

AQA • GCSE MATHEMATICS 8300

Higher Tier — Paper 1

Non-Calculator

June 2025 exam series

QUESTION PAPER

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Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

GCSE MATHEMATICS

H

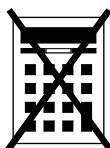
Higher Tier Paper 1 Non-Calculator

Thursday 15 May 2025 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- mathematical instruments
- the Formulae Sheet (enclosed).



You must **not** use a calculator.

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.

Advice

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

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

TOTAL



J U N 2 5 8 3 0 0 1 H 0 1

Answer **all** questions in the spaces provided.**1** Solve the simultaneous equations

$$2x + 5y = 18$$

$$2x + y = 6$$

[3 marks]

$$x = \quad \quad \quad y = \quad \quad \quad$$

2 $1.07 < \frac{x}{9} < 1.17$ where x is an **integer**.Work out the value of x .**[2 marks]**

$$x = \quad \quad \quad$$



3

A metal solid has volume 11 cm^3 The density of the metal is 8.5 g/cm^3

Work out the mass of the solid.

[2 marks]

Answer _____ g

4

Here are 11 numbers.

2 8 10 12 12 14 19 23 26 31 33

Work out the inter-quartile range.

[2 marks]

Answer _____



5

The table shows information about the marks of students in a test.

	Mean mark	Range of marks
School A	61	14
School B	56	21

Tick **one** box for each statement.

[3 marks]

	True	May be true	Not true
On average, School A had higher marks	☐	☐	☐
There are more students in School B	☐	☐	☐
School B had a greater spread of marks	☐	☐	☐



- 6 (a)** Work out $0.6 \div 100$
Give your answer in standard form.

[2 marks]

Answer _____

- 6 (b)** Work out $40 \times 30 \times 10^5$
Give your answer in standard form.

[2 marks]

Answer _____

Turn over for the next question**Turn over ►**

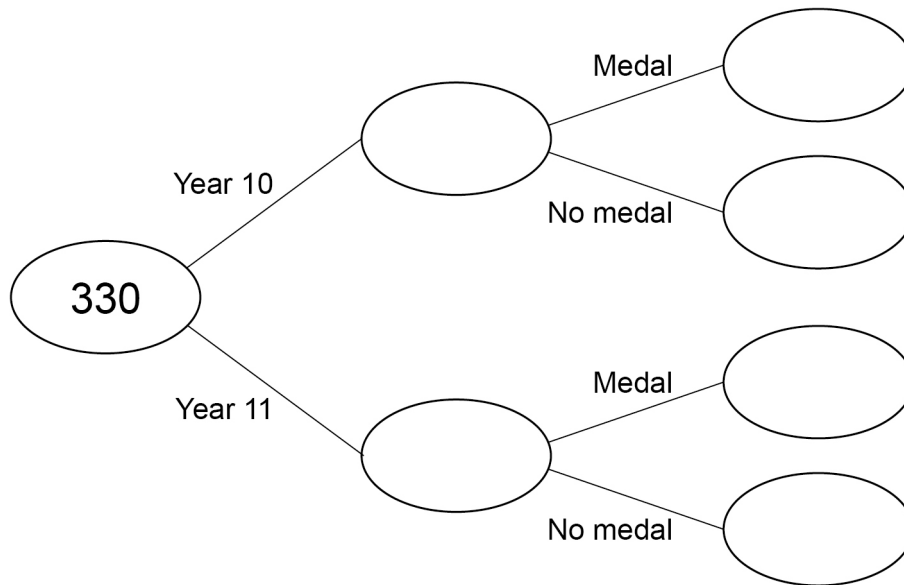
7

330 students from Year 10 and Year 11 take part in a competition.

- number of students in Year 10 : number of students in Year 11 = 1 : 2
- 125 students win a medal.
- 73 of the students who win a medal are in Year 11

Complete the frequency tree.

[4 marks]





8

Work out $\frac{4}{15} + \frac{1}{5} \div \frac{1}{2}$

Give your answer as a fraction.

[3 marks]

Answer _____

Turn over for the next question

7

Turn over ►



9

$$y = \frac{1}{x}$$

Which of these values of x gives the **greatest** value of y ?

Circle your answer.

