AQA

2023 PRACTICE PAPER SET 1

Please write clearly, in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

H

Higher Tier Paper 1 Non-Calculator

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- mathematical instruments

You must **not** use a calculator.

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- 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.
- 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	
24 - 25	
TOTAL	

Do not write outside the box

1 (a) Write down a number with value greater than 2.33 and less than $2.\dot{3}$

[1 mark]

Answer _____

1 (b) Write down a fraction with value between $\frac{1}{5}$ and $\frac{1}{4}$

[1 mark]

_____

_____

Answer _____

2 Here is a sequence.

15 19 23 27 31

Work out an expression for the nth term of the sequence.

[1 mark]

_____

_____

_____

_____

Answer _____

Do not write outside the box

3 Work out the value of 300^2

Give your answer in standard form.

[2 marks]

Answer _____

4 Work out $64.5 \div 0.15$

[2 marks]

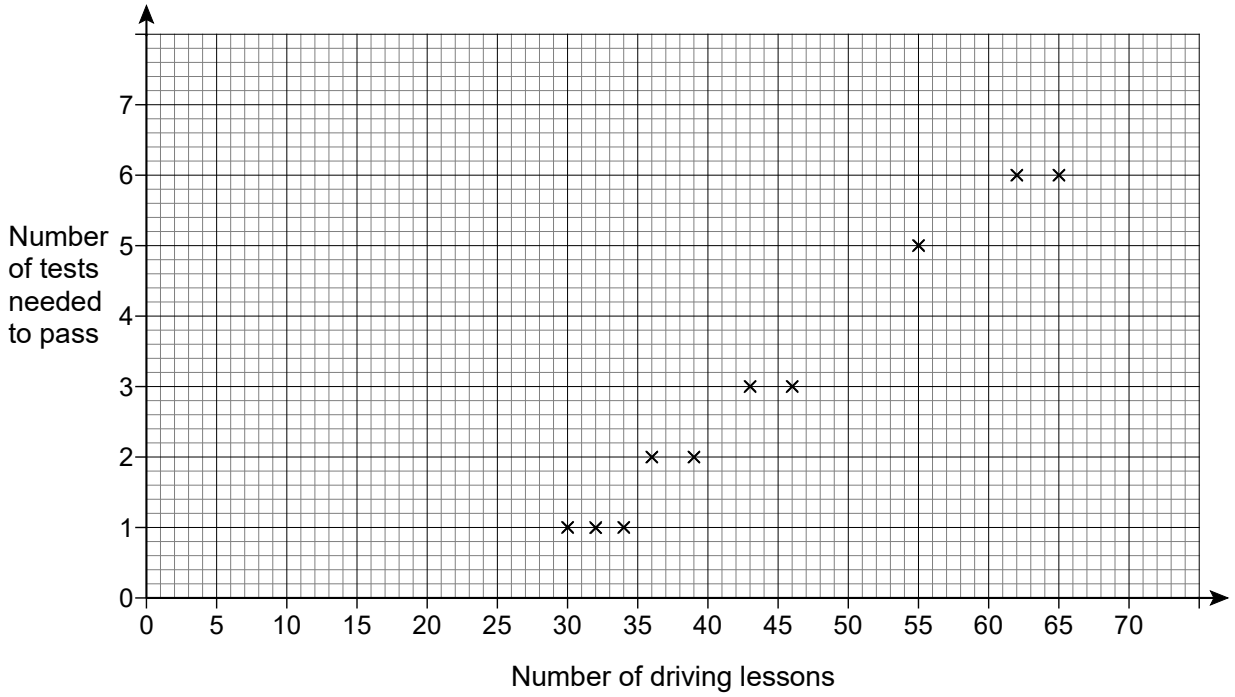
Answer _____

Turn over for the next question

7

Do not write outside the box

5 The scatter graph shows the number of driving lessons and the number of tests needed to pass by 10 people.



5 (a) Describe the correlation.

Circle your answer.

[1 mark]

strong positive weak positive weak negative strong negative

5 (b) Use a line of best fit to estimate the number of tests needed to pass by a person who has 50 lessons.

[2 marks]

Answer _____

Do not write outside the box

5 (c) Meera says,

> "I can use the trend to predict the number of driving tests needed to pass for any number of driving lessons."

Comment on their statement.

[1 mark]

6 Which of $\frac{7}{8}$ or $1\frac{1}{5}$ is closer in value to 1?

You **must** show your working.

[3 marks]

Answer _____

Turn over for the next question

7

Do not write outside the box

7 $3a + 2b = 25.5$

$a + 2b = 16.5$

Work out the values of a and b.

