



Rewarding Learning

General Certificate of Secondary Education
2015

Centre Number

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Candidate Number

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Double Award Science: Physics

Unit P2

Foundation Tier

[GSD61]

FRIDAY 12 JUNE, AFTERNOON

GSD61



TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in blue or black ink only. **Do not write with a gel pen.**

Answer **all nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 90.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question **9**.



1 Static electricity can be very dangerous as well as being very useful.

(a) (i) State one danger of static electricity.

_____ [1]

(ii) State one use of static electricity.

_____ [1]

(b) A charge of 6 C passes through a resistor in 2 seconds.

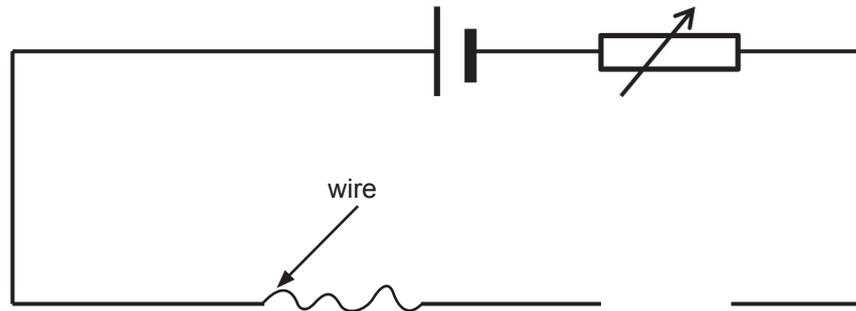
What current passes through the resistor?

You are advised to show your working out.

Current = _____ A [3]



(c) Shauna sets up a circuit to find the resistance of a length of wire.



(i) Complete the circuit diagram by adding an ammeter and voltmeter to enable Shauna to calculate the resistance of the wire. [3]

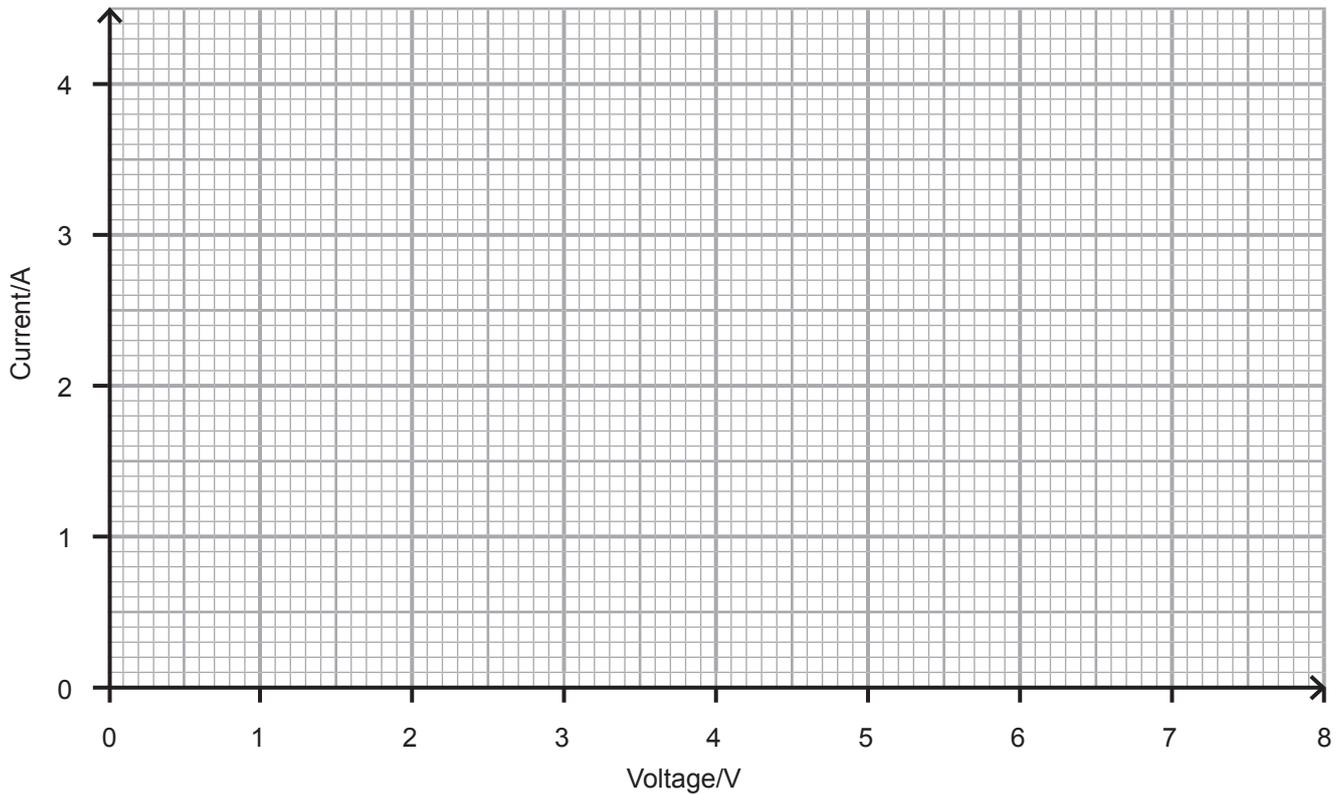
(ii) What precaution should Shauna take to be sure her results are reliable?

