



Please write clearly in block capitals.

Centre number

Candidate number

Surname \_\_\_\_\_

Forename(s) \_\_\_\_\_

Candidate signature \_\_\_\_\_

I declare this is my own work.

# GCSE MATHEMATICS

# H

Higher Tier Paper 2 Calculator

Monday 3 June 2024

Morning

Time allowed: 1 hour 30 minutes

### Materials

For this paper you must have:

- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).



### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24	
<b>TOTAL</b>	

### Advice

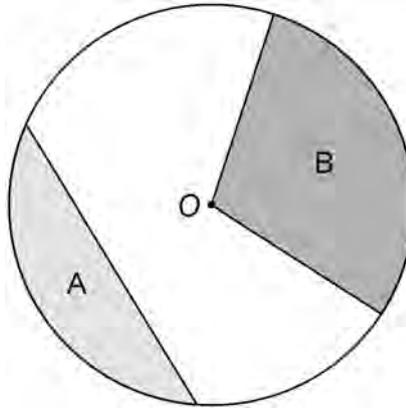
In all calculations, show clearly how you work out your answer.



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Answer **all** questions in the spaces provided.

- 1 The diagram shows a circle, centre  $O$ , and three straight lines.



Use **one** word to describe each shaded region.

Choose from

arc    chord    sector    segment    tangent

[2 marks]

Region A \_\_\_\_\_

Region B \_\_\_\_\_



2

The mass of an iceberg is 2 200 000 kg

This value is a 12% reduction from the **original** mass of the iceberg.

Work out the **original** mass of the iceberg.

Give your answer in standard form.

**[3 marks]**

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Answer \_\_\_\_\_ kg

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**Turn over for the next question**

5

**Turn over ►**

- 3** A chef has a tub of blueberries.  
She wants to  
use all the blueberries  
put the same number of blueberries on each dessert.

$$D = \frac{k}{b}$$

$D$  is the number of desserts.

$b$  is the number of blueberries on each dessert.

- 3 (a)** What does the constant  $k$  represent?

Tick the correct box.

[1 mark]

The number of blueberries in the tub.

The number of desserts

The number of blueberries on each dessert

None of the above

- 3 (b)** Complete the table.

[2 marks]

$b$	2	6	
$D$	120		30

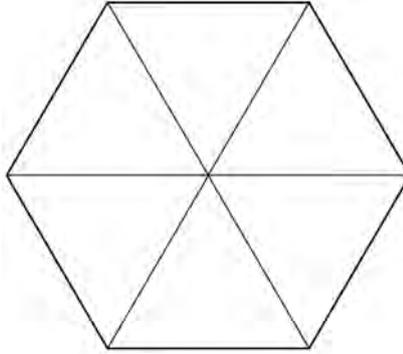


- 4 (a) A fair spinner has six equal sections, each with the number 5, 6, 7 or 8  
Each number appears at least once.  
 $P(\text{even number}) = P(7)$

Work out  $P(5)$

You may use the blank spinner to help you.

[3 marks]



Answer \_\_\_\_\_

- 4 (b) A different spinner has ten sections, each labelled A, B, C or D.

	A	B	C	D
Probability	0.1	0.5	0.2	0.3

Give **one** reason why there **must** be a mistake in the table.

[1 mark]

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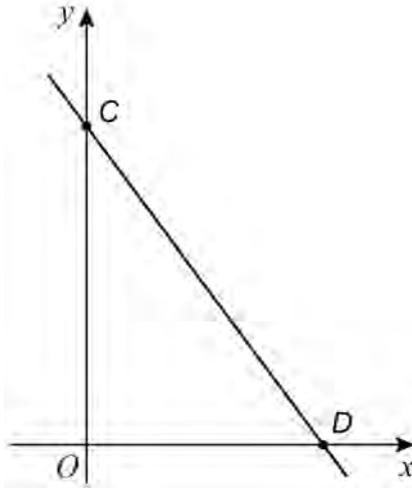
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- 5 (a) Here is a sketch of the graph  $y = -2x + 6$

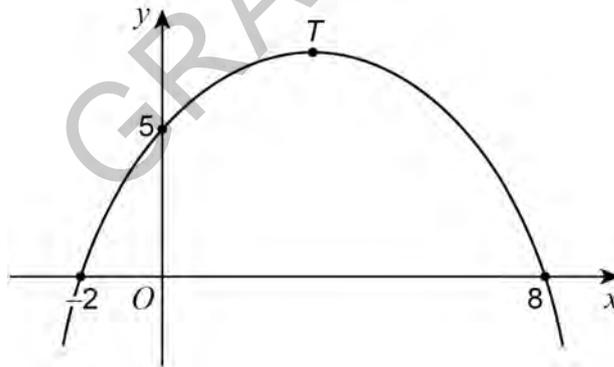


Complete the coordinates of  $C$  and  $D$ .