[3 marks]

$a =$ _____

$b =$ _____

8 Write down the value of cos 30°

[1 mark]

Answer _____

Do not write outside the box

9 Five integers have:

a mode of 1

a median of 2

a mean of 3

What is the greatest possible range of the five integers?

You **must** show your working.

[3 marks]

Answer _____

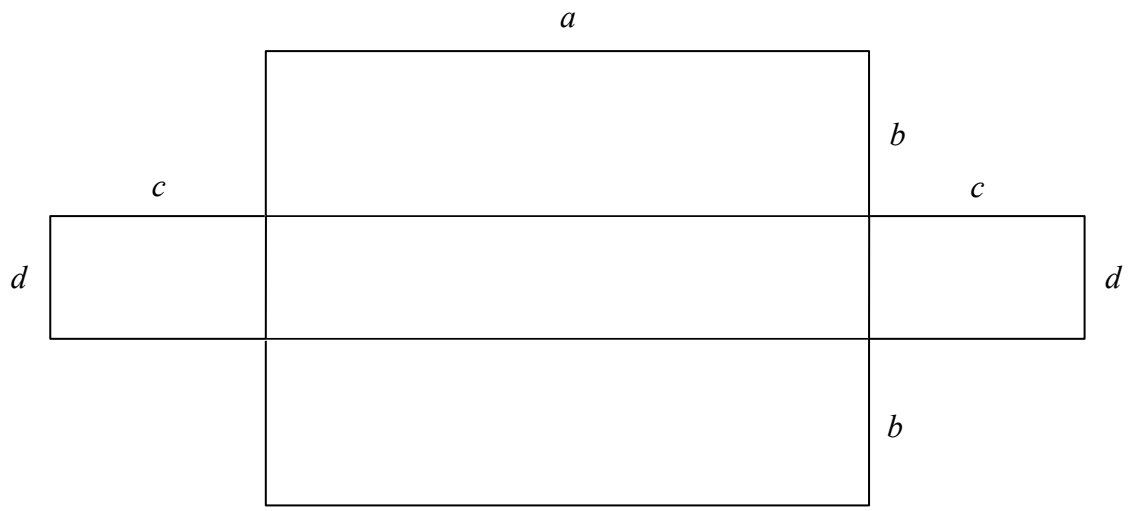
Turn over for the next question

7

10 A shape is made from rectangles.

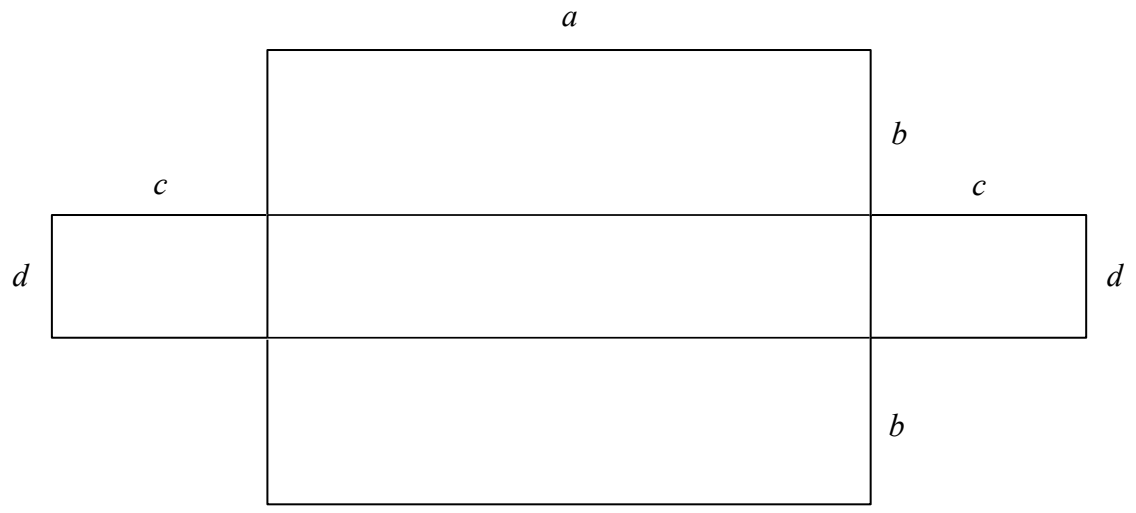
10 (a) On the diagram below shade an area represented by the expression cd.

[1 mark]



10 (b) On the diagram below shade an area represented by the expression $2ab$.

