Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

PHYSICS **0625/51**

Paper 5 Practical Test **May/June 2025**

1 hour 15 minutes

You must answer on the question paper.

You will need: The materials and apparatus listed in the confidential instructions

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

For Examiner's Use	
1	
2	
3	
4	
Total	

This document has **12** pages. Any blank pages are indicated.

© UCLES 2025

1 In this experiment, you will determine the density of a ball.

(a) Place the ball between the two blocks as seen from above in Fig. 1.1.

View solution

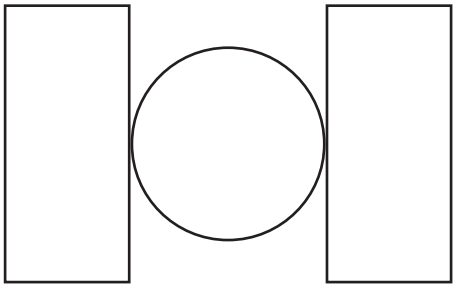


Fig. 1.1

(i) Describe how to use the apparatus in Fig. 1.1 to take **two** measurements to determine the diameter *d* of the ball. You may draw on Fig. 1.1 to help your description.

.....

.....

[2]

(ii) Using the blocks as shown in Fig. 1.1, take **two** measurements to determine the diameter *d* of the ball.

View solution

measurement 1 = ... cm

measurement 2 = ... cm

[1]

(iii) Use your measurements to calculate a value for the diameter *d* of the ball. Show your working.

View solution

d = ... cm [1]

(b) Calculate the volume *V* of the ball using the equation $V = 0.52d^3$.

View solution

Include the unit.

V = ... [2]

© UCLES 2025

(c) **(i)** Use the balance to measure the mass m_D of the dish provided.

View solution

m_D = ... g [1]

(ii) Place the ball in the dish and record the combined mass m_C of the dish and the ball.

View solution

m_C = ... g [1]

(iii) Calculate the mass m_B of the ball. Show your working.

View solution

m_B = ... g [1]

(d) Calculate the density ρ of the ball using the equation:

View solution

$$\rho = \frac{m_B}{V}.$$

Give your answer to a suitable number of significant figures for this experiment.

ρ = ... g / cm^3 [2]

[Total: 11]

© UCLES 2025

2 In this experiment, you will investigate the cooling of hot water in a beaker. Refer to Fig. 2.1.

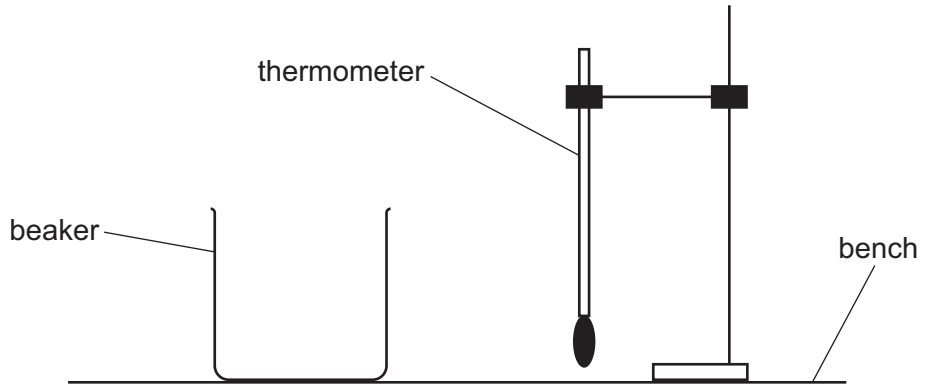


Fig. 2.1

View solution

(a) Use the thermometer to measure the temperature θ_R of the water in the container labelled 'cold water'.

θ_R = ... [1]

(b) **(i)** V is the total volume of water in beaker **A**.

View solution

Complete the column headings in Table 2.1.

