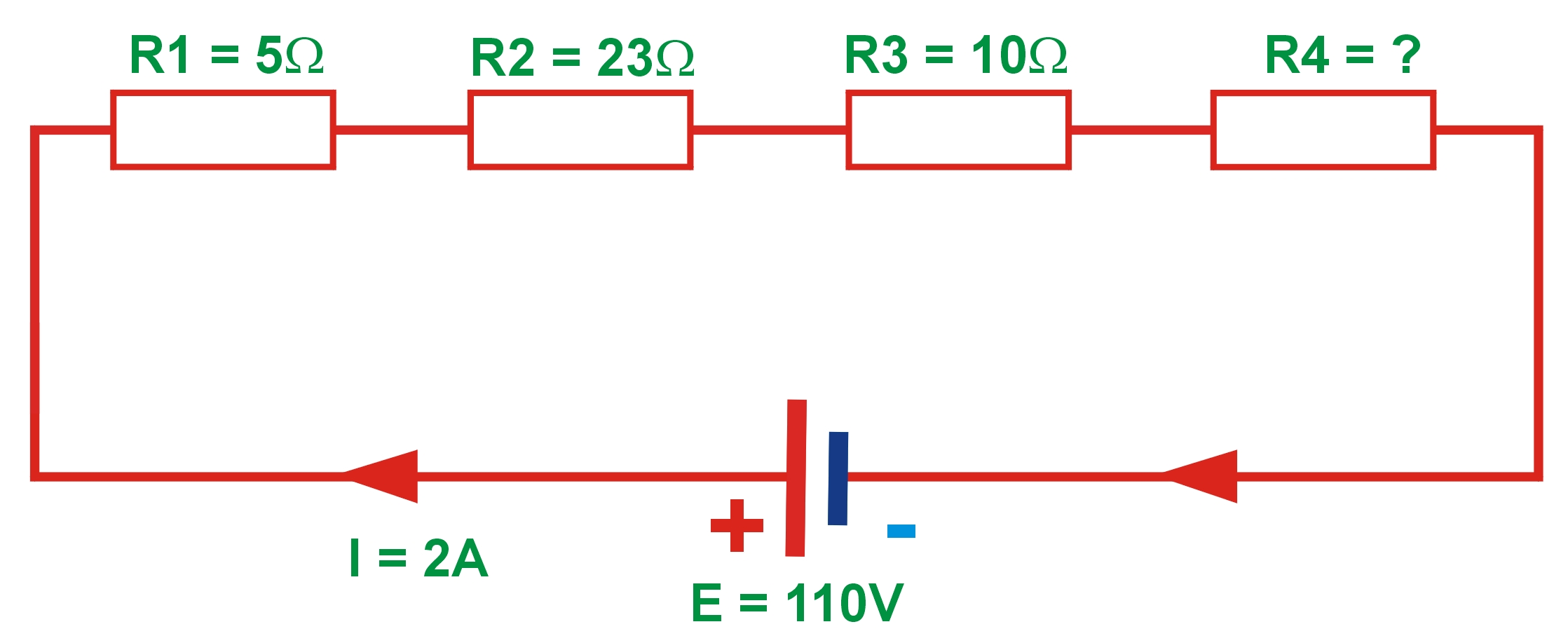
Unit 114: Electrotechnical systems and equipment

# Worksheet 2: Know the underlying principles for electrotechnical work 2 (tutor)

Resolve the following problems relating to series and parallel resistive circuits.

1. Complete the following table for resistors that are all connected in series.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **R1** | **R2** | **R3** | **R4** | **RT** |
| **a** | 7 Ω | 10 Ω | 8 Ω | 15 Ω | 40 Ω |
| **b** | 7 Ω | 16 Ω | 8 Ω | 19 Ω | 50 Ω |
| **c** | 1.5 Ω | 5.6 Ω | 8.2 Ω | 7.3 Ω | 22.6 Ω |
| **d** | 0.03 Ω | 0.105 Ω | 1.06 Ω | 2.007 Ω | 3.202 Ω |
| **e** | 15 MΩ | 21.3 MΩ | 1.4 MΩ | 5.3 MΩ | 43 MΩ |
| **f** | 15 mΩ | 83 mΩ | 26 mΩ | 9 mΩ | 133 mΩ |
| **g** | 200 KΩ | 500 KΩ | 10 kΩ | 1.2 MΩ | 1.91 MΩ |



1. For this circuit find:
2. the value of R4
3. the voltage drop across each resistor

**V = 110V**

1. 17Ω
2. R1 = 10V, R2 = 46V, R3 = 20V, R4 = 34V
3. Three resistors with values of 0.012Ω, 0.015Ω & 0.008Ω are connected in parallel across a 2.4 V DC supply. Calculate:
4. the current flowing in each resistor

0.012Ω = 200A

0.015Ω = 160A

0.008Ω = 300A

1. the total current drawn from the supply.

