Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

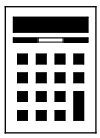
H

Higher Tier Paper 3 Calculator

Wednesday 11 June 2025 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.

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	

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

Do not write outside the box

1 Convert 8.25 pounds into kilograms.

Use 2.2 pounds = 1 kilogram

[2 marks]

Answer _____ kg

2 Here are the temperatures in six cities in degrees Celsius.

0°C –3°C 0°C 1.5°C 23°C 4°C

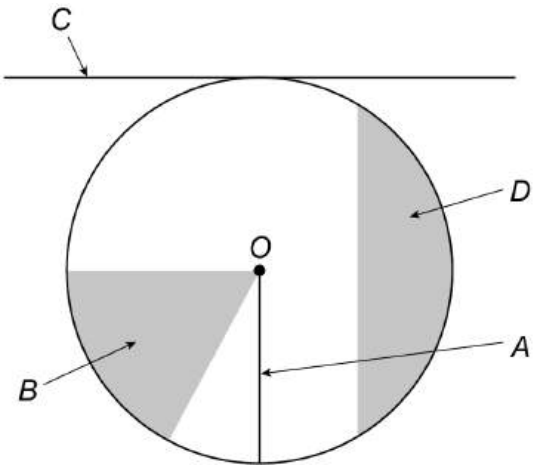
Write down the outlier.

[1 mark]

Answer _____ °C

Do not write outside the box

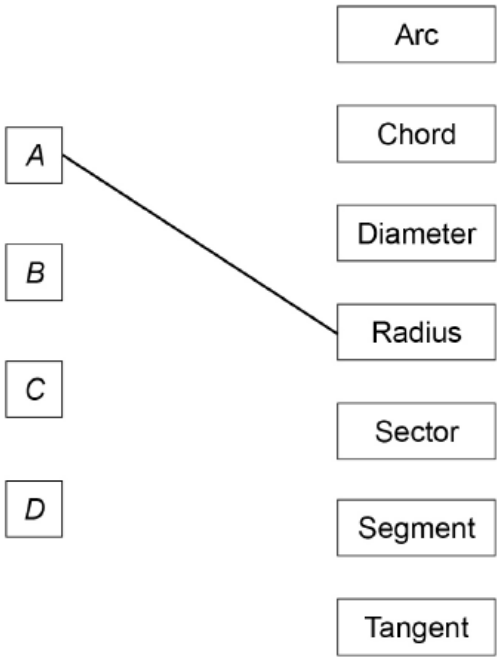
3 Here is a circle, centre *O*



Match each letter to the correct word.

One has been done for you.

[3 marks]



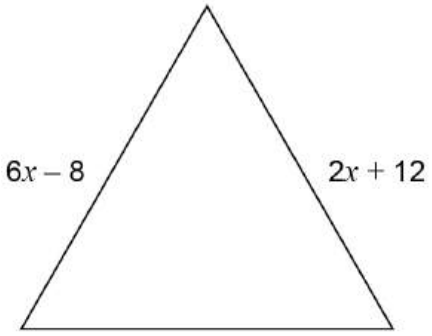
6

Do not write outside the box

4 Here is an equilateral triangle.

All measurements are in centimetres.

Not drawn accurately



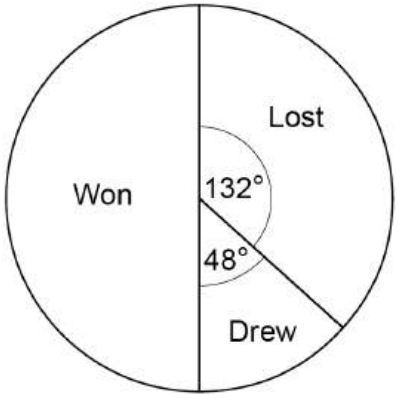
Work out the value of the perimeter of the triangle.

[4 marks]

Answer _____ cm

Do not write outside the box

5 The pie chart represents the results of matches played by a team.



30 matches were **won**.

How many matches were lost?

