Surname		Centre Number	Candidate Number
First name(s)			0

wjec cbac

GCSE

3300U40-1

Z22-3300U40-1

TUESDAY, 14 JUNE 2022 – MORNING

MATHEMATICS
UNIT 2: CALCULATOR-ALLOWED
INTERMEDIATE TIER

1 hour 35 minutes

ADDITIONAL MATERIALS

A calculator will be required for this examination.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

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

If you run out of space, use the additional page at the back of the booklet. Question numbers must be given for all work written on the additional page.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

In question **4**(d), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	4	
2.	4	
3.	6	
4.	10	
5.	5	
6.	4	
7.	5	
8.	1	
9.	3	
10.	5	
11.	6	
12.	5	
13.	6	
14.	6	
Total	70	

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Formula List – Intermediate Tier

Area of trapezium $= \frac{1}{2}(a + b)h$
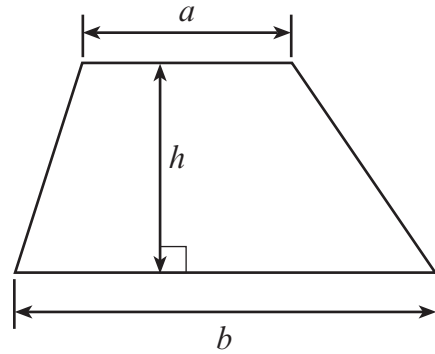
Volume of prism = area of cross-section × length

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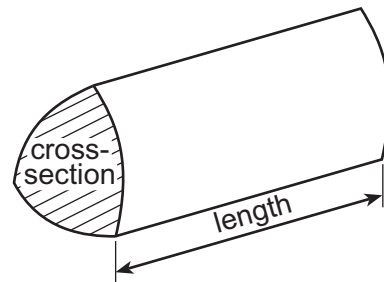
1. Calculate the following.

(a)   3·5% of 159·8 [2]

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(b) $\sqrt{262 \cdot 44} - \dfrac{3}{7} \times 24 \cdot 5$ [2]

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4

2.
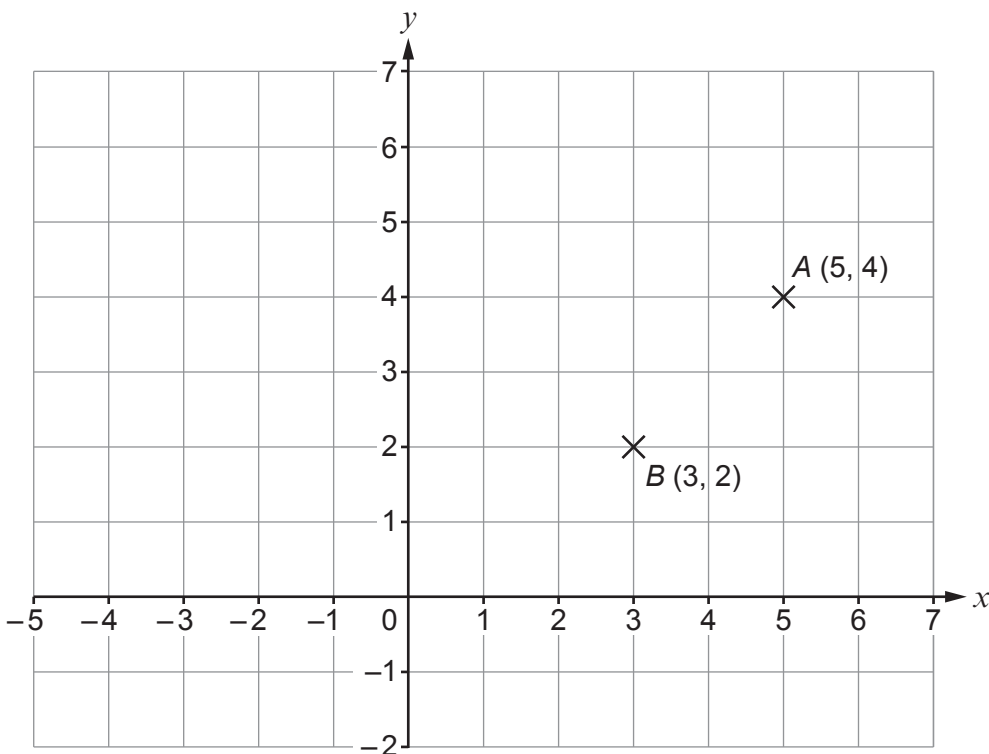
(a) B is the midpoint of the line AC.
Find the coordinates of C. [2]

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C (.................................. , ...)

