

**YEAR 10**

Electricity and Circuits

Three sections. Use $V = I \times R$, $Q = I \times t$ and $P = V \times I$. Show the formula, then the numbers, then the answer with its unit.

A. Calculations

- 1 A supply of 12V drives a current of 3A. Find the resistance. **4 ohms**
- 2 A supply of 24V drives a current of 8A. Find the resistance. **3 ohms**
- 3 A supply of 230V drives a current of 10A. Find the resistance. **23 ohms**
- 4 A supply of 9V drives a current of 3A. Find the resistance. **3 ohms**
- 5 A supply of 16V drives a current of 2A. Find the resistance. **8 ohms**
- 6 A current of 2A flows through a 6 ohm resistor. Find the voltage. **12V**
- 7 A current of 0.5A flows through a 20 ohm resistor. Find the voltage. **10V**
- 8 A current of 3A flows through a 4 ohm resistor. Find the voltage. **12V**
- 9 A charge of 20C passes in 5 seconds. Find the current. **4A**
- 10 A current of 4A flows for 30 seconds. Find the charge that passed. **120C**

B. Series and parallel

- 11 In a series circuit, what is true about the current at every point? **It is the same everywhere**
- 12 In a series circuit, what happens to the supply voltage? **It is shared between the components**
- 13 Two 4 ohm resistors are in series. Find the total resistance. **8 ohms**
- 14 Three 5 ohm resistors are in series. Find the total resistance. **15 ohms**
- 15 In a parallel circuit, what is true about the voltage across each branch? **It is the same as the supply voltage**

- 16 What happens to the total resistance when a second branch is added in parallel?
It goes down
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- 17 How must an ammeter be connected? **In series with the component**
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- 18 How must a voltmeter be connected? **In parallel with the component**
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- 19 One lamp in a series circuit breaks. What happens to the others, and why?
They all go out, because the circuit is broken and no current can flow
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C. Power and energy

- 20 A device runs at 12V and draws 2A. Find its power. **24W**
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- 21 A device runs at 230V and draws 9A. Find its power. **2070W**
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- 22 A device runs at 5V and draws 0.4A. Find its power. **2W**
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- 23 A device runs at 240V and draws 13A. Find its power. **3120W**
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- 24 A 60W bulb is on for 300 seconds. Find the energy transferred. **18000J**
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- 25 A 2000W oven runs for 1800 seconds. Find the energy transferred. **3600000J**
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- 26 How many watts are there in 2.5 kilowatts? **2500W**
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- 27 A 1200W microwave and a 500W television both run for one hour. Which uses more energy, and how many times more? **The microwave, 2.4 times more**
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