[3 marks]

Answer _____

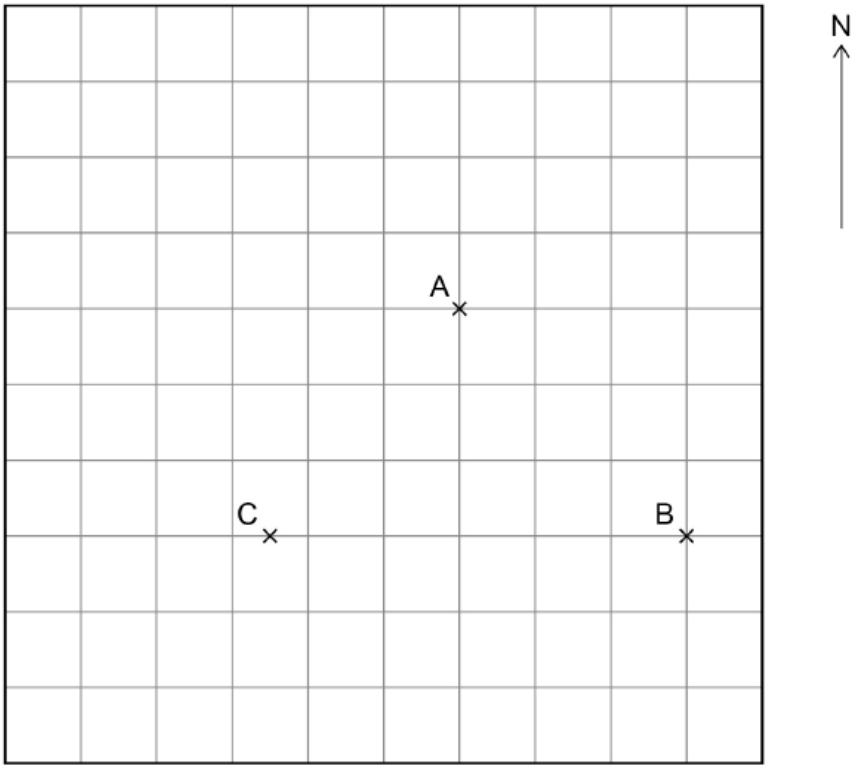
Turn over for the next question

7

Do not write outside the box

6 Here is a scale diagram showing towns A, B and C on a centimetre grid.

Scale 1 : 200 000



6 (a) Work out the **actual** distance from B to C.

Give your answer in kilometres.

[4 marks]

Answer _____ km

Do not write outside the box

6 (b) B is South East of A.

Write down the bearing of B from A.

[1 mark]

Answer _____ °

7 (a) Write 2 weeks as a fraction of 8 days.

Give your answer in its simplest form.

[1 mark]

Answer _____

7 (b) Write 56 centimetres : 2.73 metres as a ratio in the form 1 : n

[1 mark]

Answer 1 : _____

7 (c) A : B = $\frac{1}{5} : \frac{7}{10}$

Write A as a fraction of B.

[2 marks]

Answer _____

9

Do not write outside the box

8 A linear sequence has

- 2nd term = 6
- 5th term = 18

Work out the nth term of the sequence.

[3 marks]

Answer _____

9 Ary, Bea and Cat each have an amount of money.

Cat has £280

- Cat's amount is $\frac{2}{3}$ of Bea's amount.
- Ary's amount : Bea's amount = 5 : 12

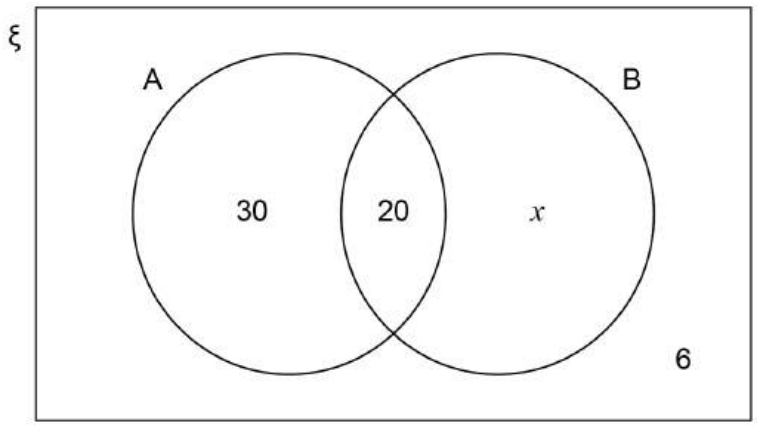
Work out how much money Ary has.