[1]



(d) Shauna obtained the following results.

Voltage/V	0	2	4	6	8
Current/A	0	1	2	3	4



(i) Plot the points on the grid.

[2]

(ii) Draw a straight line through the points.

[1]



(iii) Calculate the resistance of the piece of wire.

You are advised to show your working out.

Resistance = _____ Ω [3]

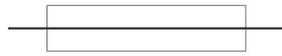
[Turn over



2 What is meant by each of the following symbols?

Write your answers in the space provided. One has been done for you as an example.

(a)



Fuse



[3]

In the diagram below cells are combined to form a battery. Each cell has a voltage of 1.5V.



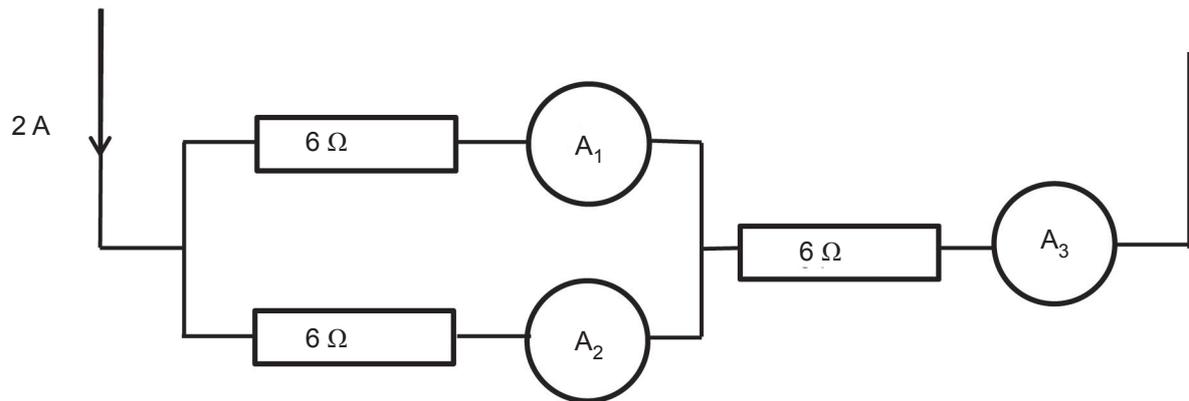
(b) (i) On the diagram mark the polarity of the battery in the boxes provided. [1]

(ii) What is the total voltage of the battery?

Voltage = _____ V [1]



The diagram below shows part of a circuit.



(c) State the readings on the three ammeters A_1 , A_2 and A_3 .

Reading on A_1 = ____ A Reading on A_2 = ____ A Reading on A_3 = ____ A

[3]

(d) (i) When we use electricity we pay for the number of units used.
Give another name for a 'unit of electricity'.