[1 mark]



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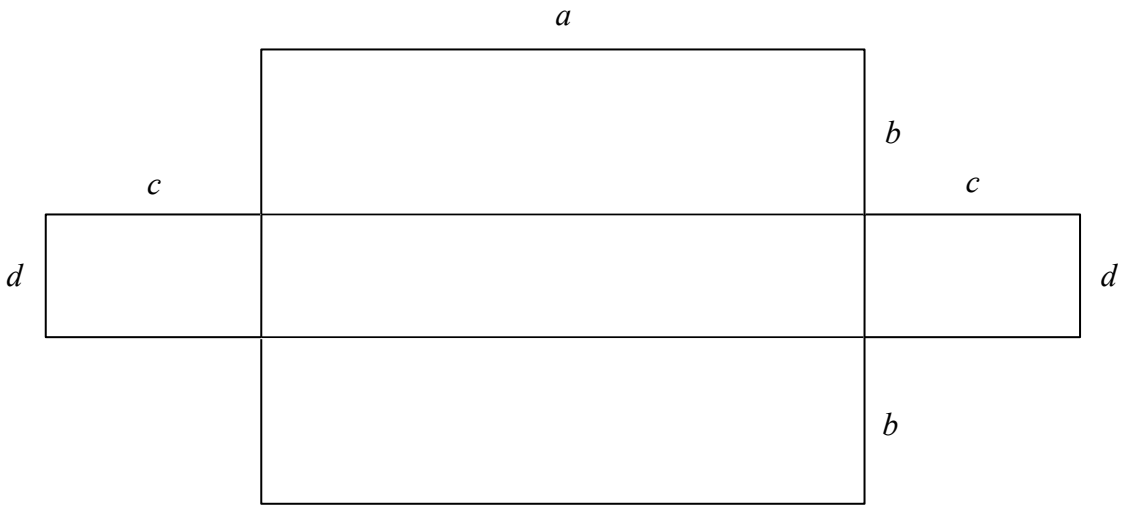
10 (c) Write down an expression for the area of the whole shape.

[1 mark]