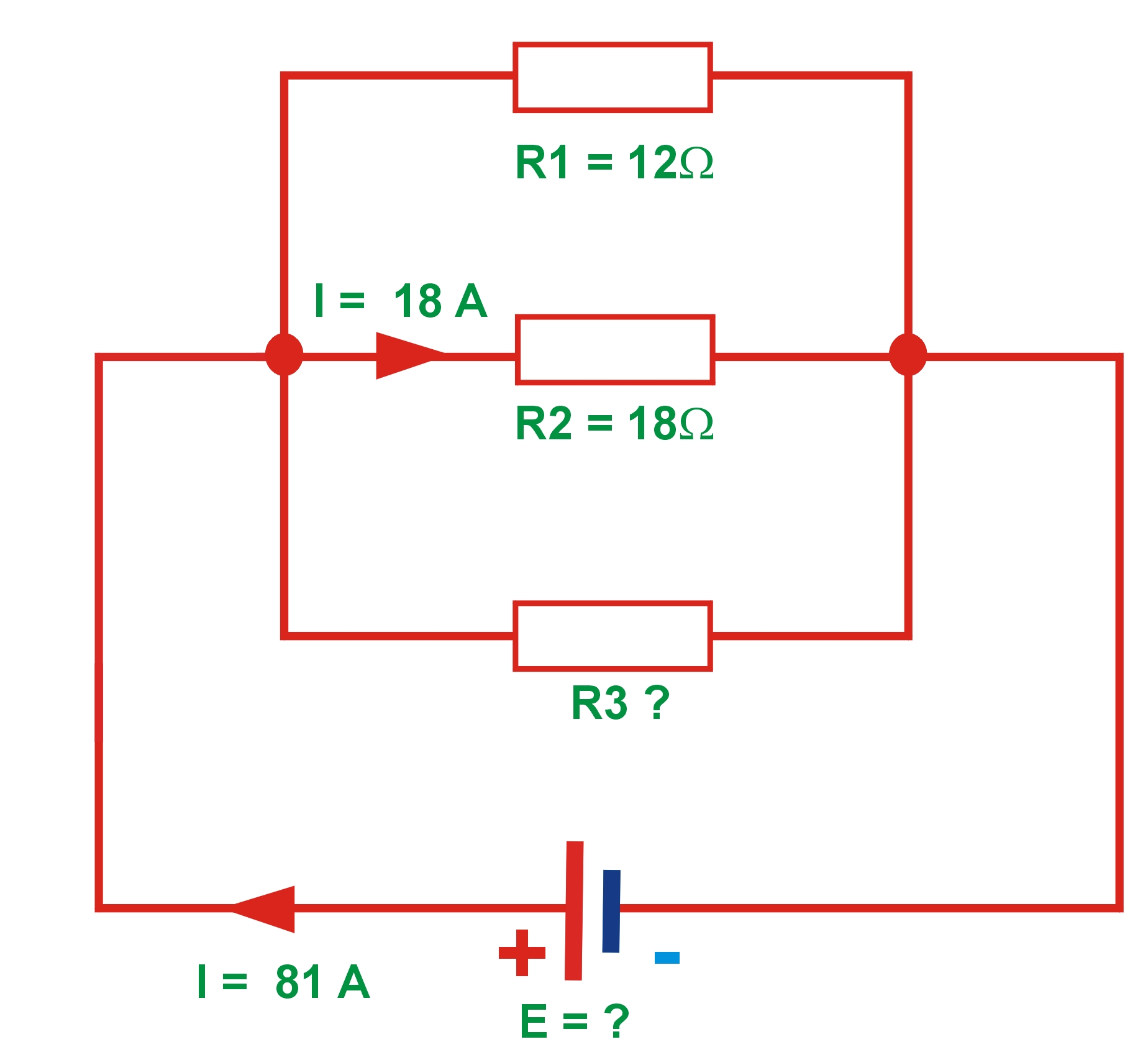
IT = 660A

1. Two resistors of 48Ω and 80Ω are connected together in parallel. What would the value of a third resistor have to be, when connected in parallel with the first two, to give a combined resistance total of 15Ω?