_____ [1]

(ii) An immersion heater, rated at 2.0 kW, is switched on for three hours.

How much will this cost if one unit of electricity costs 16 p?

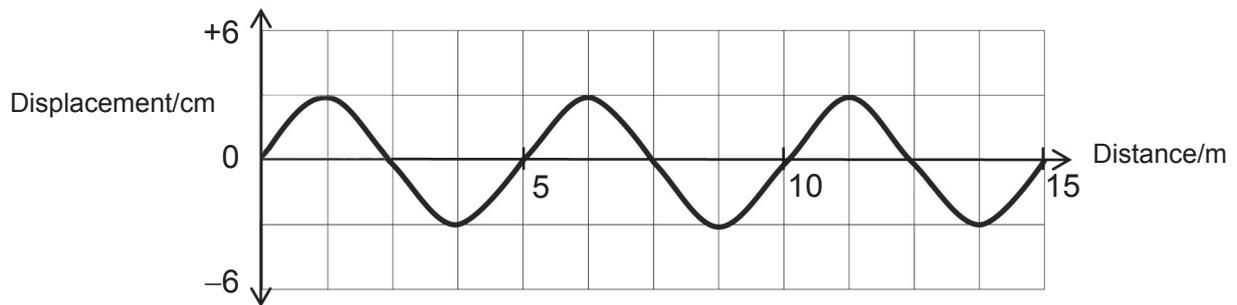
You are advised to show your working out.

Cost = _____ p [5]

[Turn over



3 The outline of a water wave is given below.



(i) What type of wave is a water wave?

Tick (✓) the appropriate box.

Transverse

Longitudinal

Electromagnetic

[1]

(ii) What do water waves transfer as they move along?

[1]

(iii) Use the graph to find the wavelength of the water wave.

Wavelength = _____ m [1]



(iv) The frequency of the wave is 2.0 Hz. Calculate the speed of the water waves.

You are advised to show your working out.

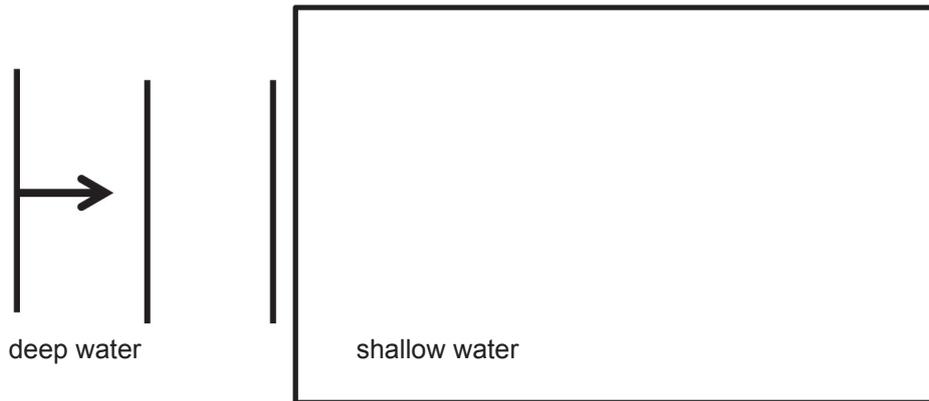
Speed = _____ m/s [3]

(v) Use the graph to find the amplitude of the water wave.

Amplitude = _____ cm [1]



4 The following diagram shows water waves entering shallow water.



(a) (i) Continue the waves in the shallow water by drawing three more waves. [3]

(ii) Is the speed of the waves in the shallow water greater than, less than or equal to the waves in the deep water?

Tick (✓) the appropriate box.