(b) A and B are two vertices of a right-angled triangle.
Point D is to be plotted on the grid above so that the triangle ABD is a right-angled triangle.
The x-coordinate of D is negative.
Give the coordinates of a possible position of the point D that can be plotted on the grid above. [2]

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D (.................................. , ...)

04

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3. By first expressing all the amounts below in litres, calculate the mean of the three amounts. [6]

1·25 litres   2·73 pints   1615 ml

1·25 litres	2·73 pints ≈ .... litres	1615 ml = ... litres

Mean of the three amounts = ... litres

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4.
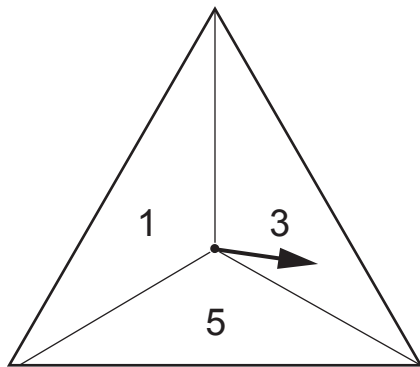
Triangular spinner
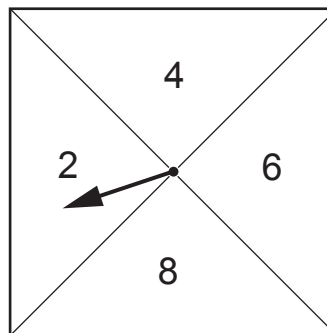
Square spinner

Two fair spinners are shown in the diagram above.
In a game, the two spinners are spun.

The two numbers obtained are multiplied together to get a score.
For example, in the diagram above, the score is 6 because $3 \times 2 = 6$.

Some of the scores are shown in the table below.

		Square spinner			
		2	**4**	**6**	**8**
	1		4		8
Triangular spinner	**3**	6		18	24
	5		20		

(a) Complete the table to show all the possible scores. [1]

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(b) Explain why all the scores are even numbers. [1]

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(c) What is the probability that a person gets a score of 10 or more when playing the game once? [2]

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(d) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Players are charged £2.50 to play the game once.
Each player who gets a score of 10 or more wins £3.50.
How much profit would you expect to make when 228 people each play the game once?
You must show all your working. [4 + 2 OCW]

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Turn over.

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07

5. The length of a rectangle is double its width.
The area of the rectangle is greater than $60\,cm^2$.
The perimeter of the rectangle is less than $40\,cm$.

Give a possible width and length of the rectangle.
Calculate the area and the perimeter of this rectangle.
You must show all your working.

Use the answer spaces to clearly identify which is the area and which is the perimeter.　　[5]

Width = ... cm　　Length = ... cm

Area = ... cm^2　　Perimeter = ... cm

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ON THIS PAGE**

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Turn over.

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09

6. (a) Reflect the shape below in the line $x = 1$. [2]

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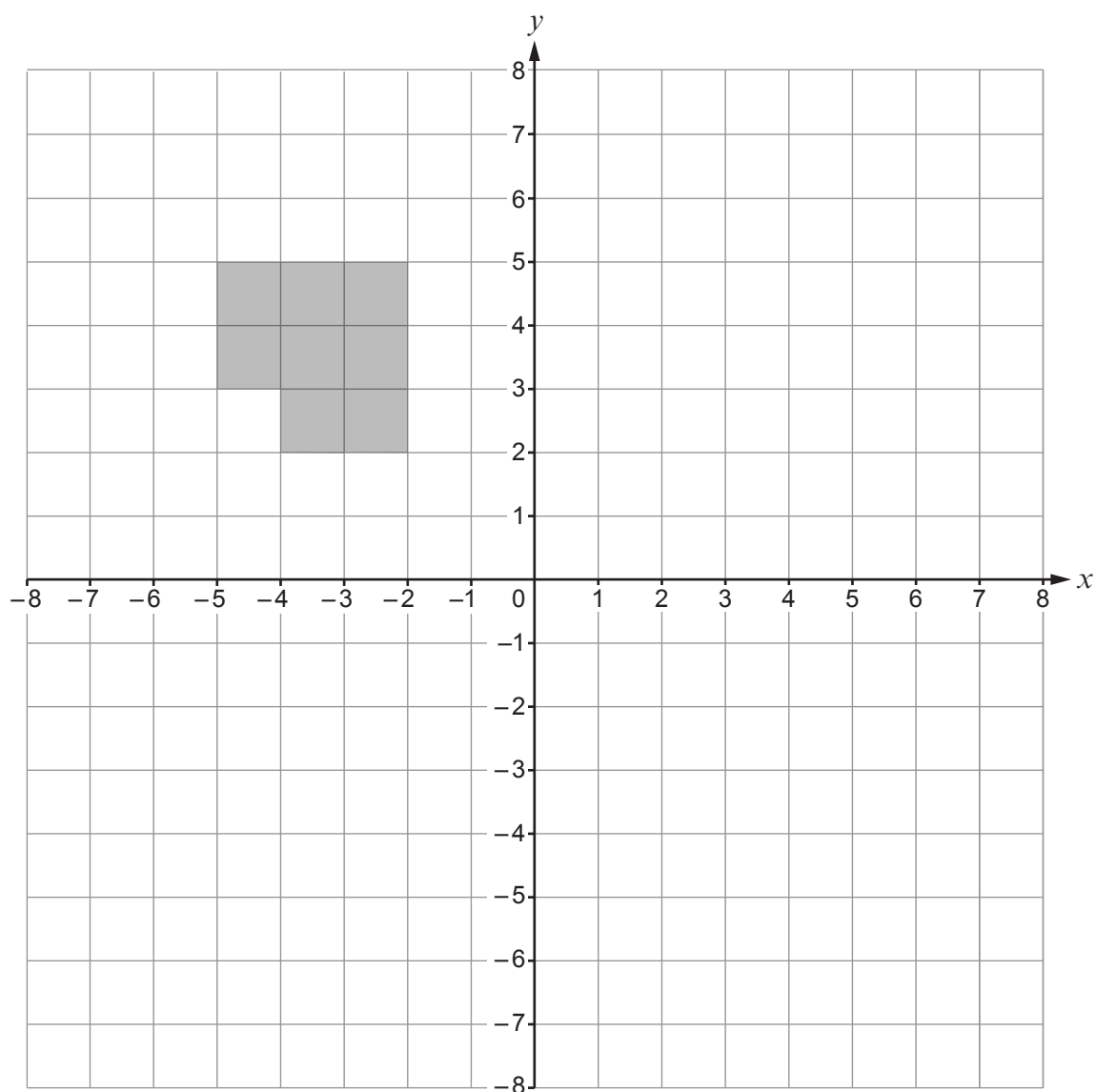
(b)   Rotate the shape below through 90° clockwise about the point (–1, 1).   [2]

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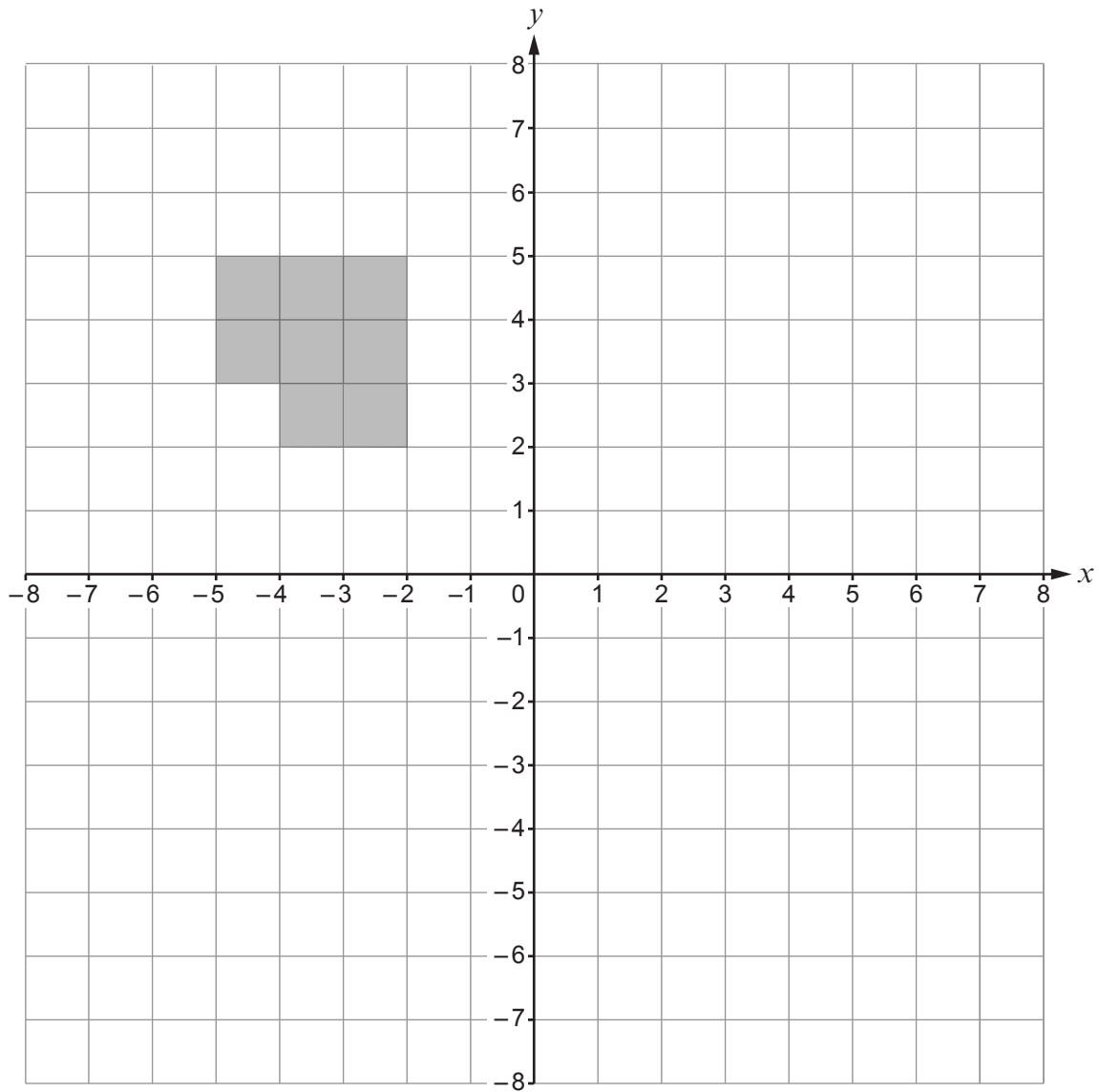
7. (a) Expand $4(3p-5)$. [1]

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(b) Make m the subject of the formula $w = 8m - 3$. [2]

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(c) Expand and simplify $(y + 5)(y - 4)$. [2]

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8. What is the correct name for the relationship between angle a and angle b in the diagram?
Circle your answer. [1]
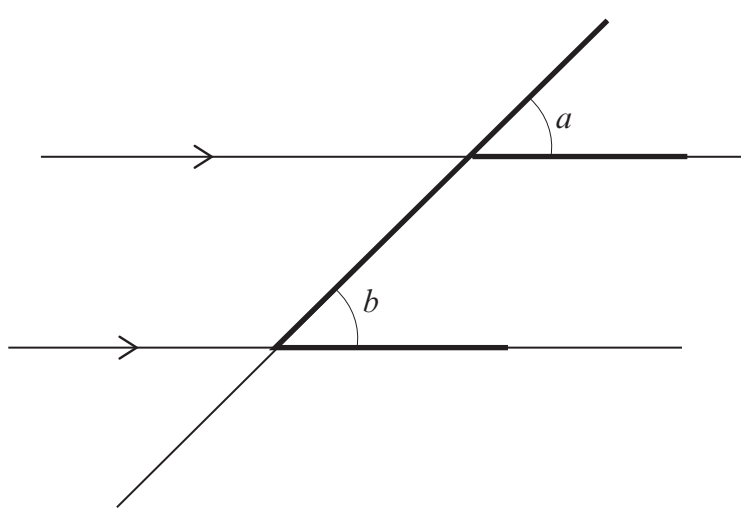
corresponding	alternate	interior	parallel	opposite
angles	angles	angles	angles	angles

9. A car travels 129·5 miles in 3 hours 30 minutes.
Calculate the average speed of the car.
Give your answer in miles per hour. [3]

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10. The height of a cylinder is 24·8 cm.
The ratio of the **diameter** of the cylinder to the height of the cylinder is 3 : 2.

Find the volume of the cylinder.
Give your answer correct to 2 significant figures.
You must show all your working. [5]

11.

A — 12·8 cm — C
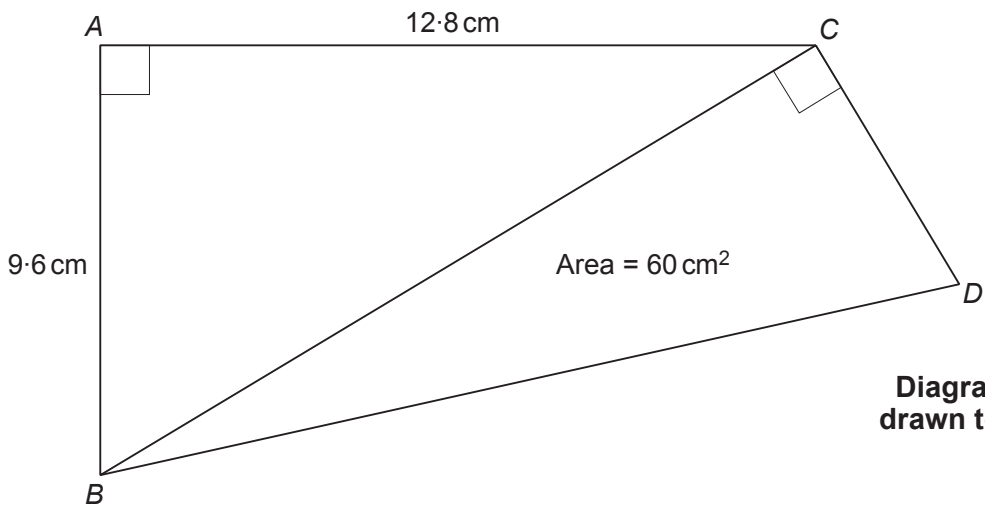
9·6 cm

Area = 60 cm^2

D

B

**Diagram not
drawn to scale**

In the diagram above, the area of triangle *BCD* is 60 cm^2.
Calculate the length of *CD*.
You must show all your working. [6]

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Turn over.

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12. (a) Factorise $8x^2 + 6xy$. [2]

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(b) (i) Factorise $x^2 + 13x + 40$. [2]

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(ii) Explain how you can check that your answer to part (i) is correct. [1]

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13. (a)   The diagram below shows a right-angled triangle.

42°

14·5 cm

x cm
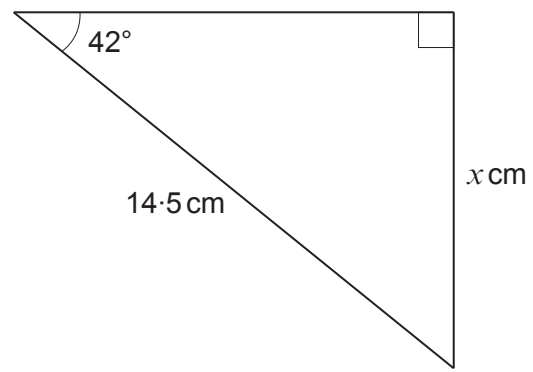
Diagram not drawn to scale

Calculate the value of x.   [3]

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$x =$ ....

(b)   The diagram below shows a different right-angled triangle.

13·5 cm

15·8 cm

$y°$

Diagram not drawn to scale

Calculate the value of y.   [3]

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$y =$ ....

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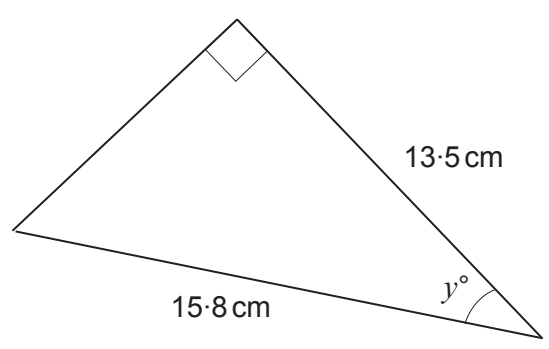
14. This cuboid has:

- length = 5 cm
- width = x cm
- height = $(x^2 + 3)$ cm
- volume = 132 cm^3.

$x^2 + 3$

Diagram not drawn to scale

x

5
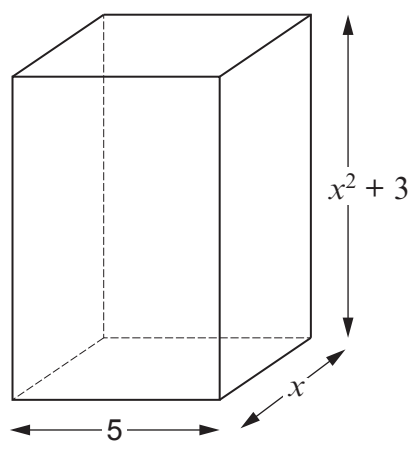
(a) Show that $5x^3 + 15x = 132$. [1]

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(b) (i) A solution of the equation

$$5x^3 + 15x = 132$$

lies between 2 and 3.
Use the method of trial and improvement to find this solution correct to 1 decimal place.
You must show all your working. [4]

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(ii)   Hence, find the height of the cuboid.   [1]

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Height of the cuboid = ... cm

END OF PAPER

Question number	Additional page, if required. Write the question number(s) in the left-hand margin.	Examiner only

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