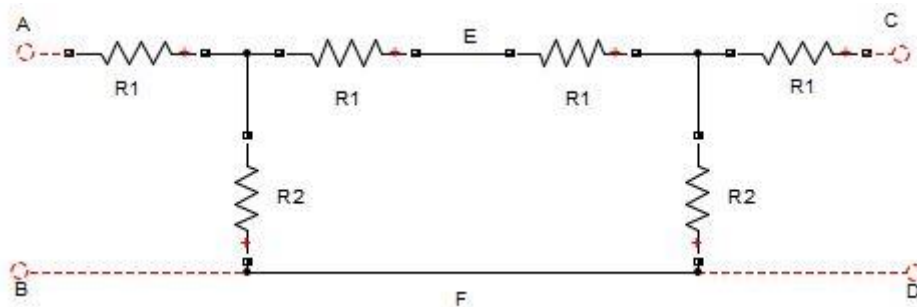
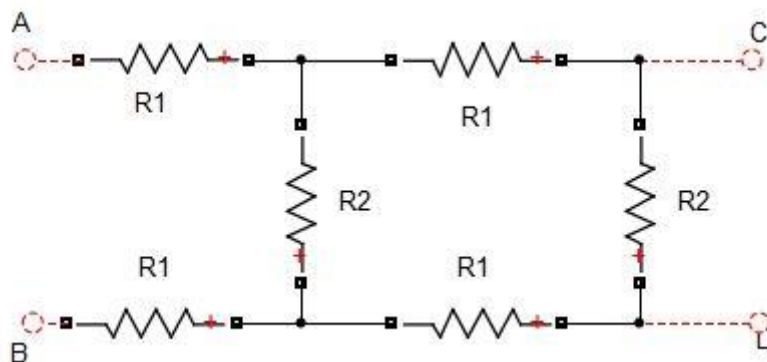


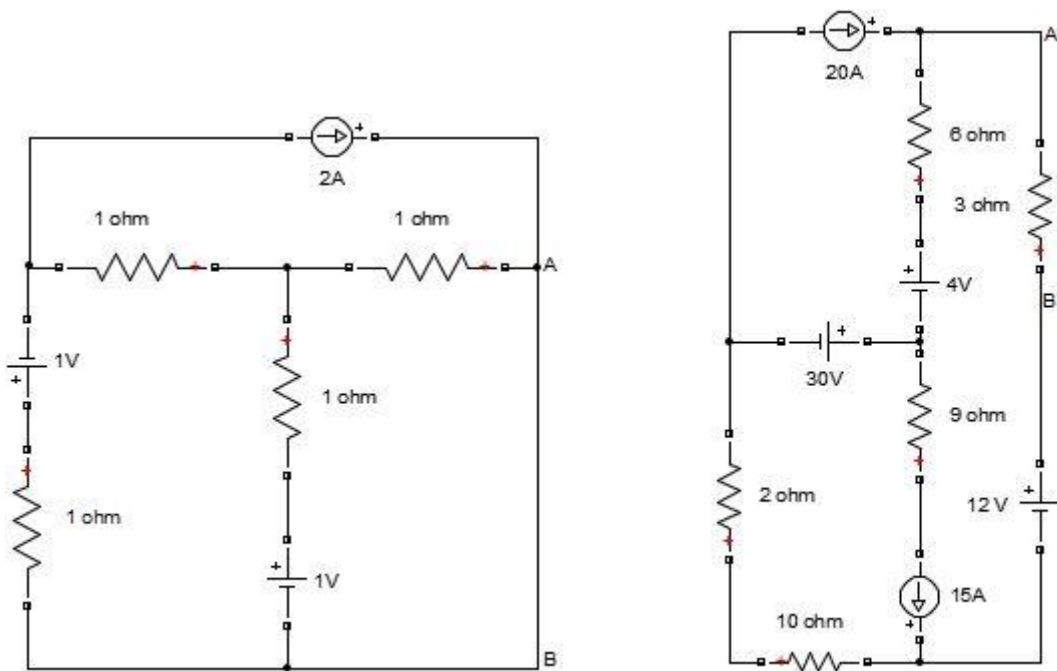
1. In the circuit below, four resistances each of  $R_1 \Omega$ , and two resistances each of  $R_2 \Omega$ , are connected to four terminals  $A$ ,  $B$ ,  $C$ , and  $D$ . A potential difference of  $V$  is applied across the terminals  $AB$  and a resistance of  $R_3 \Omega$  is connected across the terminals  $CD$ . Find the relationships that must hold among  $R_3$ ,  $R_1$ , and  $R_2$  in order that the potential difference across  $EF$  is  $V/2$ .