- greater than
- less than
- equal to

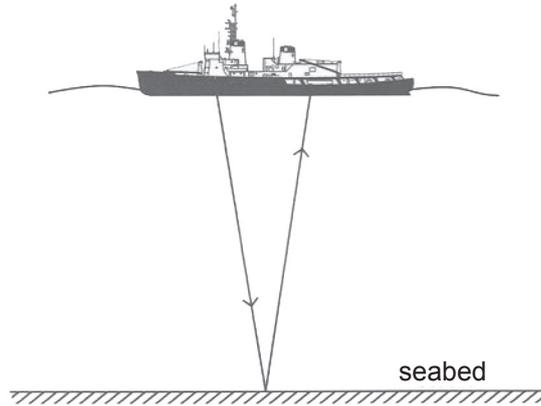
[1]



(b) Describe a medical use for ultrasound.

[1]

The speed of ultrasound waves in water is 1500 m/s. A ship sends out a pulse of ultrasound which is reflected from the seabed and is detected by the ship after 0.9 s.



(c) Calculate the distance from the ship to the seabed.

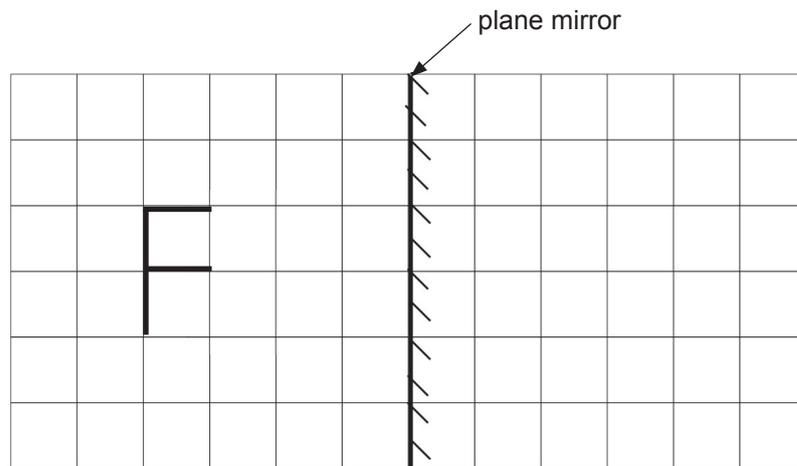
You are advised to show your working out.

Distance = _____ m [4]

[Turn over



- 5 The letter F is placed in front of a plane mirror.



- (a) (i) Draw the image of the letter F in the mirror.

[3]

The letter F is 0.4 m from the mirror. The mirror is moved 0.1 m to the right.

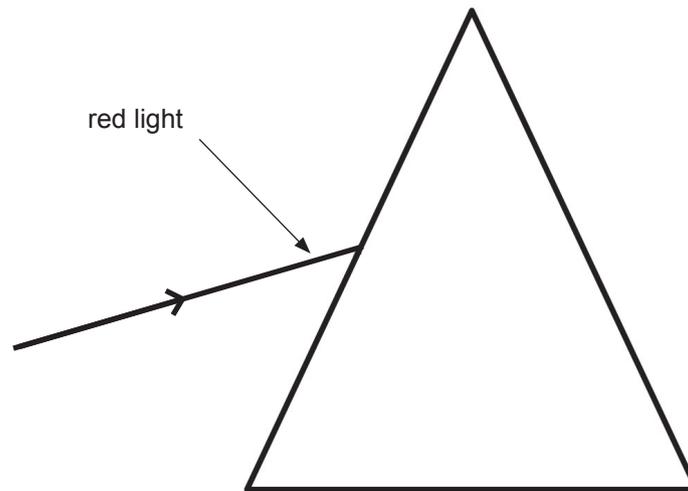
- (ii) How far is the letter F from its image?

You are advised to show your working out.

Distance = _____ m [2]



The diagram shows a ray of red light entering a glass prism.



(b) (i) Complete the path of the red ray through the glass and back into the air. [2]

(ii) Which colour is refracted most when **white** light is incident on the prism?

_____ [1]

(iii) Explain why different colours travel in different directions in the prism.