Answer _____

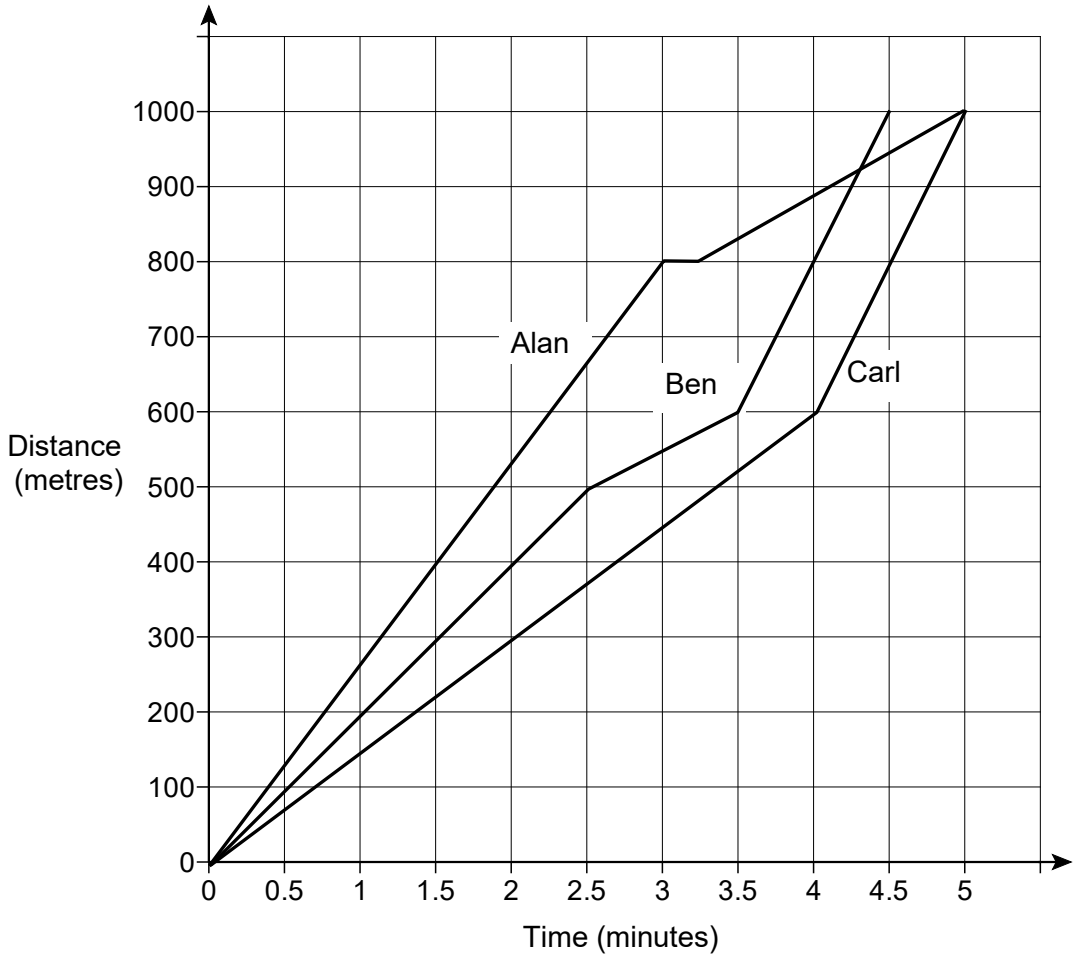
Turn over for the next question

3

Do not write outside the box

11 Alan, Ben and Carl ran a 1000 metre race.

The distance-time graph shows the race.



11 (a) Who won the race?

Give a reason for your answer.

[2 marks]

Answer _____

Reason _____

_____

_____

Do not write outside the box

11 (b) Describe the race.

Mention each runner at least once.

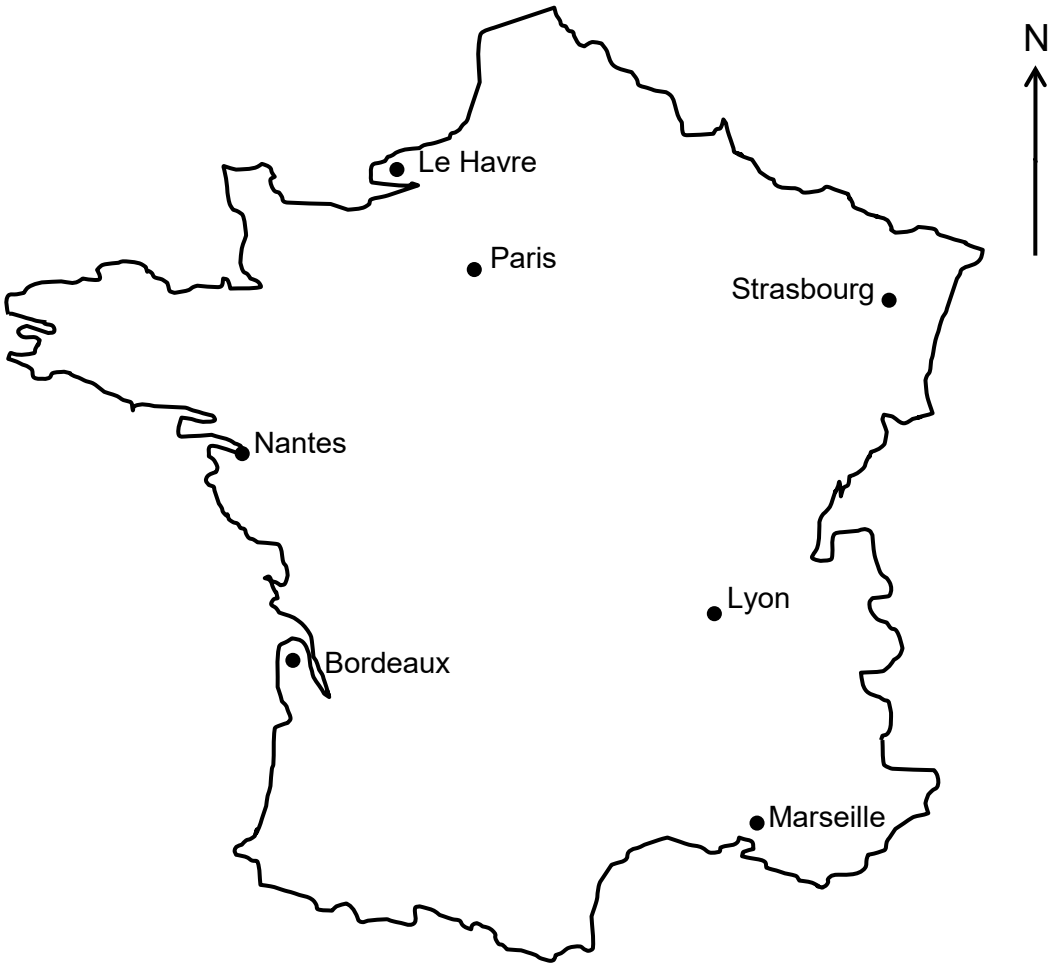
[3 marks]

Turn over for the next question

5

Do not write outside the box

12 Here is a map of France.



Scale: 1 cm represents 80 km

12 (a) Estimate the time it would take to drive from Nantes to Paris.