[2 marks]

$C(0, \quad)$   $D(\quad, 0)$

- 5 (b) Here is a sketch of a quadratic graph.



Complete the following statements.

[2 marks]

The value of the **y-intercept** is \_\_\_\_\_

The **x-coordinate** of the turning point,  $T$ , is \_\_\_\_\_



- 6 Work out  $(2.5 \times 10^4)^{-3}$   
Give your answer in standard form.

[1 mark]

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Answer \_\_\_\_\_

- 7 Archie flips a biased coin 200 times.  
Here is some information about the outcomes after each 50 flips.

<b>Total number of flips</b>	50	100	150	200
<b>Number of heads</b>	10	27	37	52

Work out the best estimate for the probability of flipping a head.  
Give a reason for your answer.

[2 marks]

Answer \_\_\_\_\_

Reason \_\_\_\_\_

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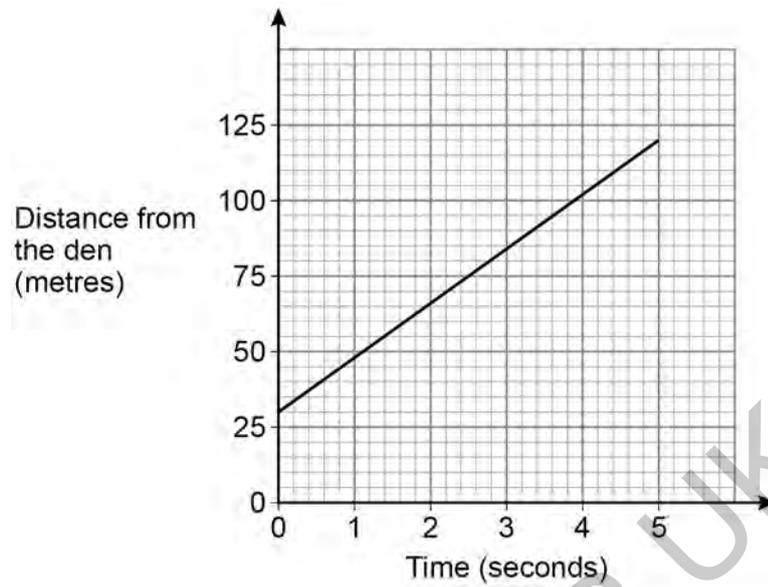
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8

A lion is sprinting in a straight line away from its den.

The graph shows the lion's distance from the den.



Work out the speed of the lion in metres per second.

[3 marks]

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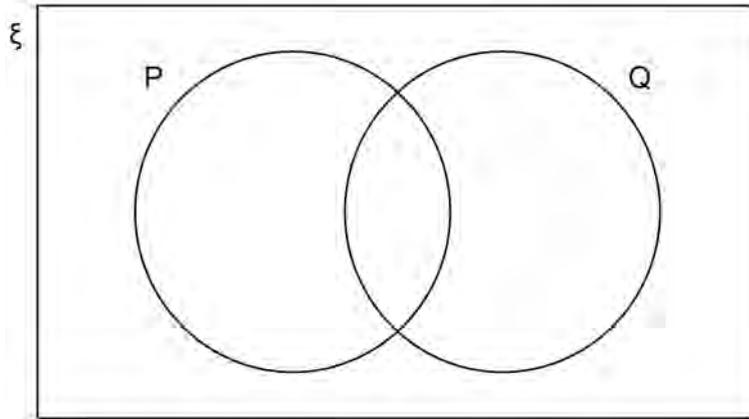
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Answer \_\_\_\_\_ m/s



- 9 On the Venn diagram, shade the section represented by  $P \cap Q$

[1 mark]



- 10 A bus route had 90 000 passengers last year.  
The number of passengers was predicted to increase  
by 3% this year  
and then  
by 8% next year.
- Is the predicted number of passengers for **next** year more than 100 000 ?  
You **must** show your working.

[3 marks]

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Turn over ►



- 11 A map has a scale of 1 : 20 000  
Two churches are 15 cm apart on the map.  
Work out the actual distance between them.  
Give your answer in **kilometres**.

[3 marks]

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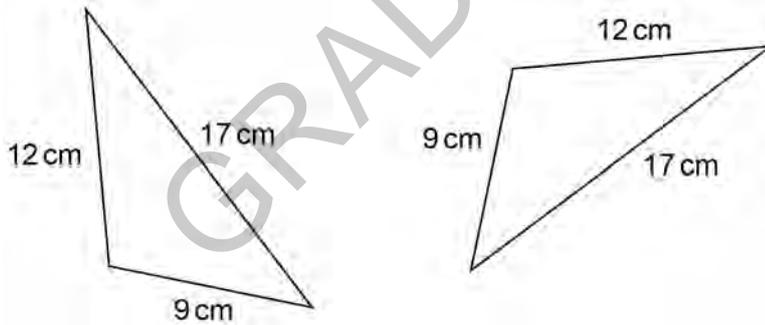
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Answer \_\_\_\_\_ km

12

Not drawn  
accurately

Circle the reason why these triangles are congruent.