[1 mark]

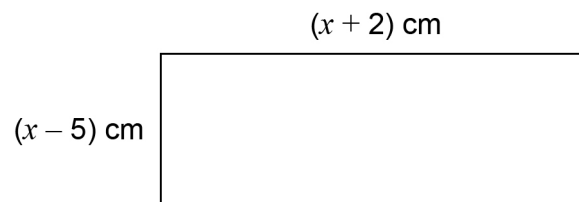
$$\frac{9}{20}$$

$$\frac{2}{5}$$

-80

95

10



Not drawn
accurately

The area of the rectangle is 120 cm^2

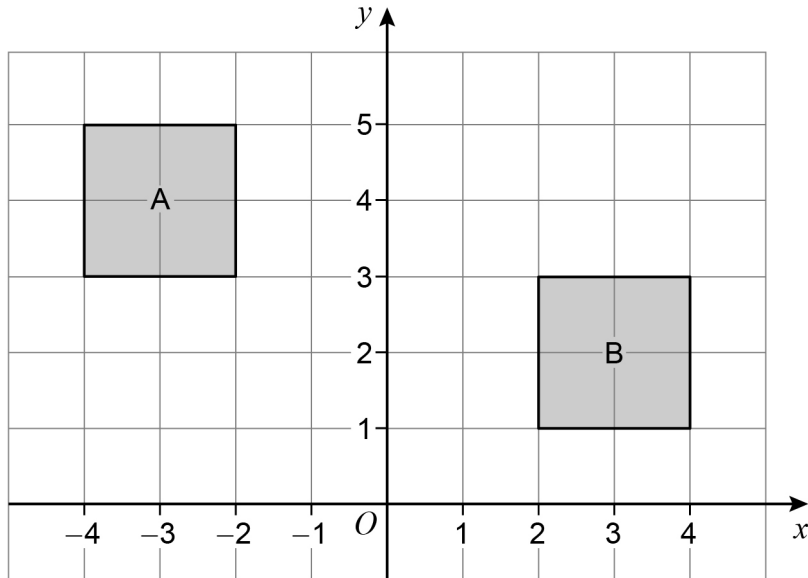
Work out the value of x .

[4 marks]

$x =$ _____



11



- 11 (a) Write down the **translation vector** that maps shape A to shape B.

[1 mark]

Answer $\left(\begin{array}{c} \\ \end{array} \right)$

- 11 (b) Describe fully a **rotation** that maps A to B.

[2 marks]

Turn over ►



12

Oscar and Nikita share some money in the ratio 8 : 5

Oscar has £27 **more** than Nikita.

How much do they have altogether?

[3 marks]

Answer £ _____

13

c and d are **consecutive cube numbers**, where $c < 4.5^3 < d$

Work out the value of $d - c$

[2 marks]

Answer _____



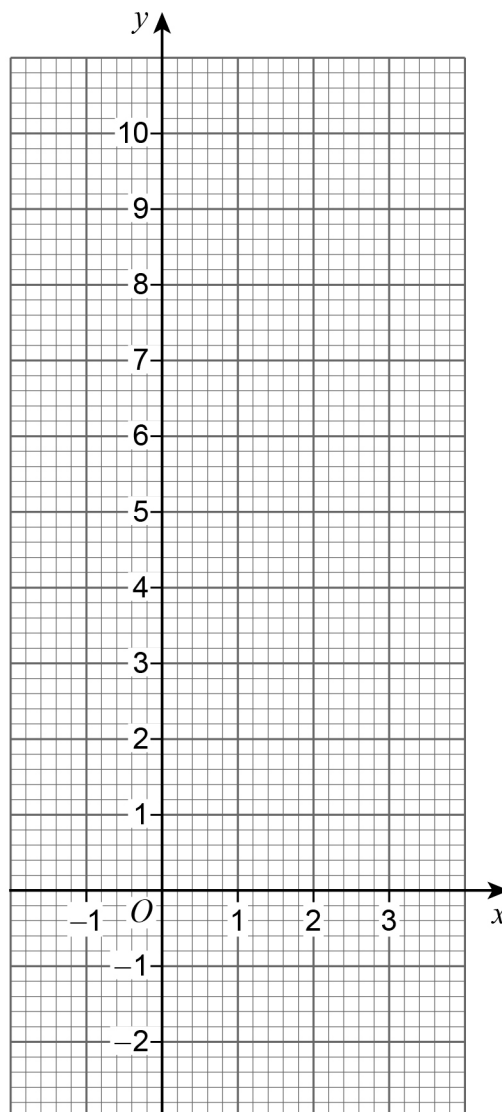
14 (a) Complete the table of values for $y = 2^x$

