OXFORD

INTERNATIONAL AQA EXAMINATIONS

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

INTERNATIONAL GCSE

MATHEMATICS EXTENSION

E

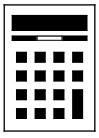
Paper 1E

Monday 20 May 2019 07:00 GMT Time allowed: 2 hours

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



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 100.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
- If your calculator does not have a π button, take the value of π to be 3.142

Advice

- Show all necessary working; otherwise marks for method may be lost.

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	
26	
TOTAL	

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

Do not write outside the box

1 Circle the number in standard form.

[1 mark]

50×10^3 0.3×10^5 5×10^{-3} $3 \times 10^{\frac{1}{5}}$

2 $a : b : c = 3 : 5 : 1$

Write the ratio $b : c$ in the form $1 : n$

Circle your answer.

[1 mark]

$1 : \frac{1}{9}$ $1 : \frac{1}{8}$ $1 : \frac{1}{6}$ $1 : \frac{1}{5}$

3 The number 10^{20} is written as an ordinary number.

How many digits are there?

Circle your answer.

[1 mark]

20 21 200 201

Do not write outside the box

4 Circle the largest number.

[1 mark]

$5.4\dot{2}$ $5.\dot{4}$ $5.2\dot{4}$ $5.\dot{2}$

5 p and q are both prime numbers less than 10

5 (a) Work out **one** pair of values of p and q so that $p + q$ is a square number.

[1 mark]

$p =$ _____ $q =$ _____

5 (b) Work out **one** pair of values of p and q so that $3p + q$ is a prime number.

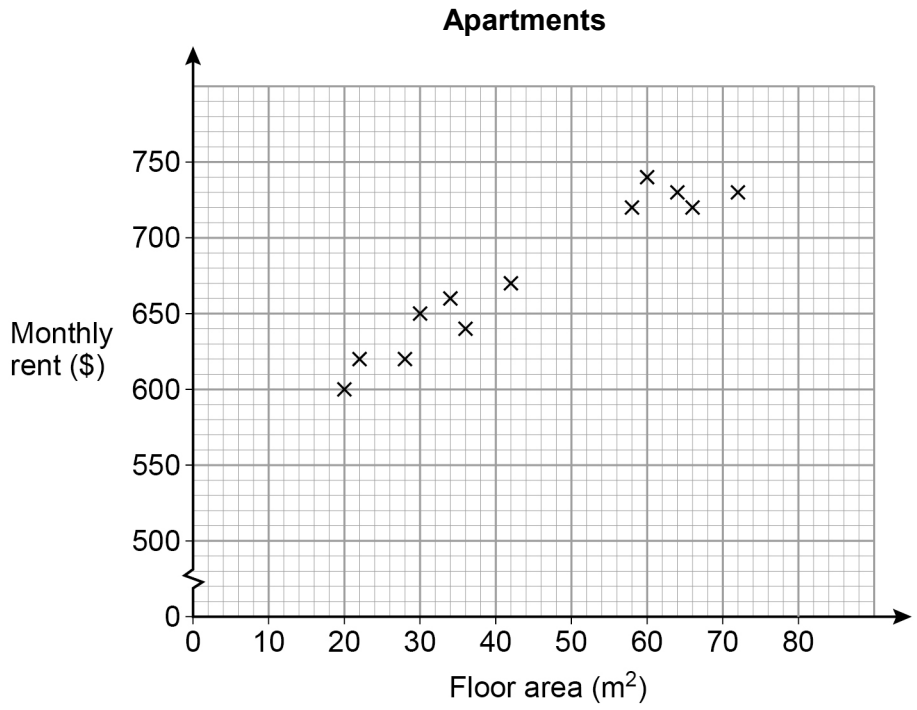
[1 mark]

$p =$ _____ $q =$ _____

6

Do not write outside the box

6 The scatter graph shows the floor areas and monthly rents of some apartments.



6 (a) Write down the type of correlation shown by the graph.

[1 mark]

Answer _____

6 (b) Zayn is going to rent an apartment with a floor area of 50 m^2

Draw a line of best fit and use it to estimate his **yearly** rent.