[3 marks]

Answer £ _____

Do not write outside the box

10 The Venn diagram shows some of the **numbers** of items in each set.



$P(A) = \frac{1}{2}$

Work out the value of x.

[2 marks]

$x =$ _____

Turn over for the next question

8

Do not write outside the box

11 (a) Write down the equation of a straight line parallel to $y - 2x = 9$

[1 mark]

Answer _____

11 (b) A straight line

- has gradient 5
- passes through the point (3, 7)

Circle the equation of the line.

[1 mark]

$y = 3x - 2$ $y = 3x + 7$ $y = 5x$ $y = 5x - 8$

Do not write outside the box

12 Rob records the time he takes to drive to work every day for 80 days.

The table shows information about the results.

Time, t (minutes)	Frequency
$20 \leqslant t < 25$	16
$25 \leqslant t < 30$	32
$30 \leqslant t < 40$	24
$40 \leqslant t < 60$	8
	Total = 80

Last year, the **mean** time Rob took to drive to work was 25 minutes.

Estimate the percentage increase in the **mean** driving time for these 80 days.

[4 marks]

Answer _____ %

6

Turn over ►

Do not write outside the box

13 The table shows information about the salary of 90 employees.

Salary, s (£)	Frequency
$0 < s \leqslant 20\,000$	44
$20\,000 < s \leqslant 40\,000$	22
$40\,000 < s \leqslant 60\,000$	14
$60\,000 < s \leqslant 80\,000$	5
$80\,000 < s \leqslant 100\,000$	2
$100\,000 < s \leqslant 120\,000$	3

13 (a) Complete the cumulative frequency table.

[1 mark]

Salary, s (£)	Cumulative Frequency
$s \leqslant 20\,000$	44
$s \leqslant 40\,000$	66
$s \leqslant 60\,000$	
$s \leqslant 80\,000$	
$s \leqslant 100\,000$	
$s \leqslant 120\,000$	

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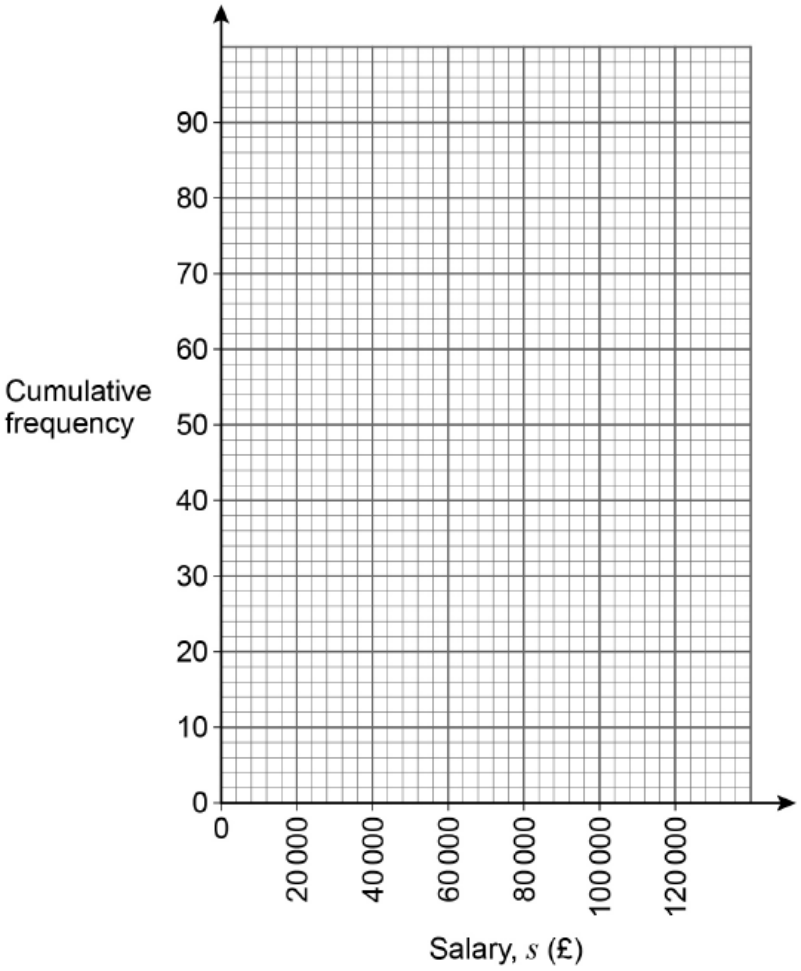
13 (b) Draw a cumulative frequency diagram to represent the data.