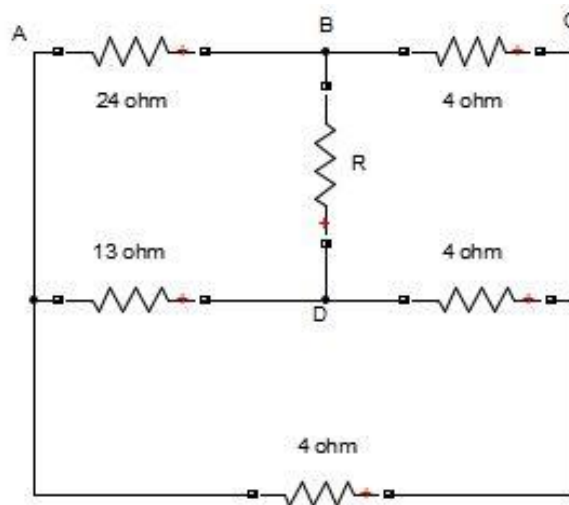
2. In the circuit below, determine the values of  $R_1$  and  $R_2$  so that the resistance of the circuit as viewed from the points  $A$  and  $B$  is  $500 \Omega$  and also when a voltage of  $V$  is applied across  $AB$ , the voltage at  $CD$  is  $V/2$ .



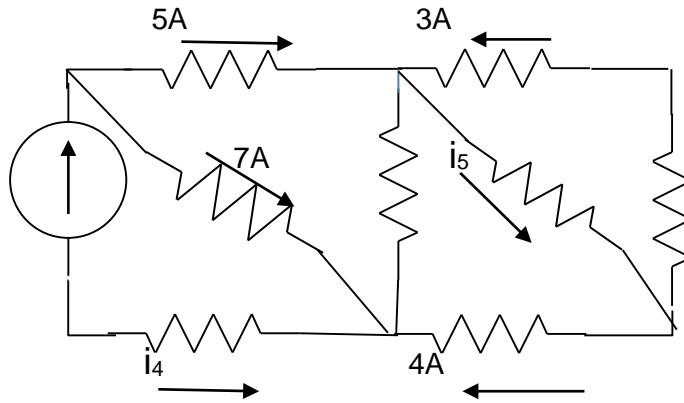
3. Find out current  $I_{AB}$ , using mesh analysis in the circuits diagram given below.



4. Calculate the value of the unknown resistance  $R$  which will cause a current of 3A to flow in it when a 44V source is connected across terminals A and D.