[3 marks]

_____

_____

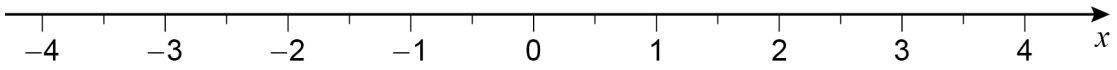
_____

Answer $ _____

Do not write outside the box

7 (a) On the number line, represent the solution set of $2x + 1 \geqslant 4$

[3 marks]



7 (b) Here are all the integer solutions to one of the four inequalities below.

$$-3, -2, -1, 0, 1, 2$$

Circle the correct inequality.

[1 mark]

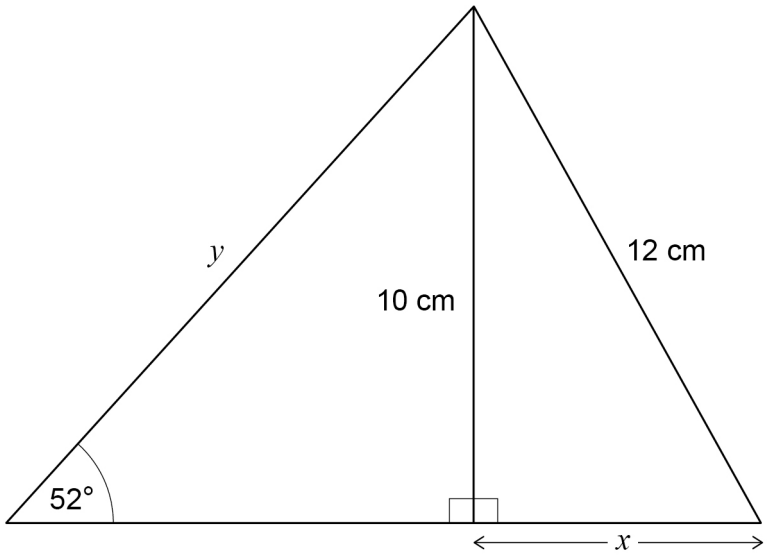
$-8 \leqslant 2y < 4$ $-8 \leqslant 2y \leqslant 4$ $-8 < 2y < 4$ $-8 < 2y \leqslant 4$

Turn over for the next question

8

Do not write outside the box

8 The diagram shows two right-angled triangles.



Not drawn accurately

8 (a) Work out the value of x.

[3 marks]

Answer _____ cm

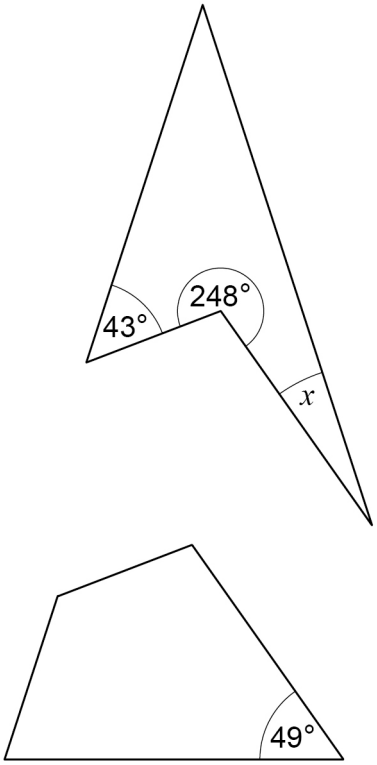
8 (b) Work out the value of y.

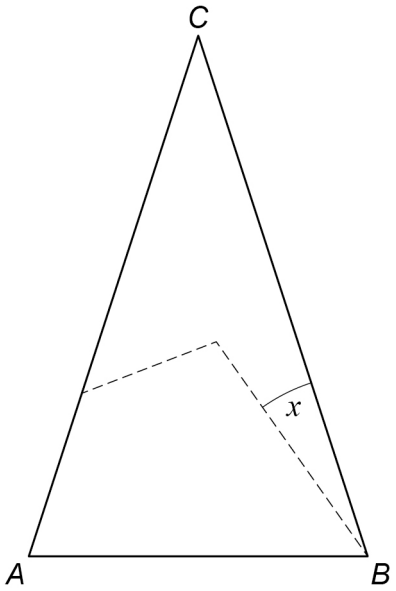
[3 marks]

Answer _____ cm

Do not write outside the box

9 Two quadrilaterals join to make isosceles triangle *ABC* as shown.





Not drawn accurately

$AC = BC$

Work out the size of angle x.