[2 marks]

x	-1	0	1	2	3
y		1		4	

14 (b) Draw the graph of $y = 2^x$ for values of x from -1 to 3

[2 marks]



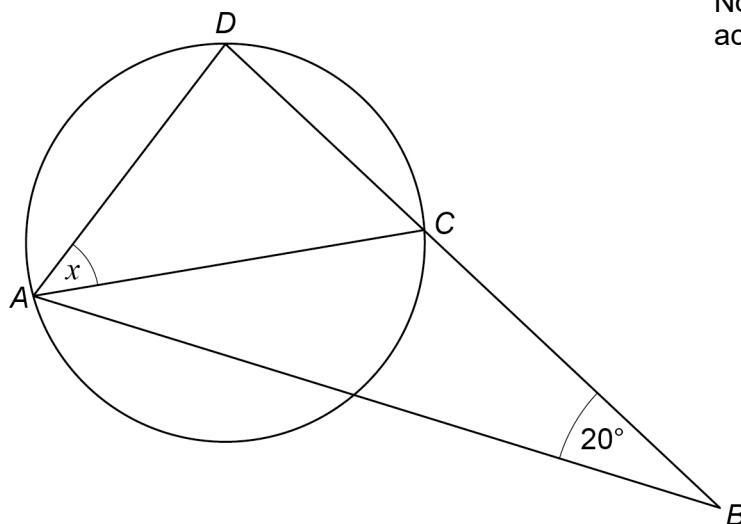
15

A , C and D are points on a circle, diameter AC .

ABC is an isosceles triangle with $AC = BC$

BCD is a straight line.

Not drawn
accurately



Work out the size of angle x .

[4 marks]

$x =$ _____ $^\circ$



16

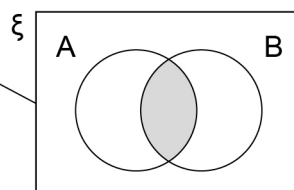
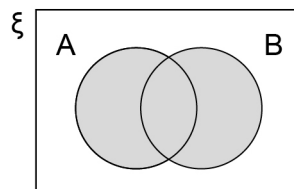
A and B are two events.

Match each box on the left to the correct **shaded** area on the Venn diagrams.

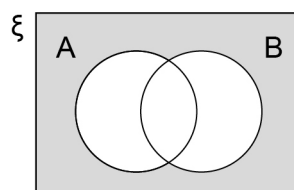
One has been done for you.

[3 marks]

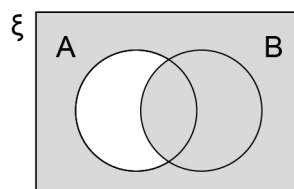
$$A \cap B$$



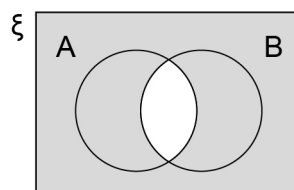
$$A \cup B$$



$$A' \cup B$$



$$A' \cap B'$$



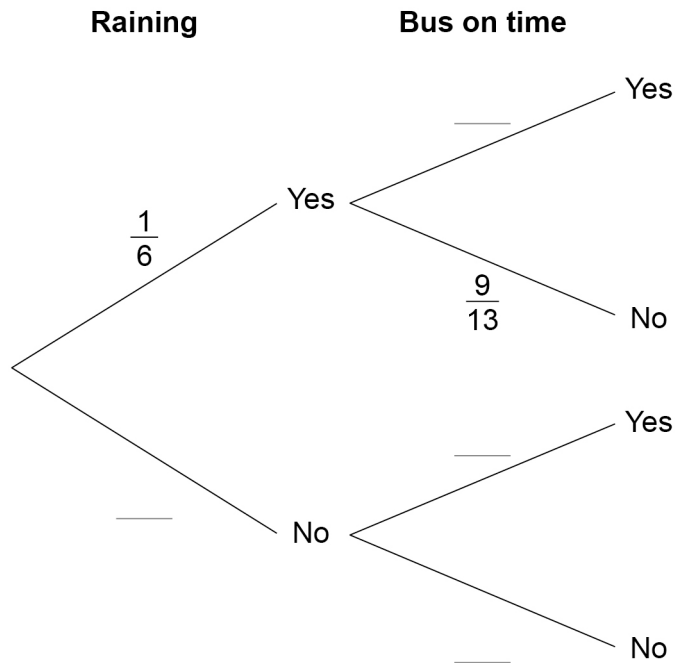
Turn over ►



- 17** A bus is due to arrive at a bus stop at 1 pm
The probability that the bus is on time is **halved** when it is raining.