Table 2.1

V/	θ/
100	
120	
140	
160	
180	
200	

[1]

(ii)
- Pour 100 cm^3 of hot water into beaker **A**.
- Place the thermometer in the hot water in beaker **A**.
- Record in Table 2.1 the temperature θ of the hot water.
- Without delay, use the measuring cylinder to add 20 cm^3 of the cold water to the water in beaker **A**.
- Stir the water in beaker **A**.
- Record in Table 2.1 the temperature of the mixture of hot and cold water.
- Repeat the procedure, adding 20 cm^3 of cold water each time, until you have a total of 200 cm^3 of water in beaker **A**.

View solution

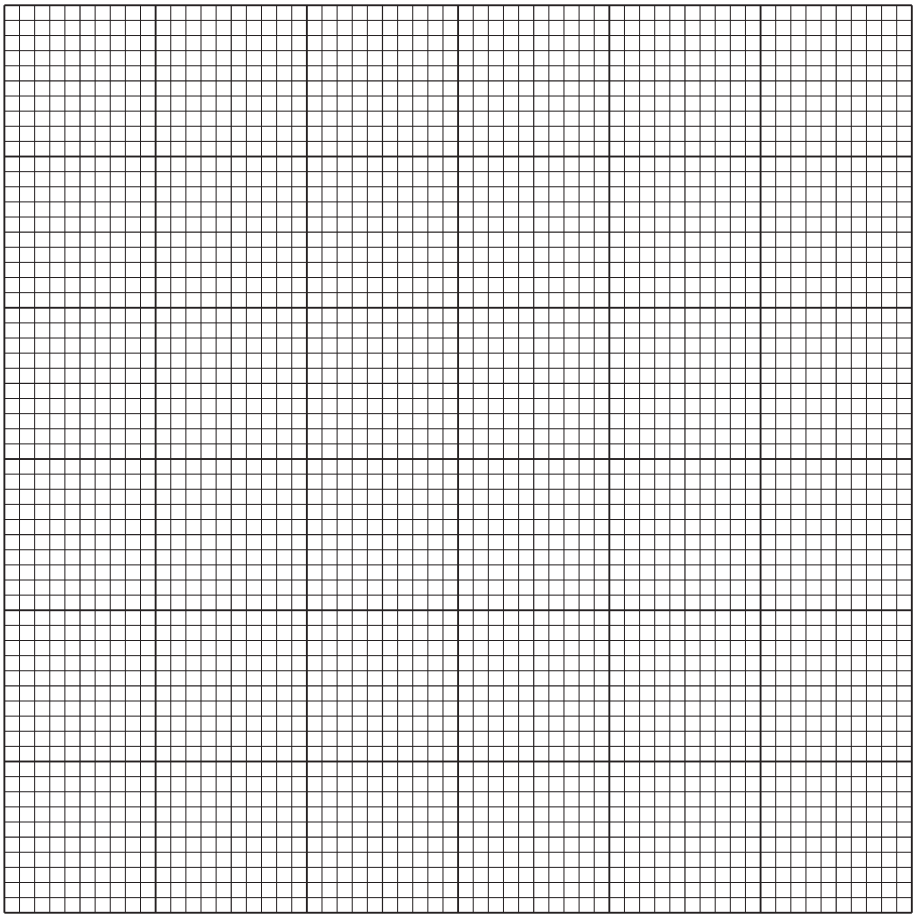
[3]

© UCLES 2025

(c) Plot a graph of temperature θ (y-axis) against total volume of water V (x-axis).
You do **not** need to start the axes at the origin $(0, 0)$.

View solution

Draw the best-fit curve.



[4]

(d) Suggest **two** ways to minimise the loss of thermal energy from the beaker during the experiment.

1 .....

.....

2 .....

.....

[2]

[Total: 11]

View solution

3 In this experiment, you will investigate the position of the image in a plane mirror.

Use the ray-trace sheet supplied, referring to Fig. 3.1 for guidance.