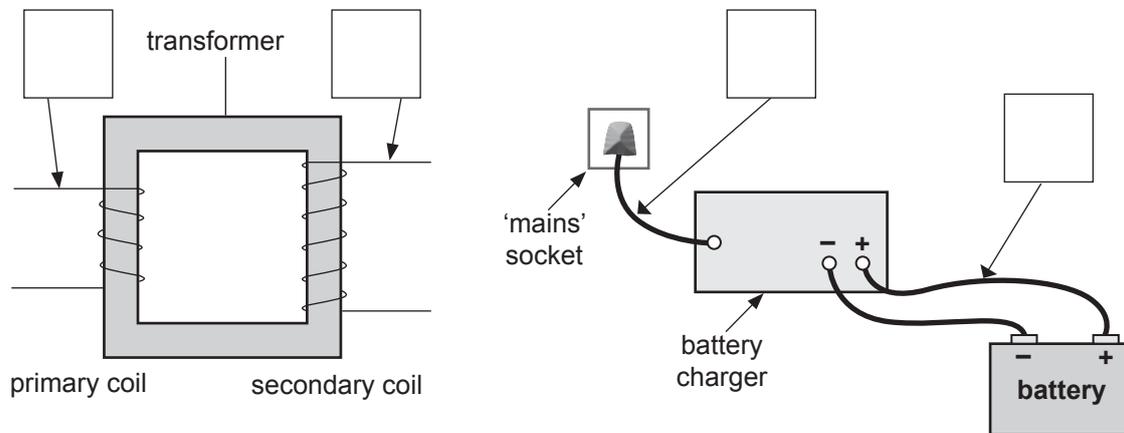
_____ [1]

[Turn over



6 Electricity can be either direct current (d.c.) or alternating current (a.c.).

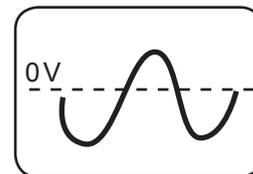
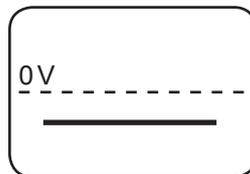
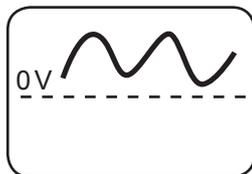
(a) (i) In the examples below, insert in the boxes, the letters d.c. or a.c. to indicate which type of electricity is flowing.



[4]

To test whether electricity is d.c. or a.c. we could connect the source to a cathode ray oscilloscope (CRO).

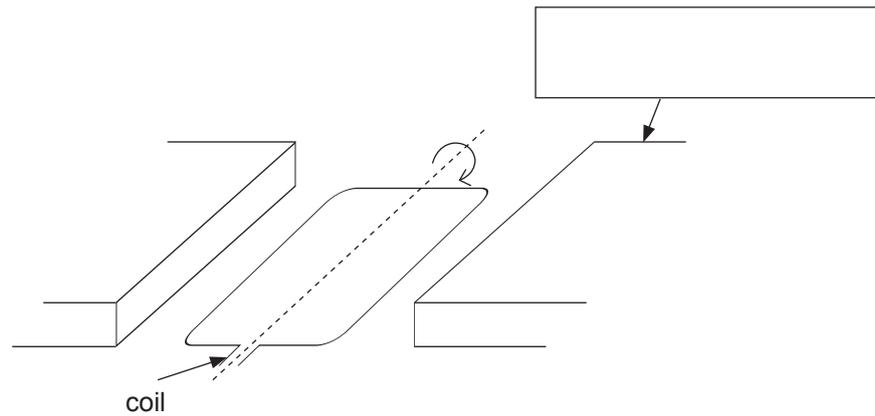
(ii) Under each diagram state whether the electricity is d.c. or a.c. The centre dotted line represents zero volts.



[3]



The diagram shows a simple a.c. generator.



(b) (i) One part has been labelled. Label the other part in the box. [1]

(ii) What physical principle does the a.c. generator depend on?

Tick (✓) the correct box.