17 (a) Complete the tree diagram.

[2 marks]



- 17 (b)** Work out the probability that at 1 pm it is raining and the bus is **not** on time.

[2 marks]

Answer _____



Show that $\frac{\sin 30^\circ \times \cos 45^\circ}{\tan 60^\circ}$ can be written in the form $\frac{\sqrt{a}}{b}$

[3 marks]

7



19 (a) Work out the value of $\left(\frac{9}{16}\right)^{-\frac{3}{2}}$

[3 marks]

Answer _____

19 (b) $\sqrt{125} = 5^n$

Work out the value of n .

[2 marks]

$n =$ _____



20

Express $\sqrt{44} + \sqrt{99} + \sqrt{275}$ in the form $a\sqrt{n}$ where a and n are integers.

[3 marks]

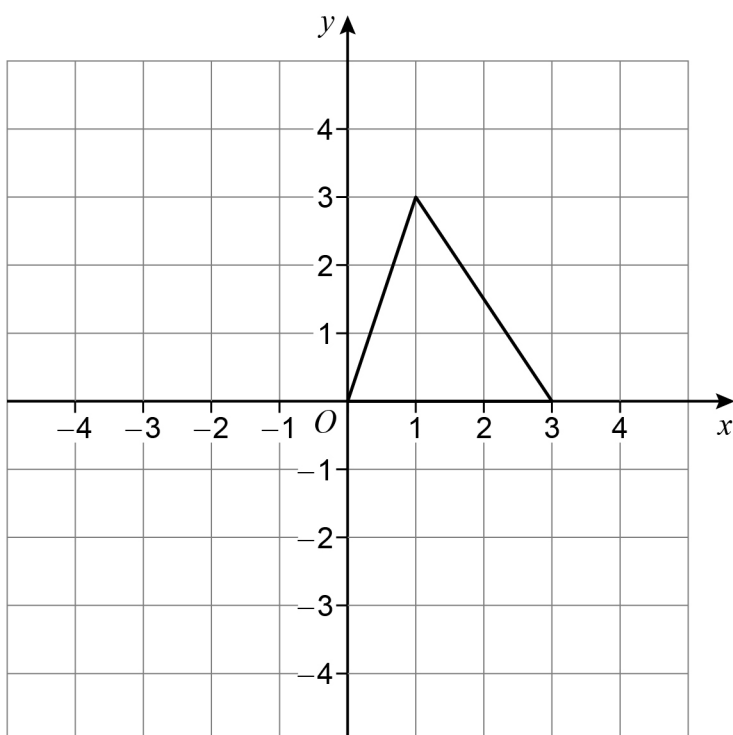
Answer _____

Turn over for the next question

Turn over ►

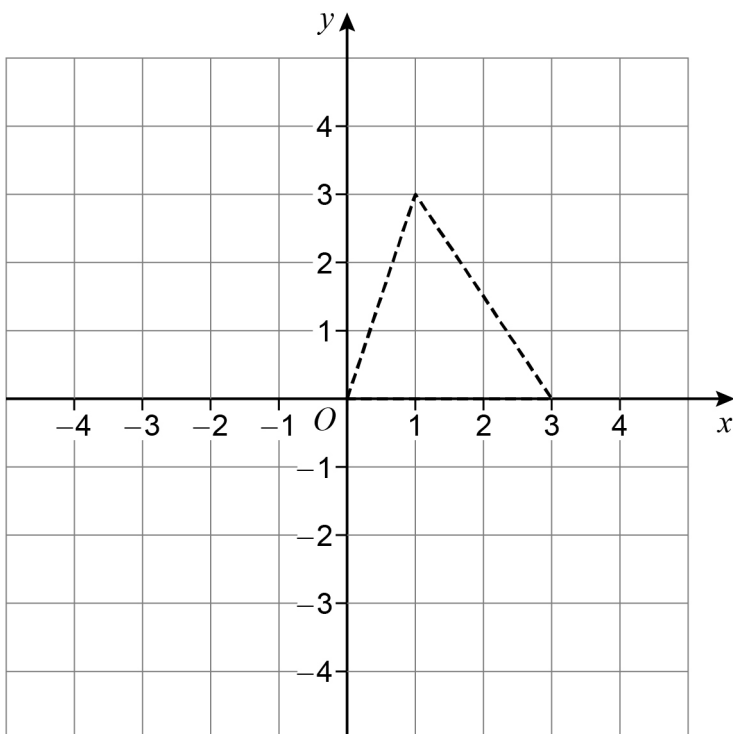


- 21** The graph of $y = f(x)$ for $0 \leq x \leq 3$ is shown.