[4 marks]

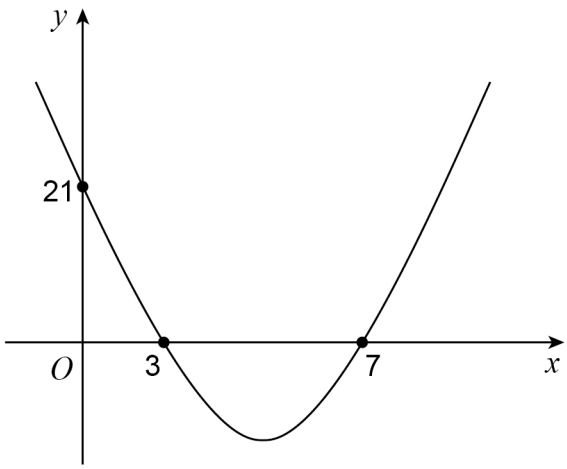
Answer _____ °

10

Turn over ►

Do not write outside the box

10 Here is a sketch of $y = x^2 - 10x + 21$



10 (a) Use the sketch to write down the roots of $x^2 - 10x + 21 = 0$

[1 mark]

Answer _____

10 (b) Work out the coordinates of the turning point.

[2 marks]

_____

_____

_____

Answer (_____ , _____)

Do not write outside the box

11 $a = 2^2 \times 3^3 \times 7$ and $b = 2^6 \times 3^2 \times 11^4$

Work out the highest common factor of a and b.

[1 mark]

Answer _____

12 C is a cube.

T is a triangular prism.

volume of C : volume of T = number of faces of C : number of faces of T

The **total** volume of C and T is 330 cm^3

Work out the volume of C.

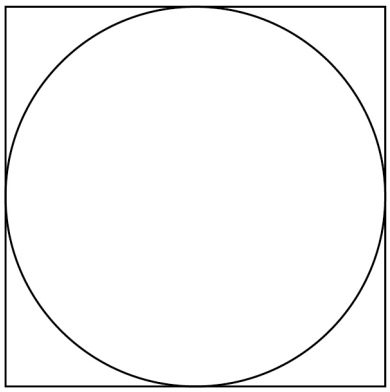
[3 marks]

Answer _____ cm^3

7

Do not write outside the box

13 A wire decoration is made of a circle inside a square as shown.



Show that the wire used for the circle is **less than** 80% of the wire used for the square.

[3 marks]

Do not write outside the box

14 The first half of a football match lasted 48 minutes, correct to the nearest minute.

14 (a) Circle the least possible time for the first half.

[1 mark]

47 minutes 47.5 minutes 47.9 minutes 47.95 minutes

14 (b) The second half of the match lasted longer than the first half.

The difference was 2 minutes, correct to the nearest minute.

Give an example to show that the second half could have lasted 51 minutes, correct to the nearest minute.

[2 marks]

length of first half _____

difference _____

length of second half _____

6

Turn over ►

Do not write outside the box

15 $\frac{p}{q} = \frac{2}{7}$ and $\frac{q}{r} = \frac{3}{4}$

Circle the value of $\frac{p}{r}$

[1 mark]

$\frac{8}{21}$ $\frac{3}{14}$ $\frac{21}{8}$ $\frac{14}{3}$

16 x, y and z are three numbers.

x is 40% **less** than y

z is 25% **more** than y

The sum of the three numbers is 39.33

Work out the value of y.

[3 marks]