Assume

- the road is straight
- an average speed of 100 km/h

[4 marks]

Do not write outside the box

Answer _____ hours

12 (b) Comment on how each assumption affects the accuracy of your estimate.

[2 marks]

Assumption 1 _____

Assumption 2 _____

13 Write $4(3x + 2) + 2(x - 3) + 19$ in the form $a(bx + c)$

where a, b and c are integers and $a > 1$

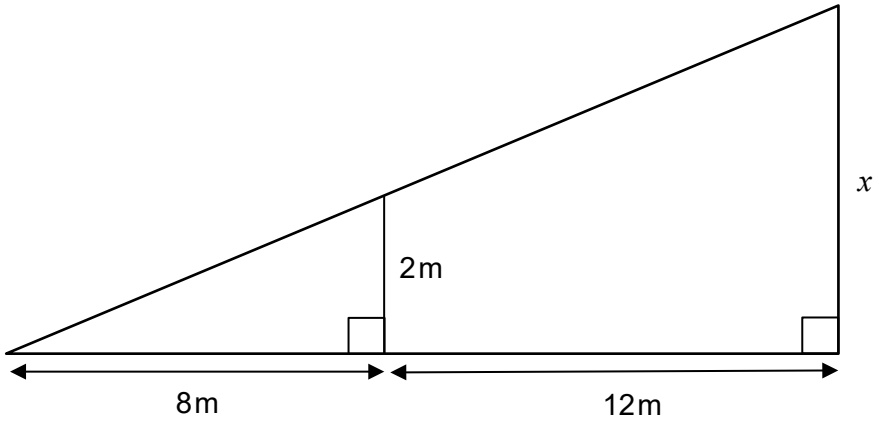
[3 marks]

Answer _____

9

Do not write outside the box

14 The diagram shows a small triangle which is also part of a large triangle.



Work out the value of x.

[2 marks]