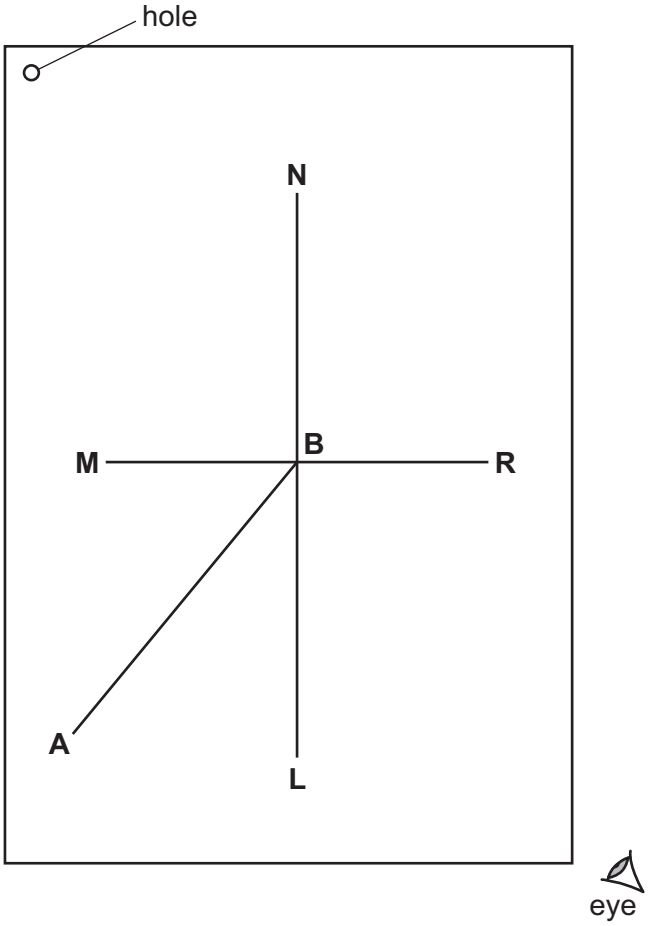


Fig. 3.1

(a)
- Draw a line 10.0 cm long near the middle of the ray-trace sheet. Label the line **MR**. Draw a normal to this line that passes through its centre. Label the normal **NL**. Label the point at which **NL** crosses **MR** with the letter **B**.
- Draw a line below **MR**, 10.0 cm long from **B** at an angle of incidence $i = 40°$ to the normal and to the left of the normal. Label the end of this line **A**.
- Place the reflecting face of the mirror vertically on the line **MR**.
- Place two pins, P_1 and P_2, on line **AB** at a suitable distance apart for this type of ray-trace experiment. Label the positions of P_1 and P_2.
- View the images of pins P_1 and P_2 from the direction indicated by the eye in Fig. 3.1. Place two pins, P_3 and P_4, so that pins P_3 and P_4 and the images of P_2 and P_1 all appear exactly one behind the other. Label the positions of P_3 and P_4.

[3]

View solution

(b) Remove the pins and the mirror. Draw a line through the positions of P_3 and P_4. Continue the line until it meets **MR**.

Measure the acute angle α between this line and the normal **NL**. An acute angle is an angle less than 90°.

View solution

α = ...° [1]

(c) Turn the ray-trace sheet through 180°. See Fig. 3.2.