Electromagnetic waves

Electromagnetic induction

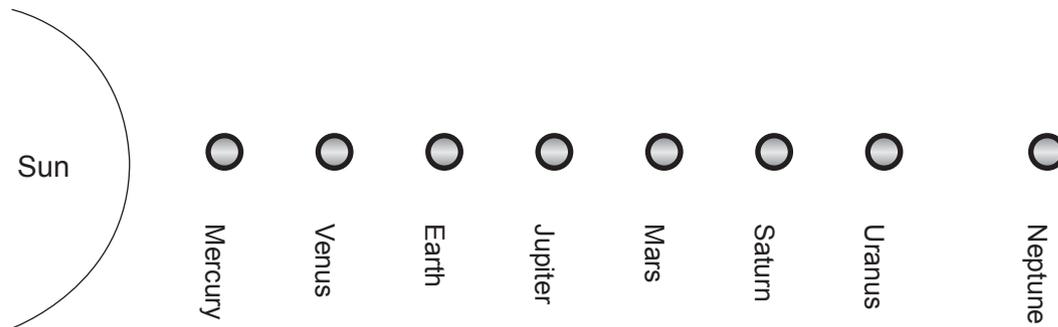
Electromagnetic spectrum

[1]

[Turn over



- 7 The diagram shows an **incorrect** view of the Sun and planets. The diagram is not to scale.



- (a) (i) Two planets are in the wrong positions.

Name these two planets.

_____ and _____

[2]

- (ii) Some planets are referred to as rocky planets and some as gas planets.

Give two examples of each.

Two rocky planets _____ and _____

Two gas planets _____ and _____

[4]

- (iii) Give the names of two bodies other than planets which orbit the Sun.

_____ and _____

[2]

- (iv) What force keeps the planets orbiting the Sun?

[1]



There are two models of the Solar System.

(b) (i) What is the name of the earlier model?

_____ [1]

(ii) What is at the centre of the Solar System in this earlier model?

_____ [1]

(iii) What is the name of the model with the Sun at the centre?

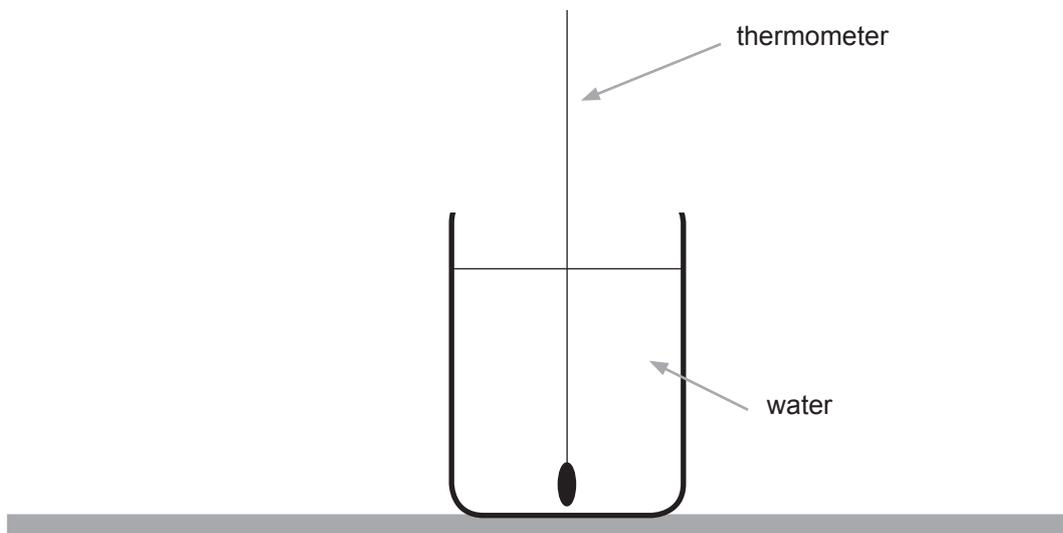
_____ [1]

[Turn over



8 Water is heated to 100 °C and then allowed to cool.

A thermometer allows the temperature of the water to be recorded every 5 minutes.