Answer _____

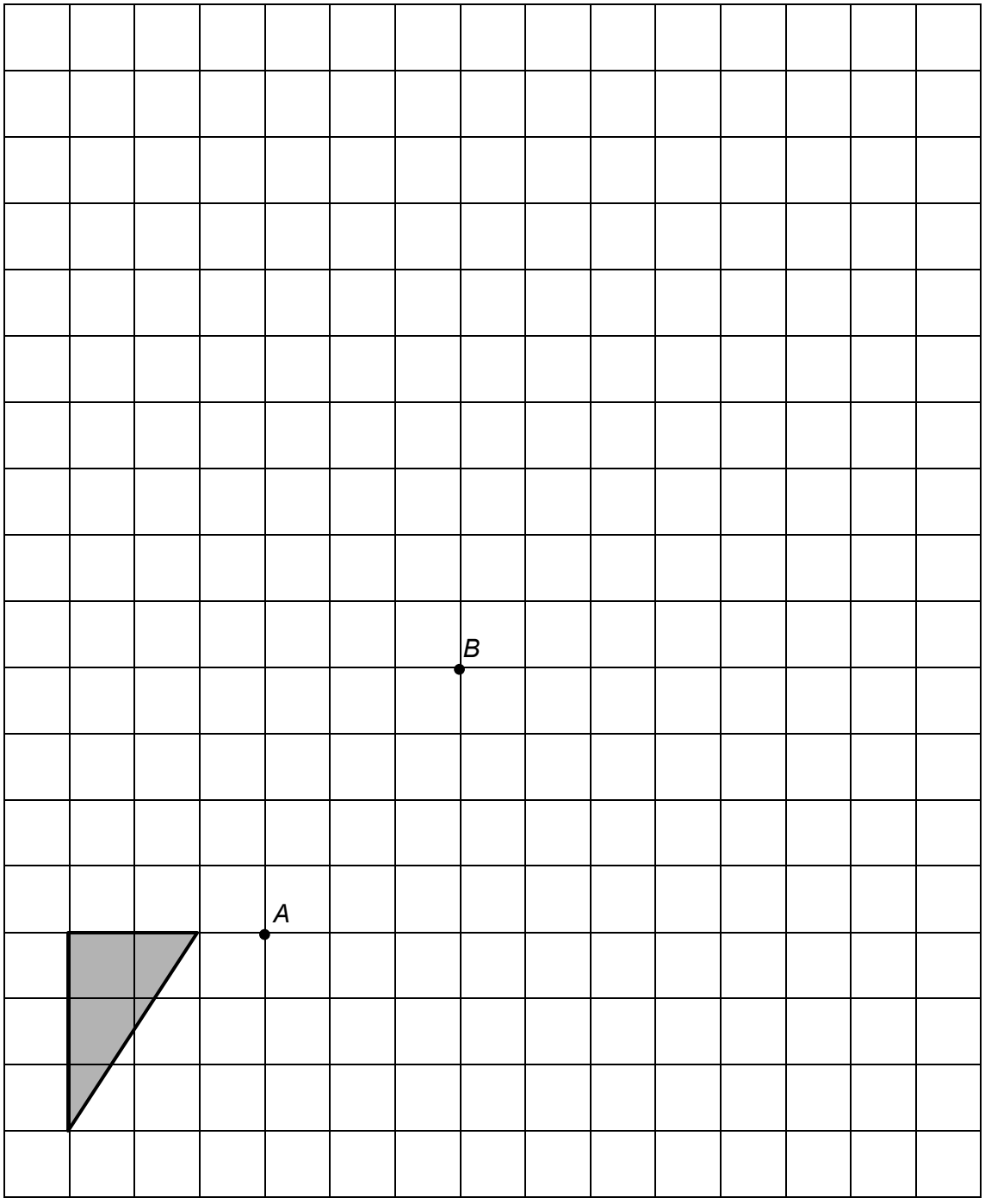
Do not write outside the box

15 The shape is **rotated** 180° about point *A*.

It is then **enlarged** by scale factor −2, centre *B*.

Draw the final shape on the diagram.

[3 marks]



5

Do not write outside the box

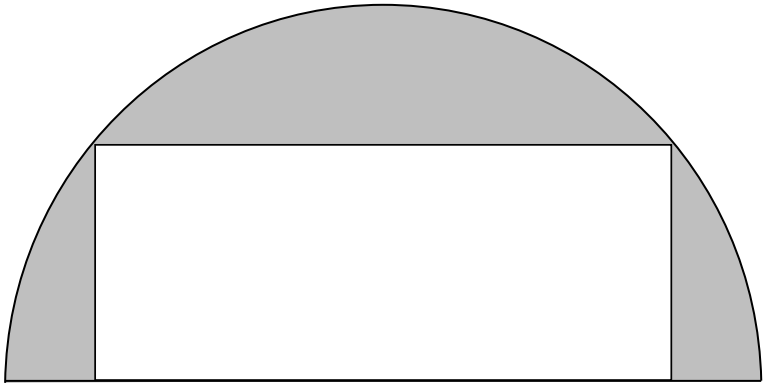
16 Rearrange $d = \dfrac{3 + 2c}{c - 7}$ to make c the subject.

[4 marks]

Answer _____

17 The diagram shows a rectangle inside a semicircle.
The rectangle has dimensions 24 cm by 5 cm.

Not drawn accurately



Work out the shaded area.
Give your answer in terms of π.

[4 marks]

Answer _____ cm^2

8

Do not write outside the box

18 Work out the value of $16^{-\frac{1}{2}}$

[2 marks]

Answer _____

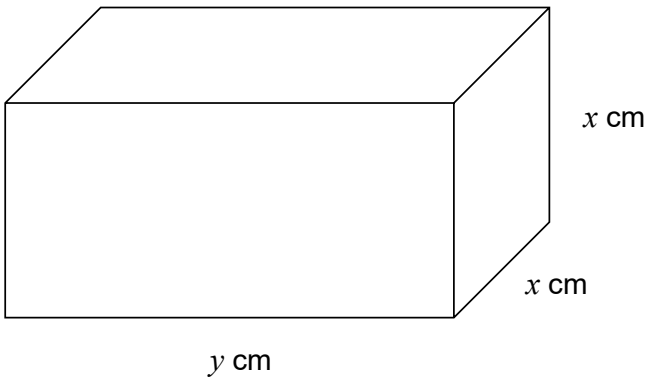
19 Expand and simplify $(x + 6)(x - 6)(3x - 5)$

[3 marks]

Answer _____

Do not write outside the box

20 A cuboid has dimensions x cm, x cm and y cm.



x is increased by 20%

y is decreased by 10%

Work out and describe the percentage change in the volume of the cuboid.