View solution

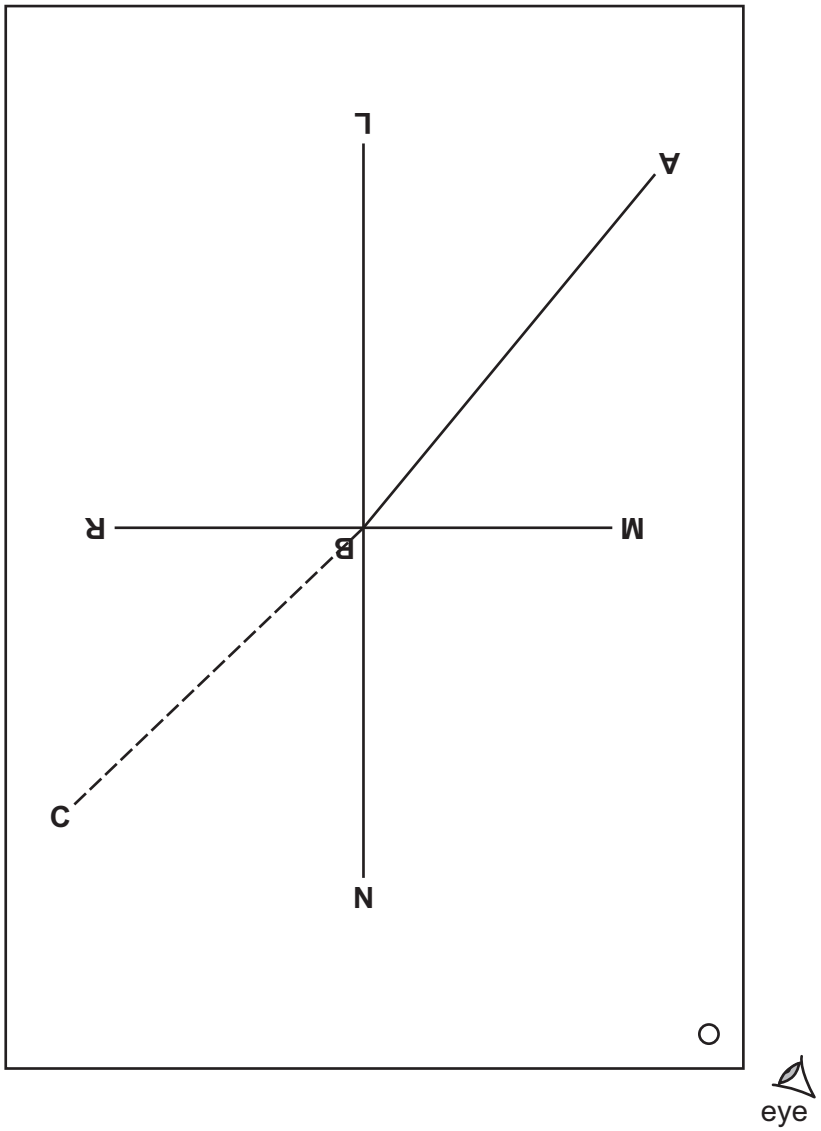


Fig. 3.2

- Draw a line below **MR**, 10.0 cm long from **B** at an angle of incidence i = 50° to the normal and to the left of the normal. Label the end of this line **C**.
- Place pins P_1 and P_2 on line **CB** at a suitable distance apart for this type of ray-trace experiment.
- Place the reflecting face of the mirror vertically on the line **MR** with the centre of the mirror at **B**.
- View the images of pins P_1 and P_2 from the direction indicated by the eye in Fig. 3.2.
- Place pins P_3 and P_4 so that pins P_3 and P_4 and the images of P_2 and P_1 all appear exactly one behind the other. Label the new positions of P_3 and P_4.

[2]

© UCLES 2025

(d) Remove the pins and the mirror.

Draw a line through the new positions of P_3 and P_4. Continue the line until it meets **NL**.

Measure the acute angle β between this line and the **horizontal** line **MR**.

β = ...° [1]

View solution

(e) Suggest a relationship between α and β. Justify your answer by reference to the results.

relationship .....

justification .....

.....

.....

[2]

View solution

(f) State **two** techniques that you use to obtain an accurate ray trace.

1 .....

.....

2 .....

.....

[2]

View solution

[Total: 11]

Write your name, centre number and candidate number on your ray-trace sheet.
Tie your ray-trace sheet into this question booklet between pages 8 and 9.

© UCLES 2025

BLANK PAGE

4 A student investigates the relationship between the diameter and the resistance of wires.

View solution

The following apparatus is available:

- wires with different diameters
- instrument for measuring the diameter of a wire
- metre ruler
- ammeter
- voltmeter
- power supply.

Other apparatus normally found in a school laboratory is also available.

Plan an experiment to investigate how the diameter of a wire affects its resistance.

Resistance R is given by the equation $R = \frac{V}{I}$, where V is the potential difference (p.d.) across the wire and I is the current in the wire.

You are **not** required to do this investigation. You do **not** need to write about safety precautions.

In your plan:

- draw a circuit diagram to show the circuit you use
- explain briefly how to do the investigation
- state **one** key variable to keep constant
- draw a table, or tables, with column headings, to display the readings (you are **not** required to enter any readings in the table)
- explain how to use your results to reach a conclusion.

© UCLES 2025

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [7]

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

© UCLES 2025