30Ω

1. Complete the following table assuming that the resistors are connected in parallel:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **R1** | **R2** | **R3** | **RT** |
| **a.** | 120Ω | 80Ω | - | 48Ω |
| **b.** | 16Ω | 48Ω | - | 12Ω |
| **c.** | 200Ω | 50Ω | - | 40Ω |
| **d.** | 40Ω | 40Ω | 20Ω | 10Ω |
| **e.** | 60Ω | 30Ω | 20Ω | 10Ω |



1. For the circuit opposite find…
2. the supply voltage V

324V

1. the current flowing in R1 and R3

Current in R1 = 27A

**V = ?**

Current in R3 = 36A

1. the value of R3

9Ω

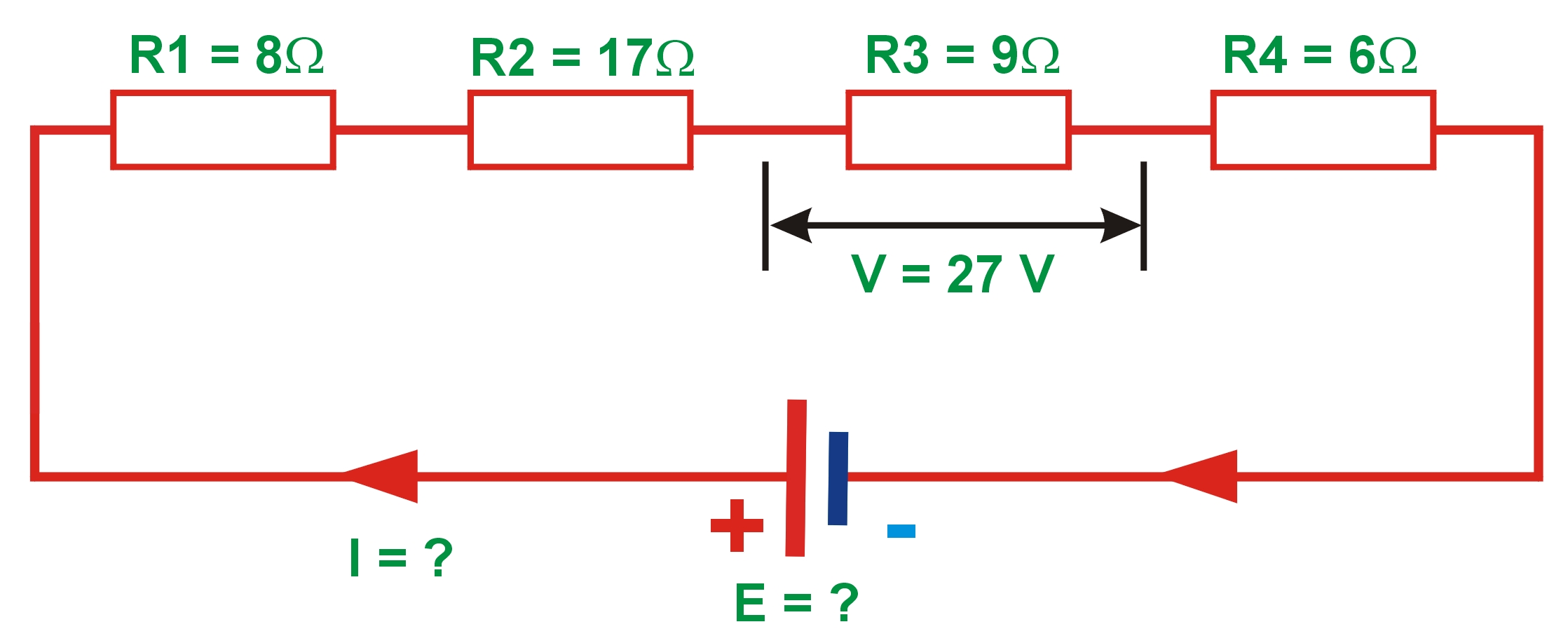
1. Calculate the value of resistor to be connected in series with two resistors each of 1.8Ω and 5.6Ω to give a total resistance of 10Ω.

2.6Ω

1. Six resistors of equal value are connected in series. Calculate the value of the individual resistors if the total resistance is 14.4Ω.

2.4Ω

1. For the circuit opposite find:



1. the total resistance

40Ω

1. the total current

**V = ?**

3A

1. the supply voltage V.

120V

1. Four resistors each of 5Ω, 20Ω, 45Ω & 10Ω are connected in series across a d.c. supply.   
   If the voltage across the resistors is 15, 60 & 135 volts respectively, calculate:
2. the voltage across the 10Ω resistor.

30V

1. the supply voltage.

240V