

Name _____

Class _____

Date _____

By the end of this worksheet I can...

- ☐ answer exam-style circuit questions under time pressure
- ☐ show working for every mark
- ☐ state formulae, units and circuit rules
- ☐ explain the effect of changing a resistance

I DO

Before you start 40 marks. Show all working.

V = IR

Voltage = current × resistance (Ohm's law)

- V in volts, I in amps, R in ohms (Ω)
- Convert first: 4.7 k Ω = 4700 Ω , 30 mA = 0.03 A

	Series	Parallel
Resistance	$R_T = R_1 + R_2 + \dots$	$1/R_T = 1/R_1 + 1/R_2 + \dots$ (two: $R_1 R_2 \div (R_1 + R_2)$)
Current	The same everywhere	Splits: $I_T = I_1 + I_2 + \dots$
Voltage	Shared: $V_S = V_1 + V_2 + \dots$	The same across every branch

YOU DO

Section 1: attempt all questions Total 40 marks.

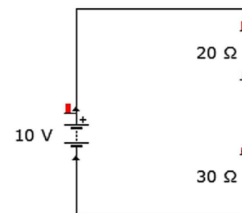
1 A 300 Ω resistor is connected to a 12 V supply.

a) Calculate the current through the resistor. (2 marks)

b) State the formula used. (1 mark)

c) State the unit of current. (1 mark)

2 $20\ \Omega$ and $30\ \Omega$ resistors are connected in series to a 10 V supply.

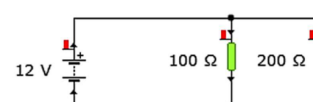


a) Calculate the total resistance. (1 mark)

b) Calculate the circuit current. (2 marks)

c) Calculate the voltage across the $30\ \Omega$ resistor. (3 marks)

3 $100\ \Omega$ and $200\ \Omega$ resistors are connected in parallel to a 12 V supply.

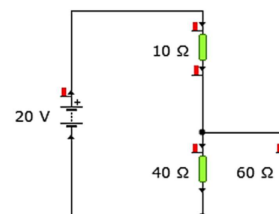


a) Calculate the total resistance. (3 marks)

b) Calculate the total circuit current. (2 marks)

c) State one characteristic of a parallel circuit. (1 mark)

4 A $10\ \Omega$ resistor is connected in series with $40\ \Omega$ and $60\ \Omega$ resistors in parallel. The supply is 20 V .

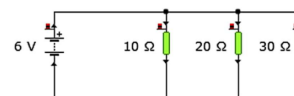


a) Calculate the resistance of the parallel section. (2 marks)

b) Calculate the total resistance. (1 mark)

c) Calculate the circuit current. (2 marks)

5 $10\ \Omega$, $20\ \Omega$ and $30\ \Omega$ resistors are connected in parallel to a 6 V supply.



a) Calculate the total resistance. (3 marks)

b) Calculate the current through the $10\ \Omega$ resistor. (2 marks)

6 A student needs $50\ \Omega$ but only has two $100\ \Omega$ resistors.

a) Draw a circuit to give $50\ \Omega$. (2 marks)

b) Prove by calculation that the total resistance is $50\ \Omega$. (2 marks)

7 A 6 V supply feeds a $15\ \Omega$ resistor in series with two $30\ \Omega$ resistors in parallel.

a) Calculate the total resistance. (2 marks)

b) Calculate the circuit current. (1 mark)

c) Calculate the voltage across the parallel section. (2 marks)

8 A 24 V supply is connected to a $2\text{ k}\Omega$ resistor.

a) Calculate the current in milliamps. (3 marks)

b) The resistor is replaced by a $1\text{ k}\Omega$ resistor. State what happens to the current and explain why. (2 marks)

Check and reflect

Mark your answers with the answer sheet. Which “I can” statement above still needs work? Look back at the notes for that topic on the site.