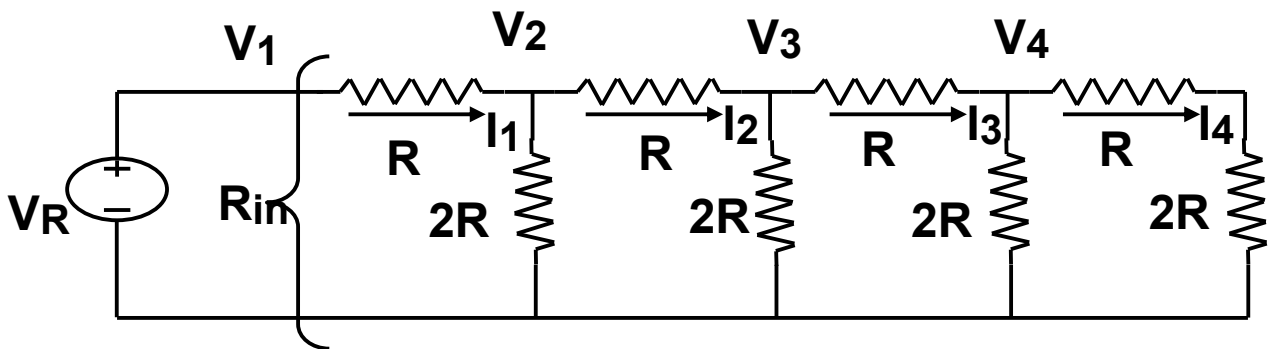


5. Determine the currents  $i_4$ , and  $i_5$  in the following circuit

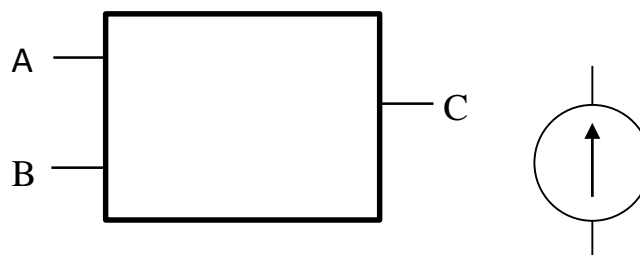


6. Figure below shows a  $R$  &  $2R$  network that is often used in D-A convertors. Find  $V_1$ ,  $V_2$ ,  $V_3$  and  $V_4$  in terms of  $V_R$ . What is the equivalent input resistance seen at  $R$  ?

Also find  $I_1$ ,  $I_2$ ,  $I_3$  and  $I_4$ .

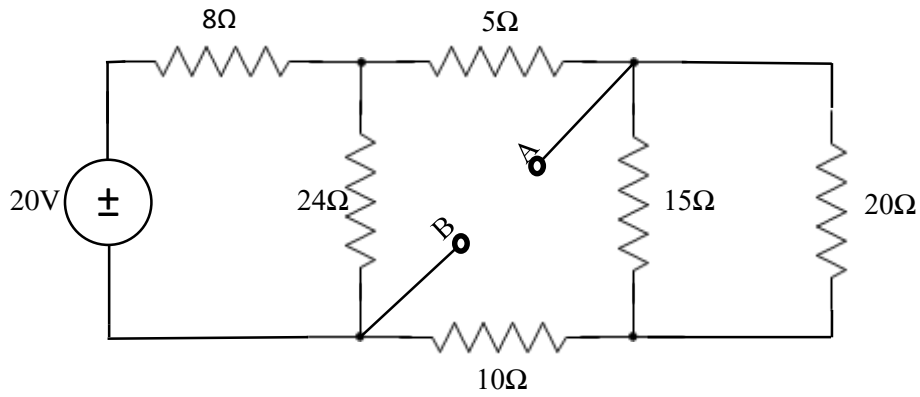


7. You are given a black box with three terminals as shown in fig 3. Box has five  $2\Omega$  resistors.

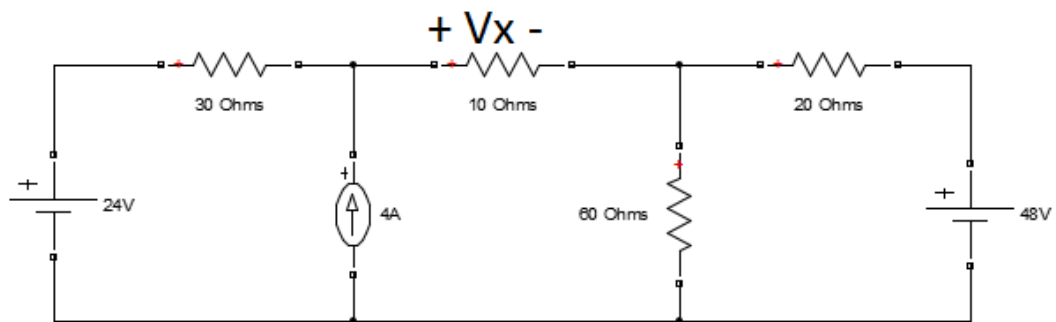


Using ohm-meter we get the following resistance values between the terminals:

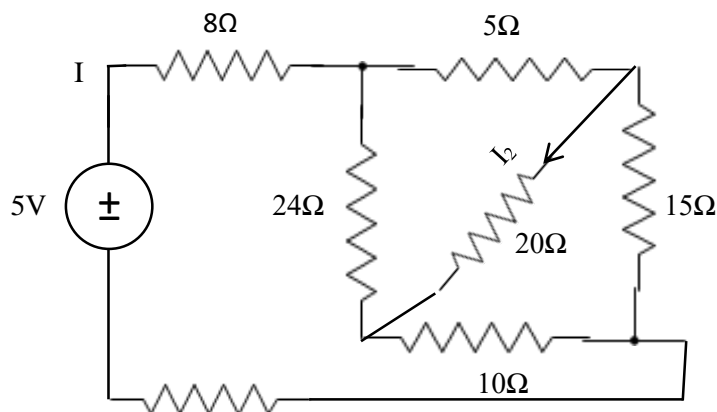
A-B : 3  $\Omega$ ; B-C : 6  $\Omega$ ; and A-C : 5  $\Omega$ . Find the configuration of resistances in the black box.



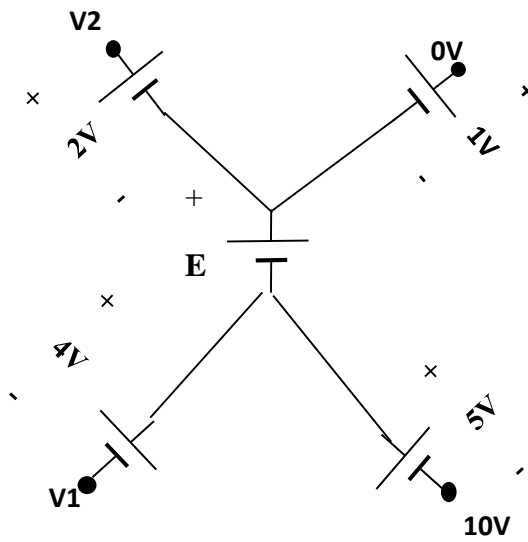
8. (Optional) Find Thevenin voltage and resistance at terminal AB.



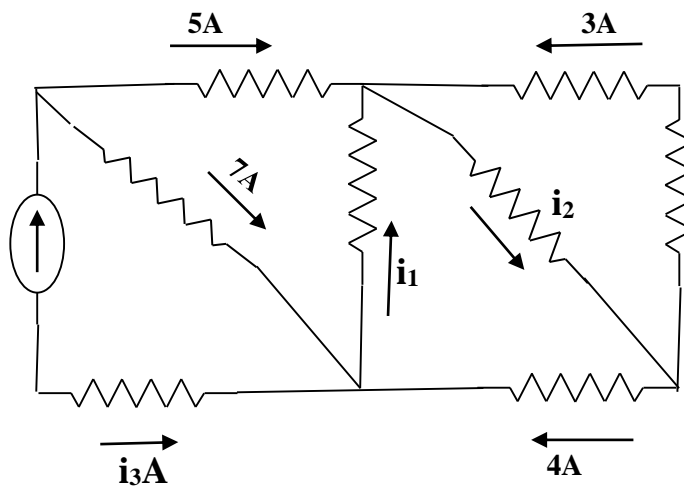
9. In the following circuit, find current I and, then current I<sub>2</sub>.



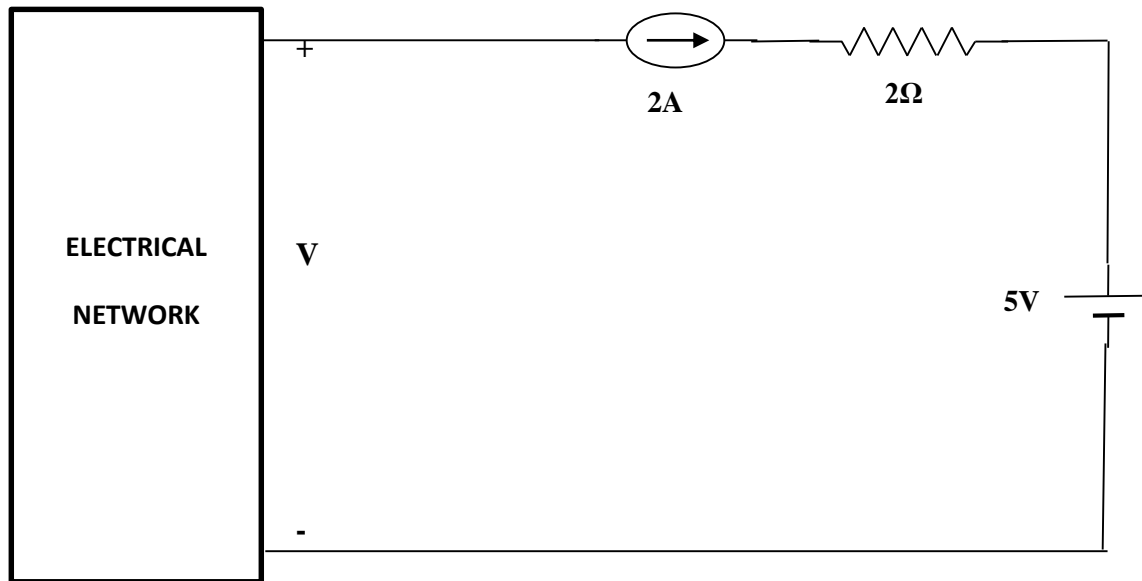
10. In the circuit given below, what are the values of voltage sources  $E$ ,  $V1$ ,  $V2$ ?



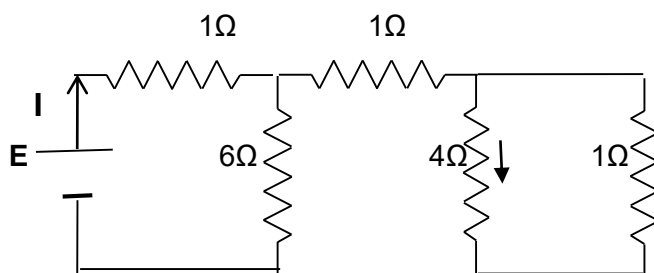
11. What are the currents  $i_1$ ,  $i_2$  and  $i_3$  in the following circuit?



12. For the following circuit what is the Voltage  $V$ ? (Current Source is Ideal) (Hint: Is it possible to find out the value of  $V$ ? If yes what is the value? If not why?)

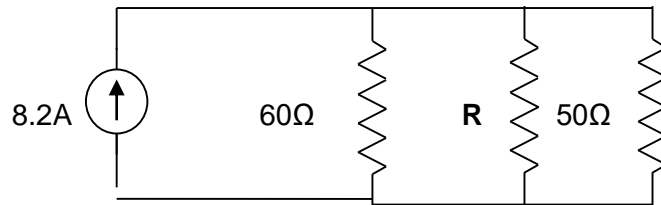


13. Consider the following circuit



If the current through  $4\Omega$  resistor is  $2A$  then find  $E$  and  $I$  as marked.

14. What value of  $R$  will ensure that the current through the 60 ohm resistor of the below circuit is exactly 1A?



15. Find the value of  $V$  in the below circuit.