[4 marks]

Answer _____

Turn over for the next question

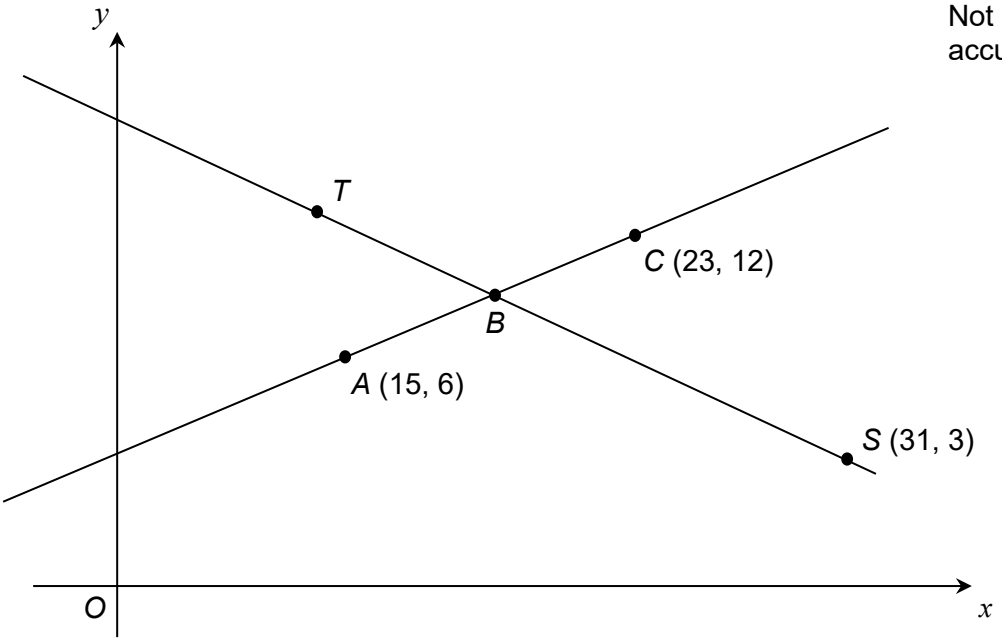
9

Do not write outside the box

21 Two straight lines are shown.

B is the midpoint of AC.

$TB : BS = 2 : 3$



Not drawn accurately

Work out the coordinates of T.

[4 marks]

Answer (_____ , _____)

Do not write outside the box

22 Write $\frac{18}{\sqrt{2}} - \frac{12}{\sqrt{32}}$ in the form $\frac{a\sqrt{2}}{b}$ where a and b are integers.

[3 marks]

Answer _____

Turn over for the next question

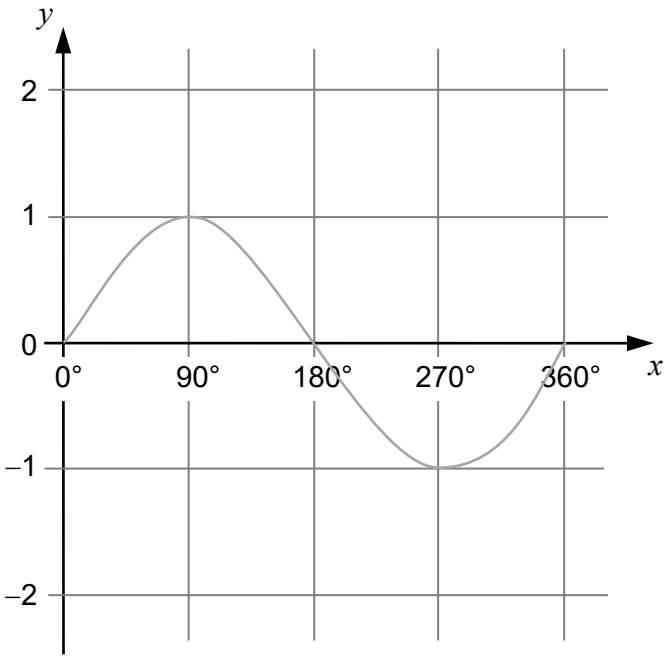
7

Do not write outside the box

23 (a) The graph of $y = \sin x$ is shown for $0° \leqslant x \leqslant 360$.

On the grid sketch the graph of $y = \sin x + 1$ for $0° \leqslant x \leqslant 360°$

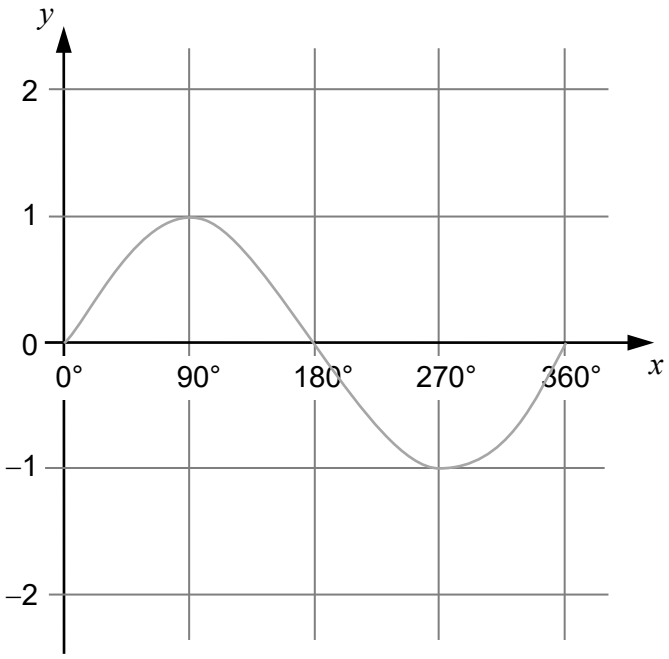
[1 mark]