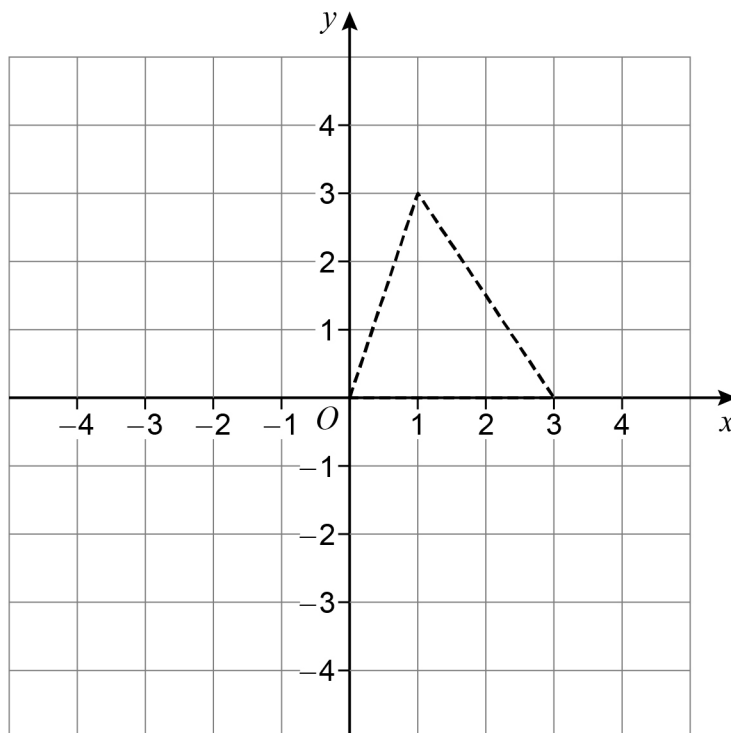


- 21 (a)** On the grid below, draw the graph of $y = -f(x)$ for $0 \leq x \leq 3$.
The graph of $y = f(x)$ is shown to help you.

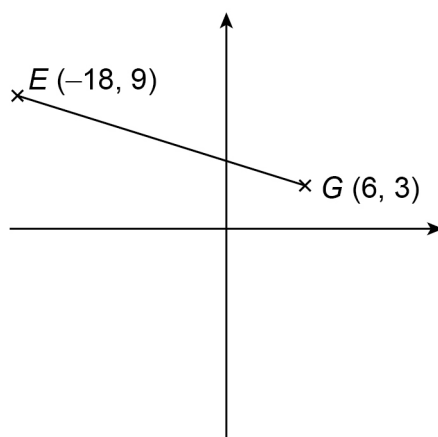
[1 mark]



- 21 (b)** On the grid below, draw the graph of $y = f(x) + 1$ for $0 \leq x \leq 3$
The graph of $y = f(x)$ is shown to help you.

[1 mark]**Turn over for the next question****Turn over ►**

22

Here is a sketch of straight line EG .

F is a point on EG such that $EF = \frac{1}{3} EG$

Work out the coordinates of F .

[3 marks]

Answer (_____ , _____)



23 (a) Write $x^2 + 12x + 50$ in the form $(x + a)^2 + b$ where a and b are integers.

[2 marks]

Answer _____

23 (b) A curve has the equation $y = (x - 3)^2 - 8$

Write down the coordinates of the turning point of the curve.

[2 marks]

Answer (_____ , _____)

Turn over for the next question

Turn over ►



Prove that

can never be positive.



6 of the counters are black.

The probability that **both** counters are black is $\frac{1}{8}$

Use an algebraic method to work out the value of n .

[5 marks]

$$n =$$

END OF QUESTIONS

C



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2 8



2 5 6 6 8 3 0 0 / 1 H