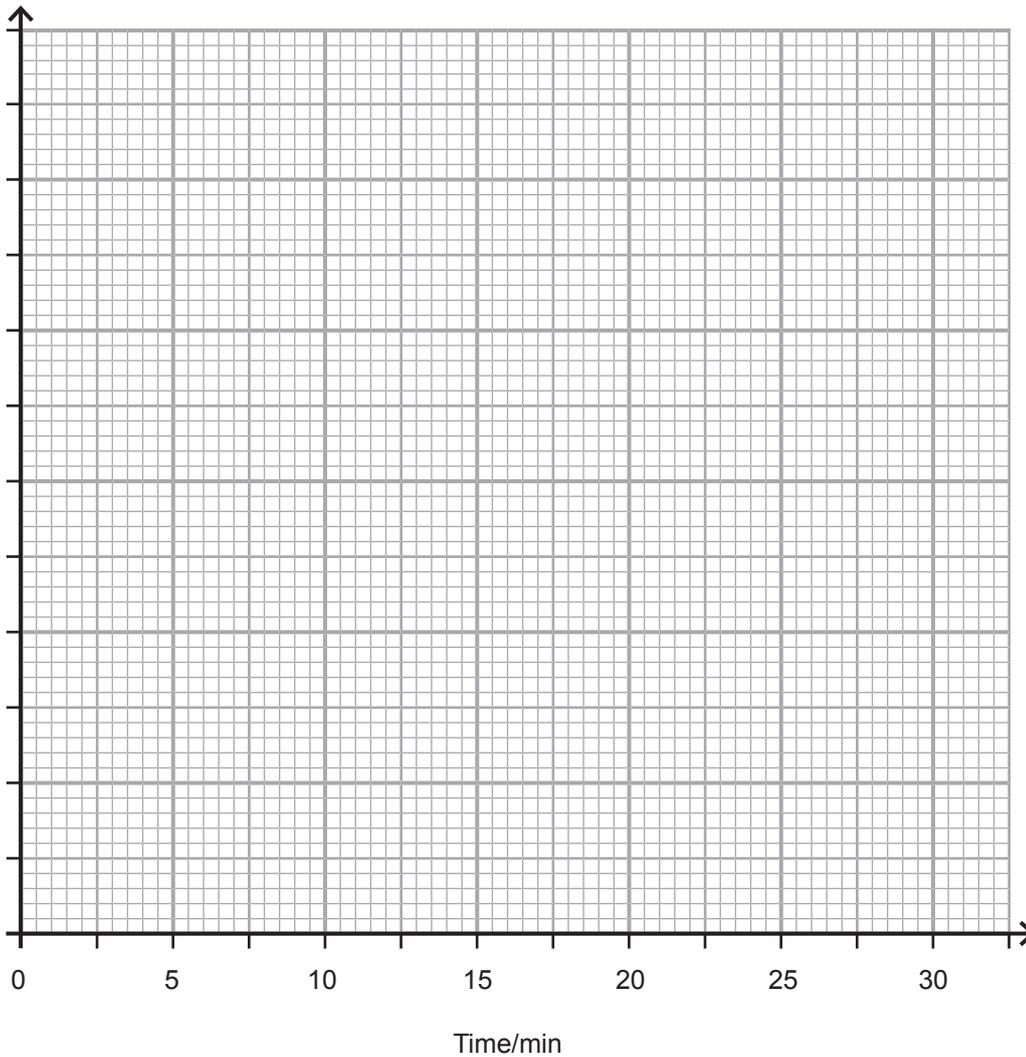
The table below shows the results of the experiment.

Temperature/°C	100	66	45	30	22	18	18
Time/min	0	5	10	15	20	25	30

You are asked to draw a graph of temperature against time for the cooling water.

- (i) Choose a suitable scale for the temperature and label it. [2]
- (ii) Plot the points on the grid. [2]
- (iii) Draw the best fit curve. [1]





(iv) Why do you think the last two readings of temperature are the same?

_____ [1]

(v) Describe fully how the temperature of the water changes with time.

_____ [2]

(vi) Use the graph to find the temperature of the water at 12 minutes.

_____ °C [1]

[Turn over





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Examiner Number

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