Answer _____

Do not write outside the box

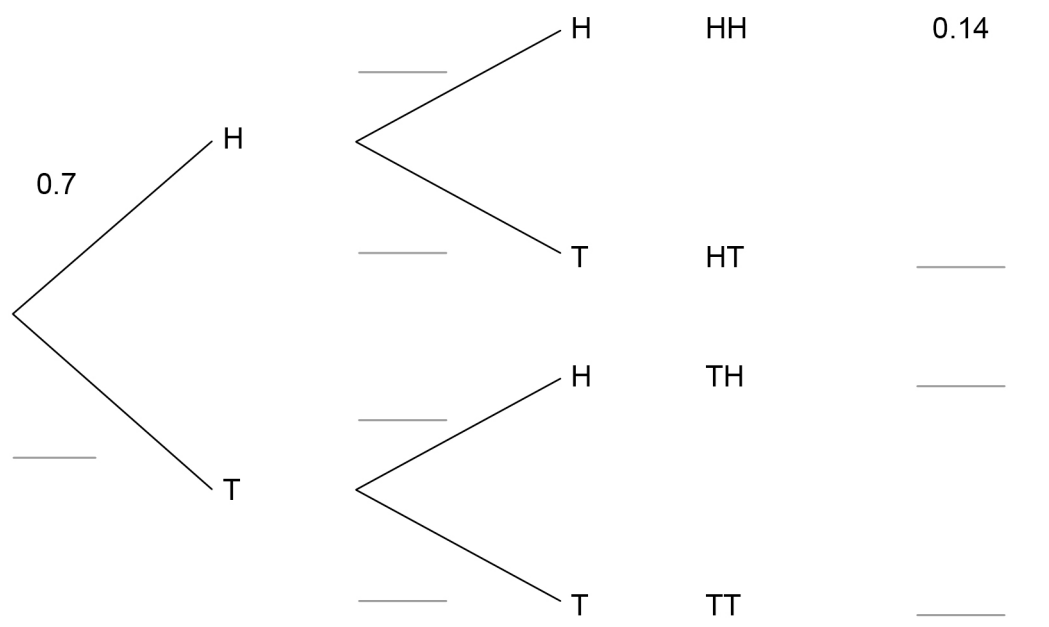
17 Two **biased** coins are thrown.

Each coin can land on heads (H) or tails (T).

The probability that both coins land on heads is 0.14

Complete the tree diagram with the eight missing probabilities.

[4 marks]



Turn over for the next question

8

Do not write outside the box

18 This data shows the number of points scored by Mateo in 11 archery tournaments.
It is ordered from lowest to highest.

10 10 a 14 14 15 16 17 18 19 24

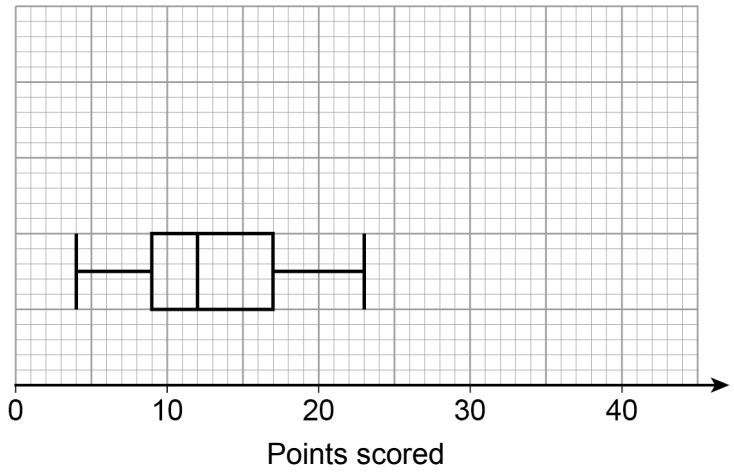
The interquartile range is 5

18 (a) Work out the value of a.

[2 marks]

Answer _____

The box plot shows the number of points scored by Aliyah in the same 11 tournaments.



18 (b) On average, who performed better?
Show working to support your answer.

[2 marks]

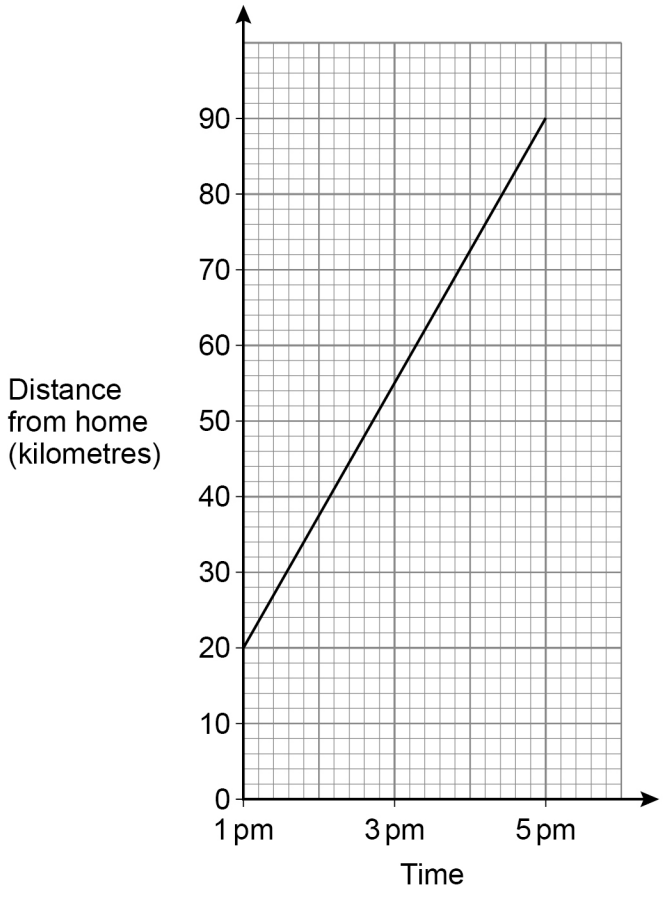
Do not write outside the box

18 (c) Who was more consistent?