[1 mark]

ASA

RHS

SAS

SSS



13

Liam takes part in long jump competitions.

Here is some information about 40 of his jumps.

Length of jump, $d$ metres	Number of jumps	Midpoint	
$7.0 \leq d < 7.4$	15		
$7.4 \leq d < 7.8$	18		
$7.8 \leq d < 8.2$	7		
Total = 40			

Work out an estimate of the mean distance of these 40 jumps.

Give your answer as a decimal.

**[3 marks]**


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Answer \_\_\_\_\_ m

7

Turn over ►







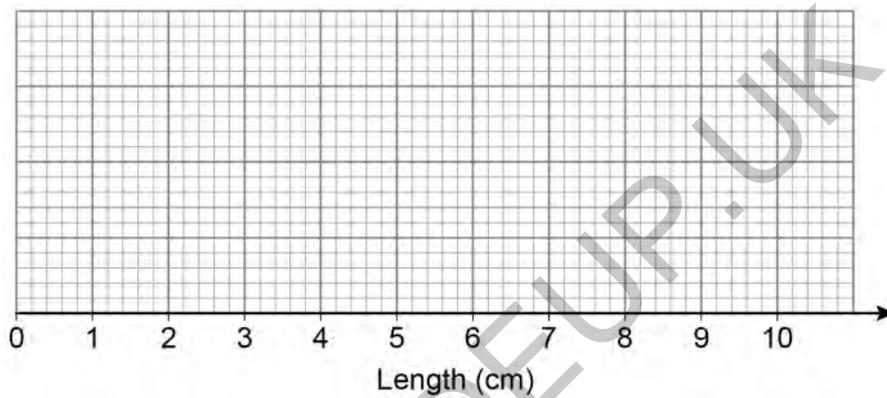
16

Here is some information about the lengths, in cm, of leaves.

- Shortest length = 2.4
- Longest length = 9
- Upper quartile = 7
- Median length = 6
- Interquartile range = 3

Draw a box plot to show this information.

[3 marks]





- 18** A diagonal of a rectangle is 23.7 cm long.  
The diagonal makes an angle of  $52^\circ$  with a side of length  $x$  cm  
Work out the value of  $x$ . **[3 marks]**

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$x =$  \_\_\_\_\_

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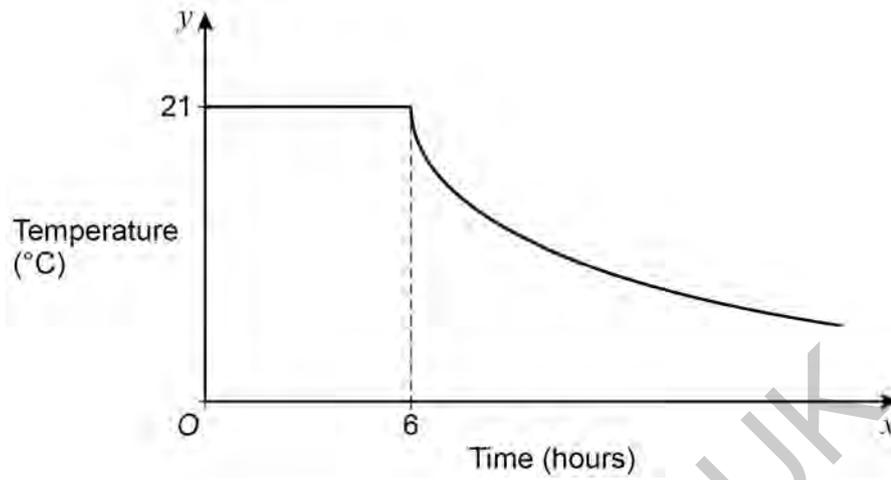


24

A room is kept at a constant temperature of  $21^{\circ}\text{C}$  for 6 hours.

The heating is then turned off and the room begins to cool.

Here is a sketch graph showing the temperature,  $y^{\circ}\text{C}$ , of the room at time  $x$  hours.



24 (a)

Assume the equation of the curved part is  $y = \frac{k}{x}$  where  $k$  is a constant.

Work out the value of  $y$  when  $x = 12$

**[2 marks]**


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$y =$  \_\_\_\_\_



**24 (b)** In fact,

the equation of the curved part is  $y = A \times \left(\frac{1}{3}\right)^{\frac{1}{6}x}$  where  $A$  is a **different** constant.

How does this affect the value of  $y$  when  $x = 12$  ?

Tick **one** box.

You **must** show working to support your answer.

**[2 marks]**

The value of  $y$  is greater than the answer to part (a).

The value of  $y$  is less than the answer to part (a).

The value of  $y$  is the same as the answer to part (a).

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**Turn over for the next question**

**Turn over ►**





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*Do not write  
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ANSWER IN THE SPACES PROVIDED**

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