[2 marks]



13 (c) Estimate the number of employees with a salary **less** than £32 000

[2 marks]

Answer _____

5

Turn over ►

Do not write outside the box

14 (a) For a small plane,

- the mass of the empty plane is 800 kg, to the nearest 100 kg
- the mass of fuel is 190 kg, to the nearest 5 kg
- the mass of the passengers is 163 kg, to the nearest kg

The total mass of a plane is calculated by adding these three masses.

The **maximum** mass for the plane to take off safely is 1200 kg

Can this plane definitely take off safely?

Tick a box.

Yes ☐ No ☐

Show working to support your answer.

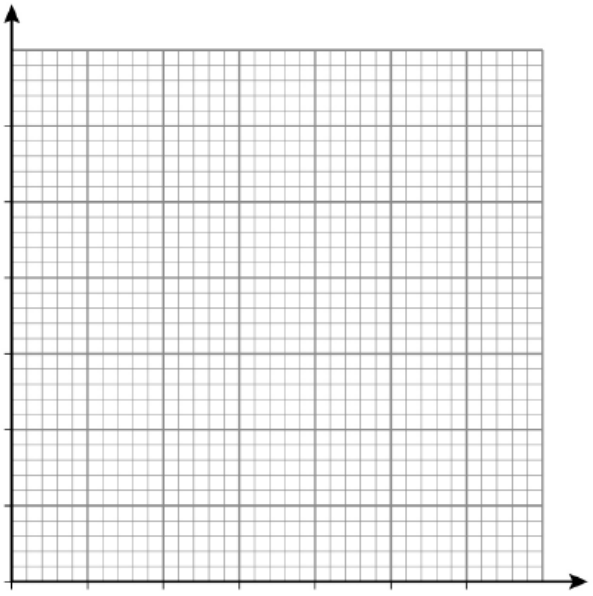
[4 marks]

Do not write outside the box

14 (b) A different plane travels 1250 miles in 2 hours 30 minutes at a constant speed.

On the grid, draw a **speed/time** graph to represent this information.

[3 marks]



Turn over for the next question

7

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15 Amy and Becky each make integers using **three** single digits.

In any integer, digits may be repeated.

- Amy makes **even** integers with a first digit greater than 7
- Becky makes **odd** integers with a first digit that is non-zero.

They each make as many different integers as possible.

How many **more** integers than Amy does Becky make?

[3 marks]

Answer _____

Do not write outside the box

16 x is a **positive even number**.

$y = (x - 3)(x - 5)(x + 6)$

Without expanding brackets,

explain why there is only one value of x for which y is **negative**.

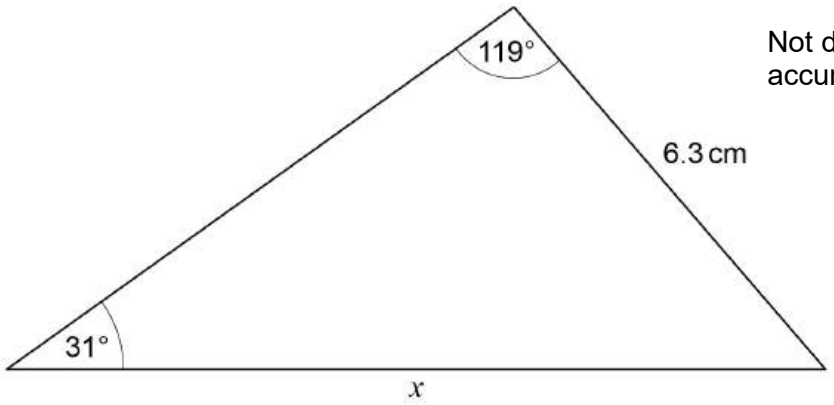
[3 marks]

Turn over for the next question

6

Do not write outside the box

17



Not drawn accurately

Use the sine rule to work out x.

[2 marks]

$x =$ _____ cm

Do not write outside the box

18 Here are the first four terms of a quadratic sequence.

6 15 28 45

Work out an expression for the nth term.

[3 marks]

Answer _____

Turn over for the next question

5

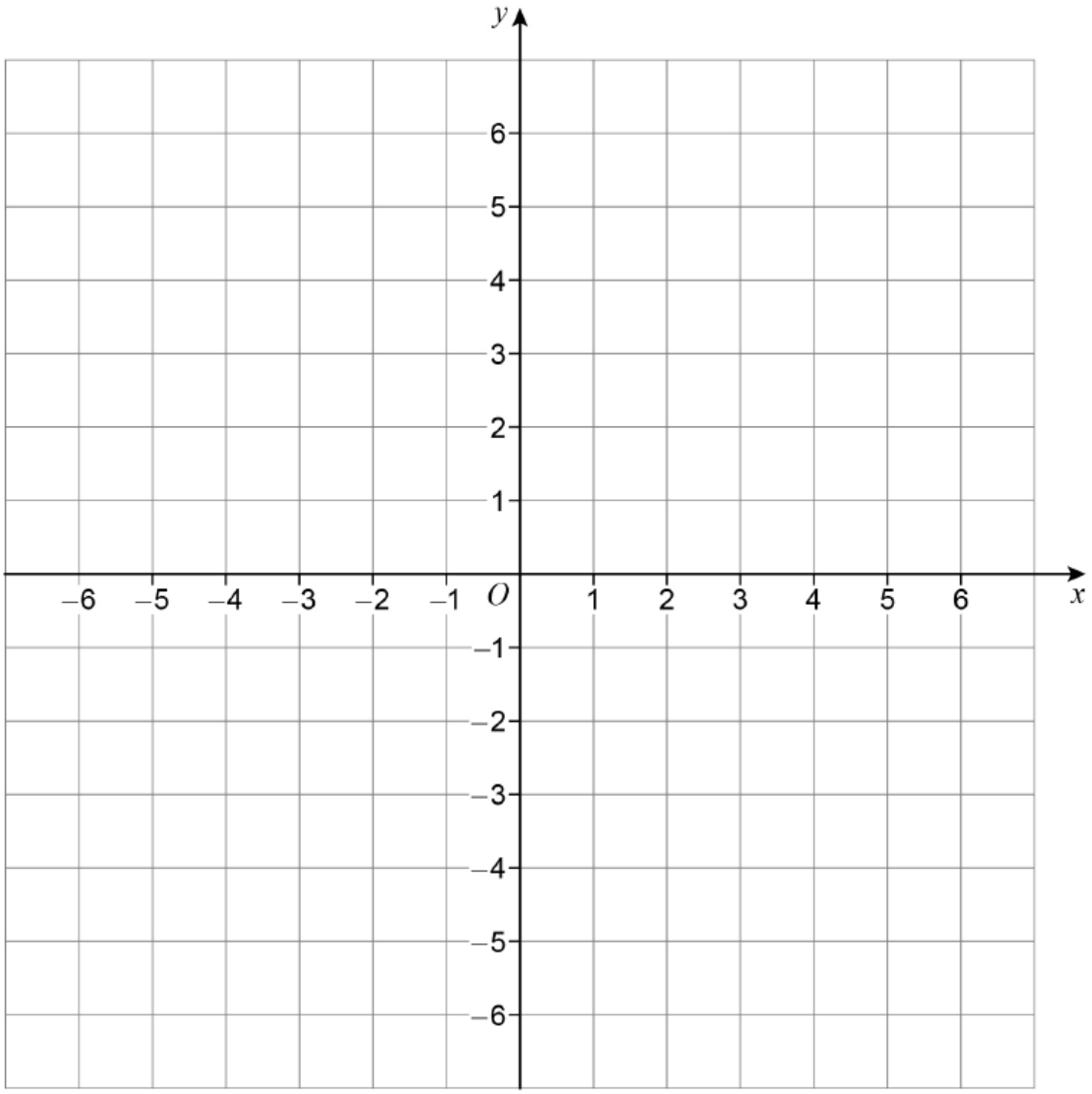
Do not write outside the box

19 On the grid, identify the region represented by

$$x + y < 5 \quad \text{and} \quad y < 2x + 4 \quad \text{and} \quad y \geqslant 1$$

Label the region R.

[4 marks]



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20 (a) Factorise fully $3n^2 + 5n + 2$

[2 marks]

Answer _____

20 (b) A sequence has nth term $3n^2 + 5n + 2$

Are any of the terms in the sequence a prime number?

Tick a box.

Yes ☐ No ☐

Give a reason for your answer.

[1 mark]

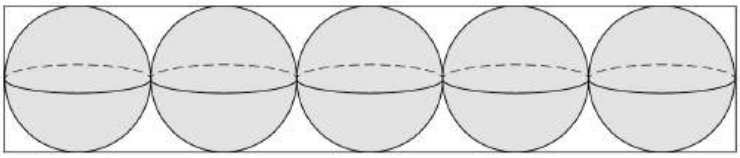
Turn over for the next question

7

Do not write outside the box

21 Five identical spheres just fit inside a **cylinder**.

Each sphere has radius r.



Volume of a sphere $= \frac{4}{3}\pi r^3$

What fraction of the space inside the **cylinder** is filled by the spheres?

You **must** show your working.

[4 marks]

Answer _____

Do not write outside the box

22 Solve $2x^2 > 12 - 5x$

[4 marks]

Answer _____

Turn over for the next question

8

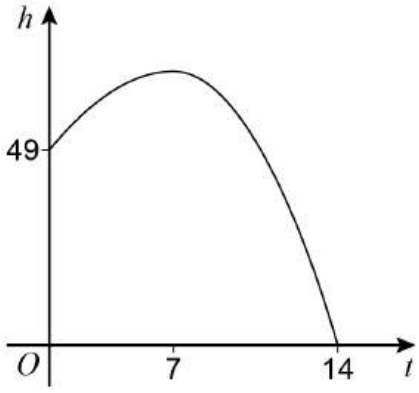
23 A roller coaster starts at ground level.

The height above ground level, h, in metres, of the roller coaster is given by

$$h = -(t - 7)^2 + 49$$

where t is the time in seconds after the roller coaster starts.

Sam draws a graph of h against t for $0 \leqslant t \leqslant 14$



Make **two** criticisms of Sam's graph.

[2 marks]

Criticism 1 _____

_____

_____

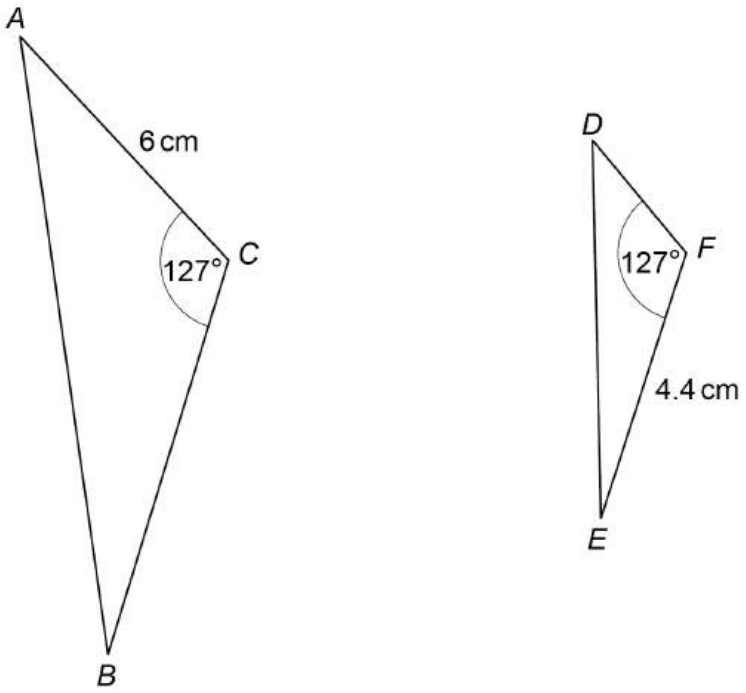
Criticism 2 _____

_____

_____

Do not write outside the box

24 Triangles *ABC* and *DEF* are similar.



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The area of *ABC* is 26.355 cm^2

Work out the area of *DEF*.

[4 marks]

Answer _____ cm^2

END OF QUESTIONS

6

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There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

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

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