Show working to support your answer.

[2 marks]

19 Here is the graph of a journey.



Work out the speed in kilometres per hour.

Circle your answer.

[1 mark]

14 17.5 18 22.5

7

Turn over ►

Do not write outside the box

20 An airline sells tickets for a flight.

The airline sells

the first 10 tickets for \$35 each

the next 20 tickets for \$55 each

all other tickets for \$80 each.

Choosing a seat costs \$18 extra.

There are n passengers on the flight.

Half of the passengers pay the extra to choose their seat.

In total, the passengers pay \$5814

Work out the value of n.

[6 marks]

Answer _____

Do not write outside the box

21 (a) Factorise $2x^2 + 5x - 3$

[2 marks]

Answer _____

21 (b) Solve $2x^2 + 5x - 3 = 0$

[1 mark]

Answer _____

Turn over for the next question

9

Do not write outside the box

22 $\begin{pmatrix} b-a & 1 \\ a & b \end{pmatrix}\begin{pmatrix} 2 \\ -5 \end{pmatrix} = \begin{pmatrix} 1 \\ 9 \end{pmatrix}$

Work out the values of a and b.

[5 marks]

$a =$ _____ $b =$ _____

Do not write outside the box

23 (a) Show that $\sqrt{125} - \sqrt{2000}$ can be written in the form $a\sqrt{5}$ where a is an integer.

[2 marks]

23 (b) By rationalising the denominator, show that $\dfrac{13+\sqrt{7}}{5-\sqrt{7}}$

simplifies to the form $b+\sqrt{7}$ where b is an integer.

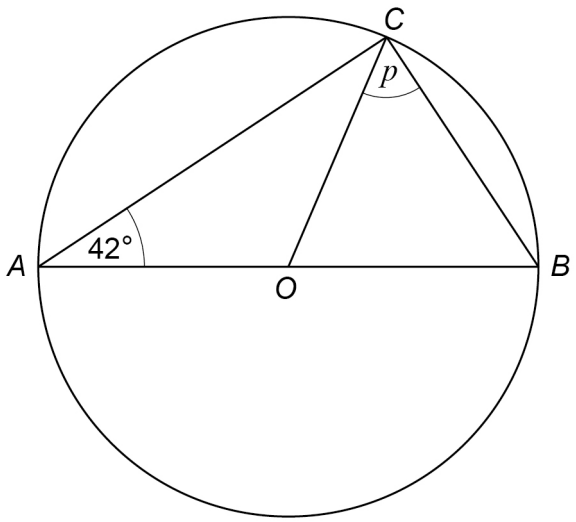
[3 marks]

10

Do not write outside the box

24 (a) A circle, centre *O*, has diameter *AB*.

C is on the circumference of the circle.



Not drawn accurately

Work out the size of angle p.

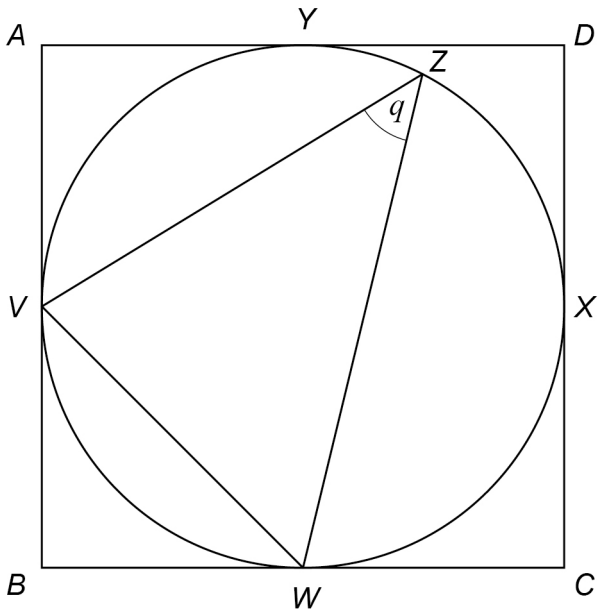
[2 marks]

Answer _____ °

Do not write outside the box

24 (b) A circle touches a square at *V*, *W*, *X* and *Y*.

