

Q.1

Find the equivalent resistance at point a, b of given circuit. Write each step of the calculation to get maximum marks. Draw the circuit diagram of each step otherwise you will lose your marks.

1) On the right side **2 ohm and 2 ohm** resistors are in **series** so total resistance = $2 + 2 = 4\text{ohms}$

Replace the two resistors with a single 4 ohm resistor

2) Now **4 ohm and 4 ohm resistor** are in **series** so total resistance = $4 + 4 = 8\text{ ohms}$

Replace the two resistors with a single 8 ohm resistor

3) Now **8 ohm resistor is in series with 6 ohm resistor**, so $TR = 8 + 6 = 14\text{ ohms}$

Replace the two resistors with a single 14 ohm resistor

4) Now **14 ohm resistor is in parallel with 8 ohm resistor** so $TR = 14 \cdot 8 / 14 + 8 = 112 / 22 = 5\text{ ohms}$ approx.

Replace the two resistors with a single 5 ohm resistor

5) Now the **5 ohm and 5ohm resistor are in series** so $TR = 5 + 5 = 10\text{ ohms}$

Q.2

Using the division rule, find **V** and **I** mentioned in the given circuit.

Using division rule of current:

1) Current I along 2 ohm resistor is $(4/4+2) \times 12\text{A} = (4/6) \times 12 = 0.666 \times 12 = 8\text{ A}$ approx
so $V = IR = 8 \times 2 = 16\text{V}$

2) Current along 4 ohm resistor is $(2/4+2) \times 12 = (2/6) \times 12 = 4\text{ A}$
so $I = 4\text{A}$

Q.3

For the given circuit below, find current flow through each element, for the case when

- Point a, b is open.
- Point a, b is closed.

Please try to solve this by yourself. It is very easy.

Hint when point a,b is open I_2 and $I_3 = 0$

use the following formulae:

Power (watt) = $V \times I$

Current divider rule as in Q2.

Also draw the circuits yourselves.