Example problems – combinations of resistors

R1

R2

R3

24 volts

First circuit: **Vsource = 24 volts**

**Isource = 1.6 A**

**R2 = 36 Ω**

**R3 = 20 Ω**

1. Show the flow of current through

the circuit. Label the current through

each resistor and from the source.

2. Label the positive and negative ends

of the source and each resistor.

3. Identify and label the two junctions

in the circuit.

4. Draw the two circuit loops as

individual circuits.

5. Identify all resistors that are in series with the source, if any.

6. Identify all resistors that are in parallel with the source, if any.

7. Identify all resistors that are in series with each other, if any.

8. Identify all resistors that are in parallel with each other, if any.

9. Calculate the voltage across each resistor and the current through each resistor.

10. Calculate the resistance of resistor 1.

11. Calculate the resistance of the circuit in two different ways.

Second circuit: **Vsource = 24 volts**

**R1 = 30 Ω**

**R2 = 60 Ω**

24 volts

R3

R1

R2

**R3 = 40 Ω**

1. Show the flow of current through

the circuit. Label the current through

each resistor and from the source.

2. Label the positive and negative ends

of the source and each resistor.

3. Identify and label the two junctions

in the circuit.

4. Draw the two circuit loops as individual circuits.

5. Identify all resistors that are in series with the source, if any.

6. Identify all resistors that are in parallel with the source, if any.

7. Identify all resistors that are in series with each other, if any.

8. Identify all resistors that are in parallel with each other, if any.

9. Calculate the total resistance of the circuit.

10. Calculate the current produced by the source.

11. Calculate the voltage across each resistor and the current through each resistor.

Given the circuit below and the information about the circuit below, do the following:

RA

RC

RD

RB

RE

RF

-

+

|  |  |  |  |
| --- | --- | --- | --- |
| resistor | resistance in Ω | voltage across in volts | current through in A |
| A | 60 |  |  |
| B | 15 |  |  |
| C | 40 | **30** |  |
| D | 30 |  |  |
| E | 20 |  | **0.25** |
| F | 100 |  |  |

1. Show the flow of current through the circuit. Label the current through each resistor and from the source.

2. Label the positive and negative ends of the source and each resistor.

3. Identify and label the six junctions in the circuit.

4. Draw the four circuit loops as individual circuits.

5. Identify all resistors that are in series with the source, if any.

6. Identify all resistors that are in parallel with the source, if any.

7. Identify all resistors that are in series with each other, if any.

8. Identify all resistors that are in parallel with each other, if any.

9. Calculate the current through each resistor and the current produced by the source.

10. Calculate the voltage across each resistor and the voltage of the source.

11. Calculate the total resistance of the circuit in two different ways.