23 (b) The graph of $y = \sin x$ is shown on the grid for $0° \leqslant x \leqslant 360°$

On this grid sketch the graph of $y = -\sin x$ for $0° \leqslant x \leqslant 360°$

[1 mark]



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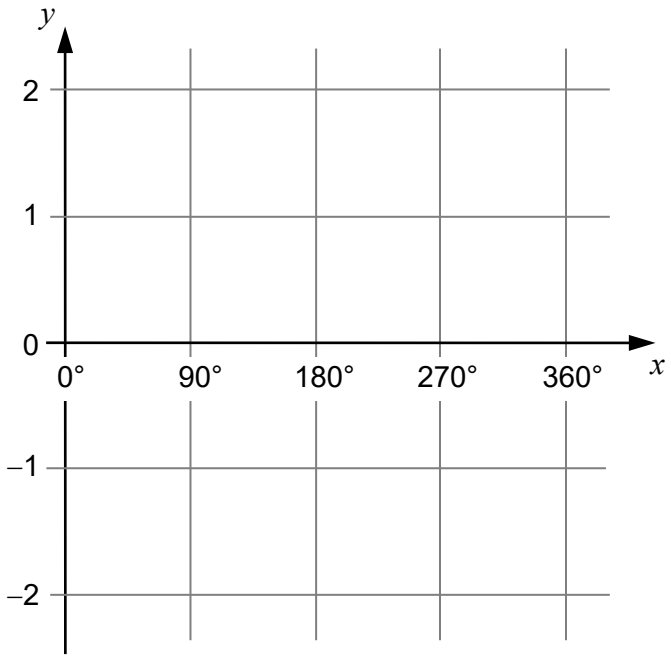
23 (c) On this grid sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$.

[1 mark]



Turn over for the next question

3

Do not write outside the box

24 A bag contains n beads.

One bead is black and the rest are white.

Two beads are taken from the bag at random.

24 (a) Show that the probability that both beads are white is $\frac{n-2}{n}$

[2 marks]

24 (b) The probability that **both** beads are white is greater than 0.8.

Work out the **least** possible value of n.

[3 marks]

Answer _____

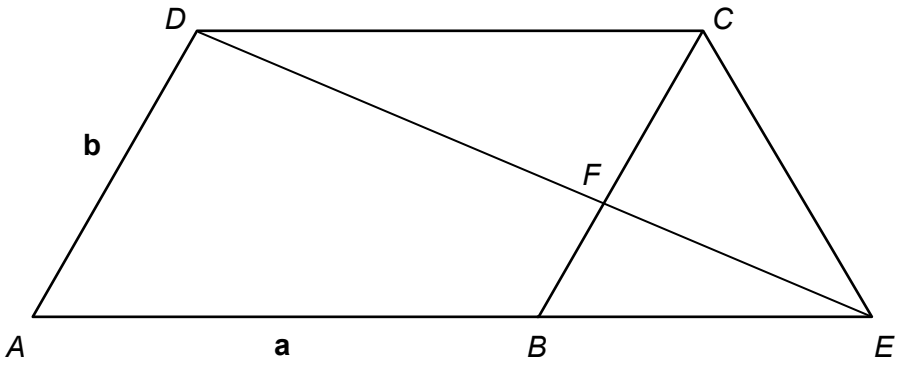
25 *ABCD* is a parallelogram.

ABE is a straight line and $AB : BE = 4 : 3$

BC and *ED* intersect at *F*.

$\overrightarrow{AB} = \mathbf{a}$ and $\overrightarrow{AD} = \mathbf{b}$

Not drawn accurately



25 (a) Work out ED in terms of **a** and **b**.

Give your answer in its simplest form.

[3 marks]

Answer _____

25 (b) Deduce $\overrightarrow{EF}$ in terms of **a** and **b**.

[2 marks]

Answer _____

END OF QUESTIONS

10

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED