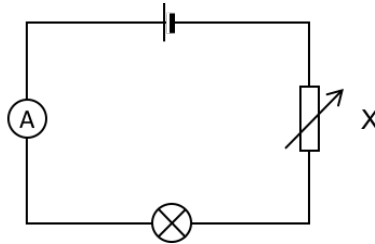


0	1
---	---

Pauline sets up the below circuit in order to investigate the electrical behaviour of a filament bulb. She wants to plot a graph of current against potential difference for the bulb.



0	1	.	1
---	---	---	---

One more component must be added to the circuit to enable her to plot a graph of current against voltage for the bulb. Add this component (using the appropriate circuit symbol) to the appropriate location in the diagram.

[2 marks]

0	1	.	2
---	---	---	---

Identify component X in the above circuit diagram.

Component X: _____

[1 mark]

0	1	.	3
---	---	---	---

Describe the steps which Pauline should follow to collect the data which she will need in order to plot a current-voltage graph for the bulb.

[3 marks]

0	1	.	4
---	---	---	---

When the p.d. across the bulb is 2 V, the current flowing through it is 1 A.
When the p.d. is 10 V, the current is 2 A.

Calculate the resistance of the bulb at each of these p.d. values.

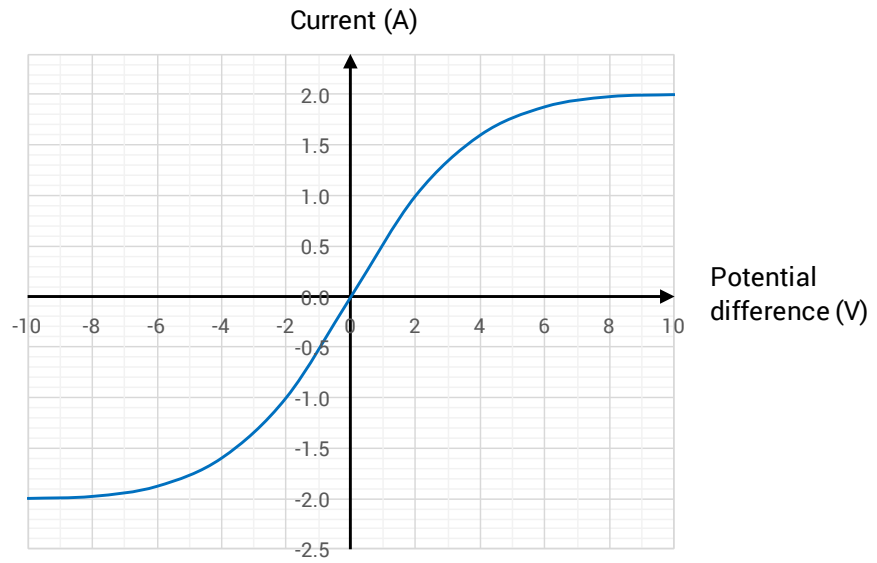
Resistance at 2 V = _____ Ω

Resistance at 10 V = _____ Ω

[2 marks]

0 1 . 5

Pauline plots the below graph from her experimental results.



On seeing the graph, Frank says that the bulb “clearly exhibits ohmic behaviour”. Do you agree with his statement? Explain your answer.

[2 marks]

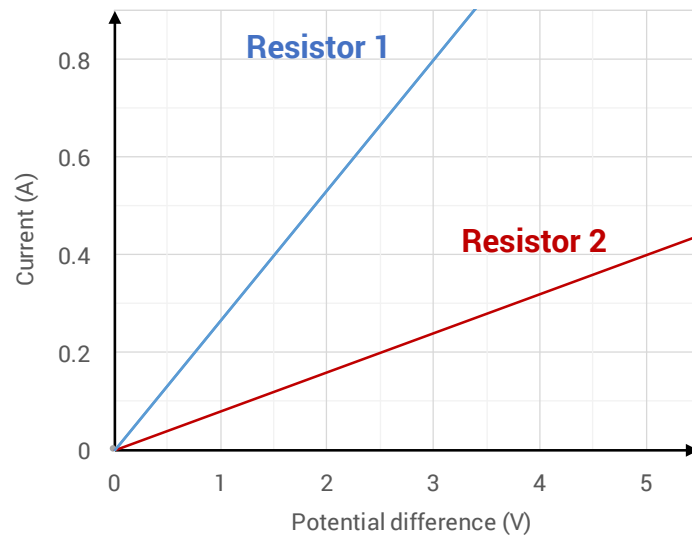
0 1 . 6

Explain the shape of the above graph for the filament bulb. Why does the current through the bulb depend on the p.d. across it in this way?

[3 marks]

0	2
---	---

The below graph shows the current-voltage characteristics of two different fixed resistors.



0	2	.	1
---	---	---	---

Calculate the resistance of both resistors.

Resistor 1 = _____ Ω

Resistor 2 = _____ Ω

[4 marks]

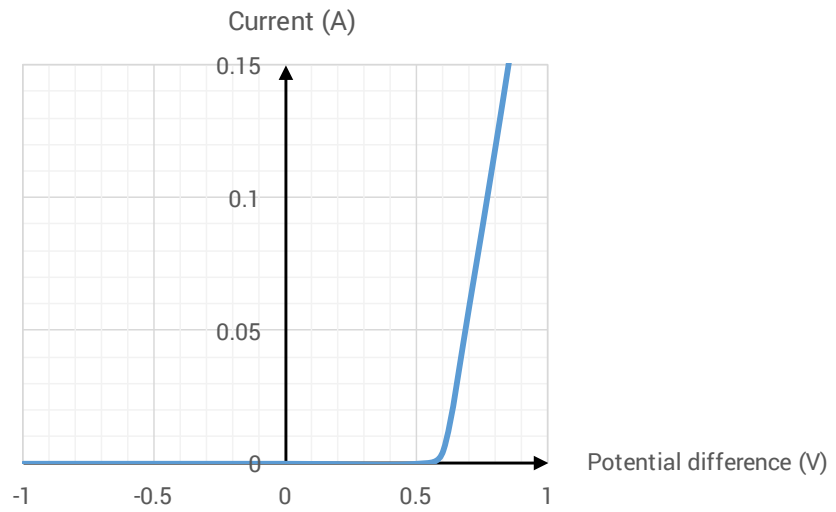
0	2	.	2
---	---	---	---

Both resistors may be described as being *ohmic*. Explain the meaning of this statement.

[3 marks]

0	3
---	---

The current-voltage graph for an electrical component is displayed below.



0	3
---	---

 .

1

What is the name of this component?

[1 mark]

0	3
---	---

 .

2

Draw a circuit diagram which could be used to obtain the data which was used to plot the above graph.

[3 marks]

0	3
---	---

 .

3

Describe a suitable method for collecting the current-voltage data from which the above graph was plotted.

[3 marks]