig. 9.

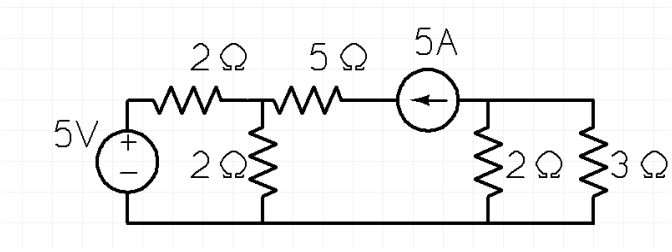


Fig. 9

Q10 Solve the circuit shown in Fig. 10 using mesh method of analysis and determine the mesh currents I_1, I_2 and I_3. Determine the power associated with the 10 V voltage source.

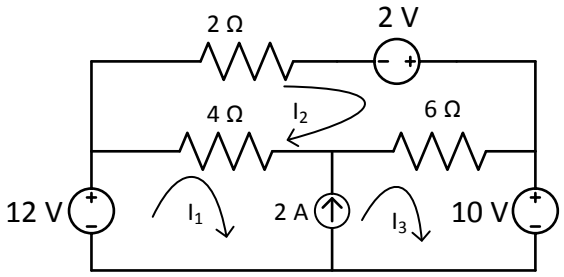


Fig. 10

Q11. Determine the current i_x in Fig. 11.

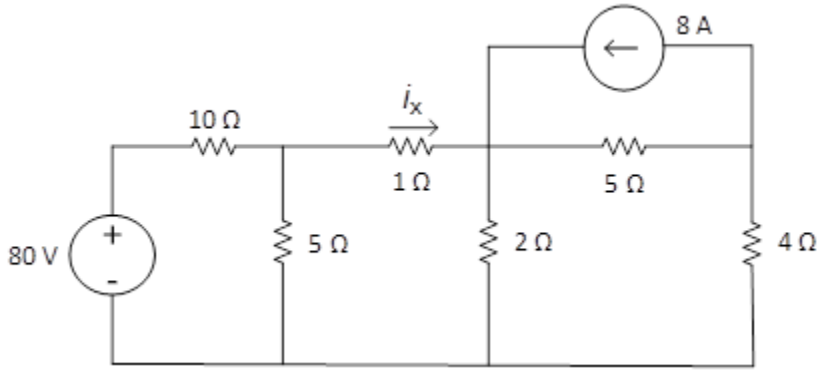


Fig. 11

Q12. Find the Thevenin equivalent voltage as viewed by the resistance R. Find the value of R for maximum power dissipation in it.

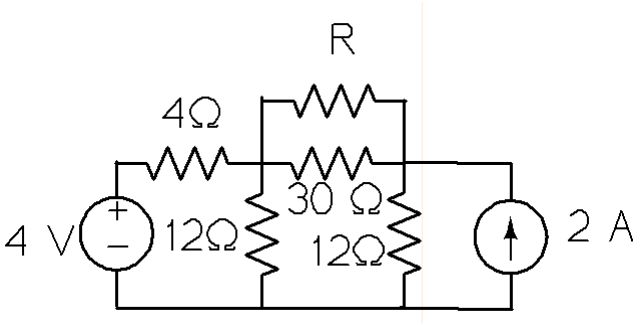


Fig. 12