A triangle has vertices on the circle at *V*, *W* and *Z*.



Not drawn accurately

Prove that $q = 45°$

[3 marks]

5

Turn over ►

Do not write outside the box

25 $f(x) = x + 4$

$g(x) = \dfrac{3x - 7}{2x} \quad x \neq 0$

25 (a) Work out the value of x when $gf(x) = 1$

[3 marks]

Answer _____

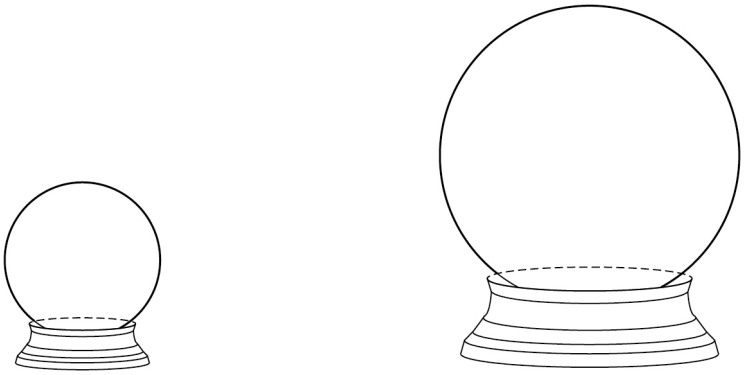
25 (b) Work out an expression for $g^{-1}(x)$

[4 marks]

Answer _____

Do not write outside the box

26 A and B are similar ornaments.



A **B**

surface area of A : surface area of B = 1 : 10.24

The volume of A is 250 cm^3

Work out the volume of B.

[3 marks]

Answer _____ cm^3

Turn over for the next question

10

Do not write outside the box

27 (a) The first four terms of a quadratic sequence are

81 104 129 156

Work out the nth term of the sequence.

[3 marks]

Answer _____

Do not write outside the box

27 (b) The nth term of a different quadratic sequence is $n^2 - 55n + 750$

By solving an inequality, work out how many negative terms there are in this sequence.
Do **not** use trial and improvement.

[3 marks]

Answer _____

28 Work out the gradient of the curve $y = (x + 5)(x - 1)$ at the point where $x = -3$

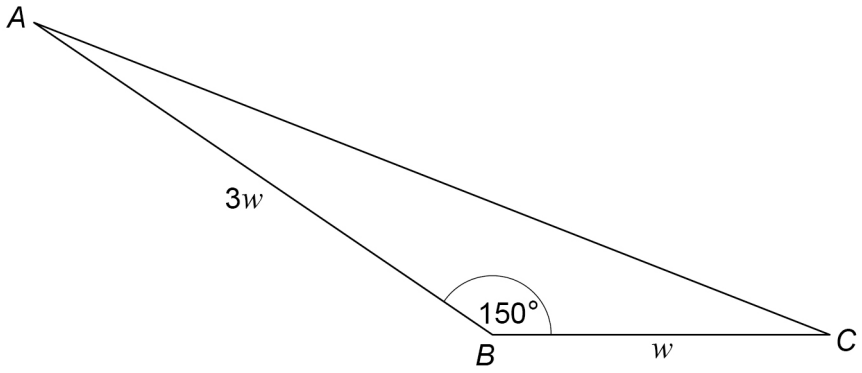
[3 marks]

Answer _____

9

Do not write outside the box

29 The area of triangle *ABC* is 4.32 cm^2



Not drawn accurately

Work out the length of *AC.*

[5 marks]

Answer _____ cm

END OF QUESTIONS

5

Do not write outside the box

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

Do not write outside the box

Question number	**Additional page, if required.** **Write the question numbers in the left-hand margin.**

Do not write outside the box

Question number	**Additional page, if required.** **Write the question numbers in the left-hand margin.**

Do not write outside the box

Question number	**Additional page, if required.** **Write the question numbers in the left-hand margin.**

Do not write outside the box

Question number	**Additional page, if required.** **Write the question numbers in the left-hand margin.**

Do not write outside the box

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED