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| Surname | Centre Number | Candidate Number |
| First name(s) | | 0 |



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 | |

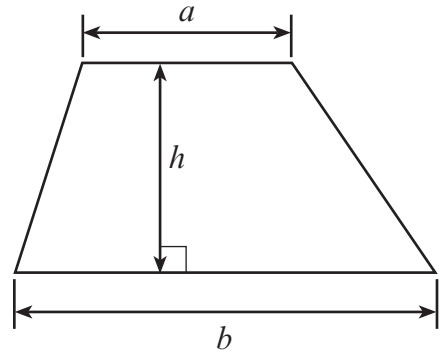
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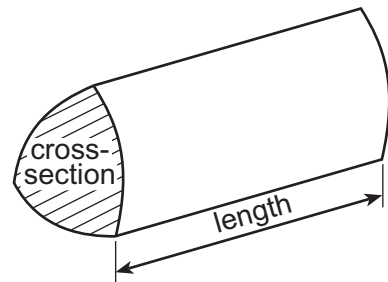
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Formula List – Intermediate Tier

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section \times length



1. Calculate the following.

(a) 3.5% of 159.8

[2]

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(b) $\sqrt{262.44} - \frac{3}{7} \times 24.5$

[2]

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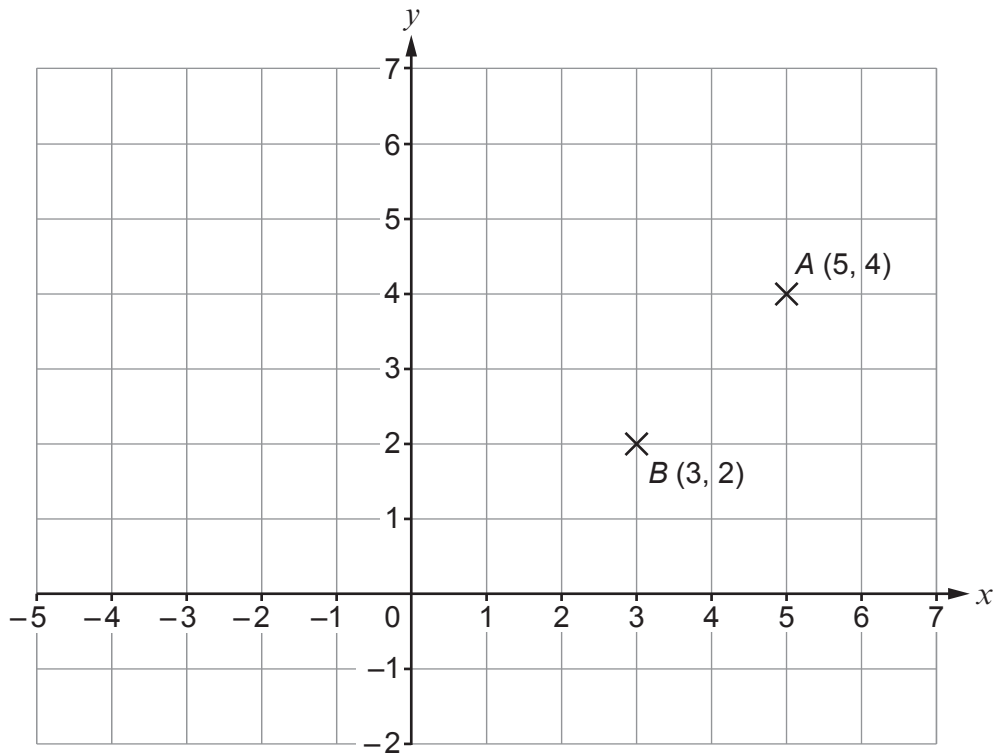
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2.



- (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 (..... ,)



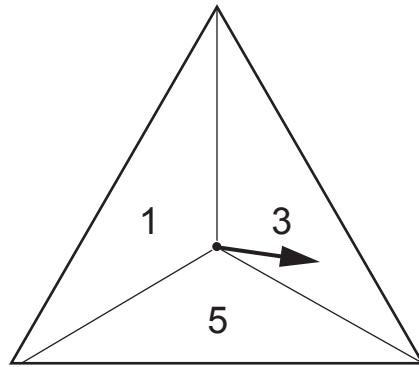
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- 1615 ml

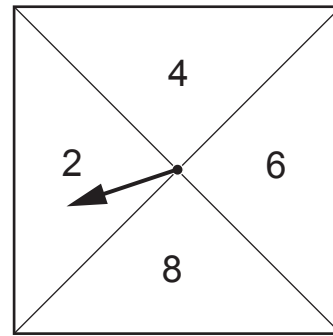
Mean of the three amounts = litres



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 |
| Triangular spinner | 1 | | 4 | | 8 |
| | 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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- Use the answer spaces to clearly identify which is the area and which is the perimeter. [5]

Perimeter = cm



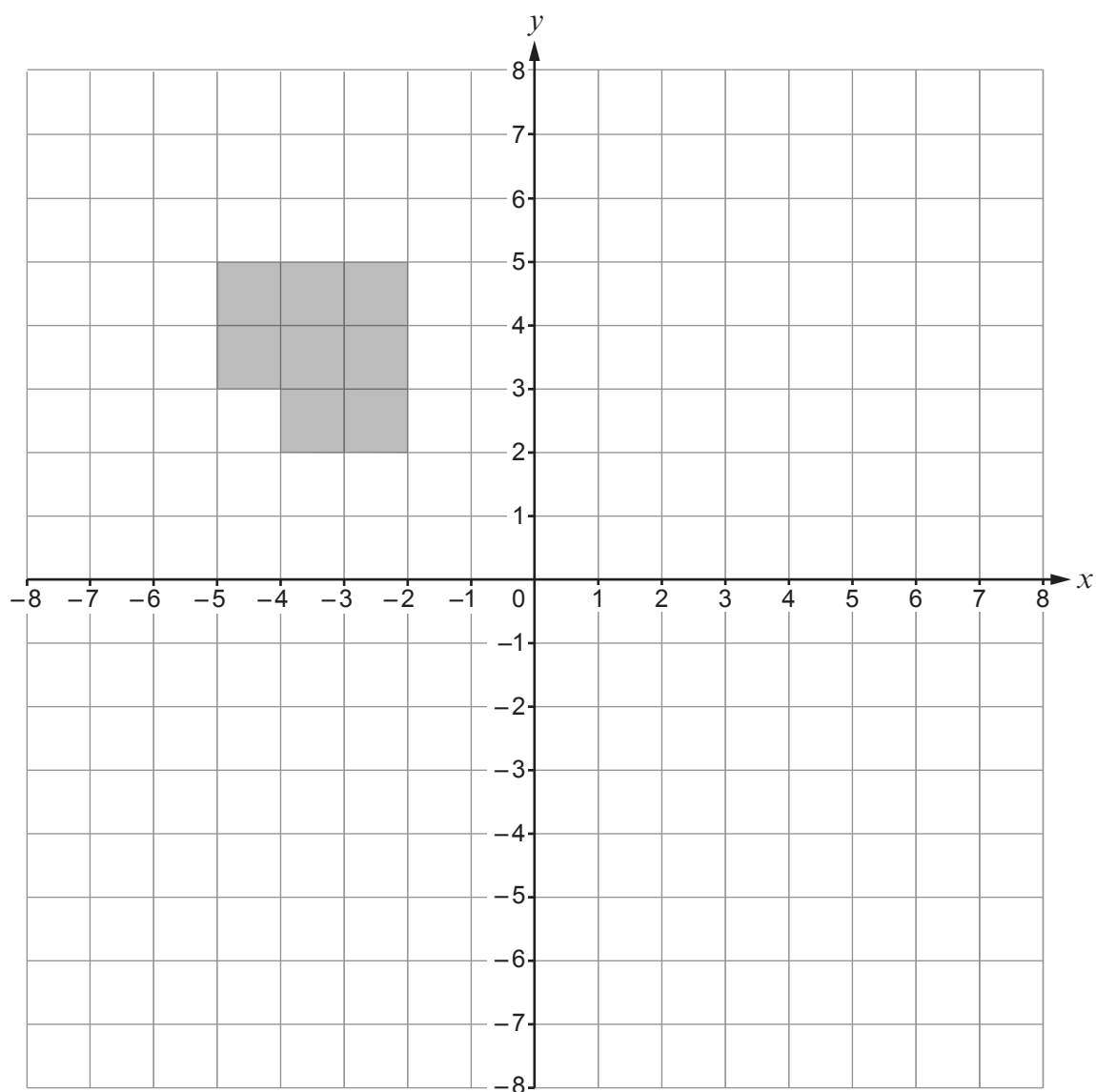
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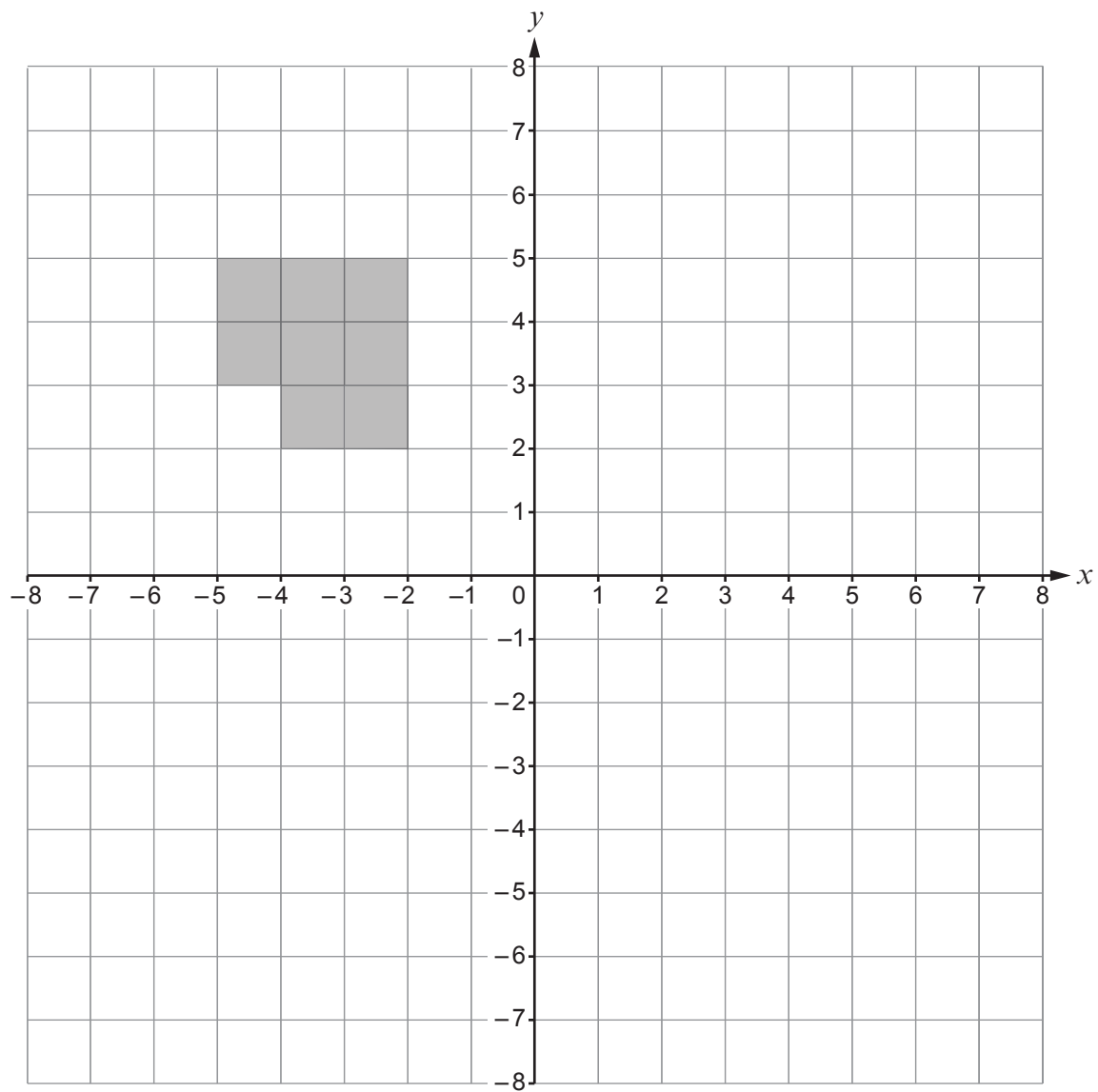
6. (a) Reflect the shape below in the line $x = 1$.

[2]



- (b) Rotate the shape below through 90° clockwise about the point $(-1, 1)$.

[2]



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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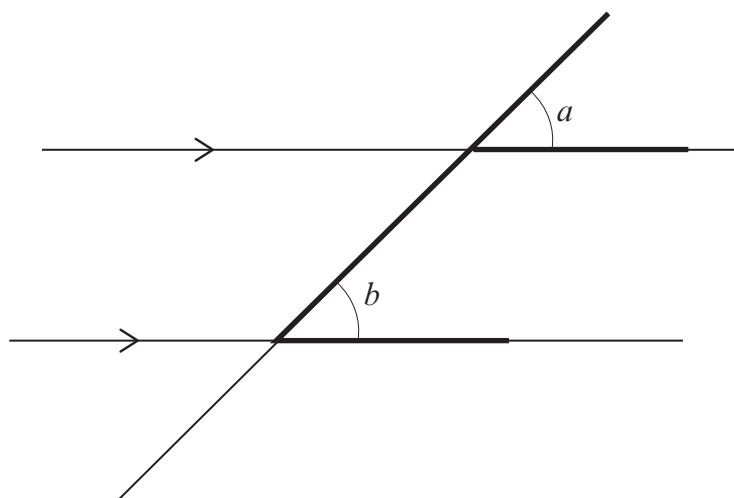
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8. What is the correct name for the relationship between angle a and angle b in the diagram?
Circle your answer.

[1]

corresponding
anglesalternate
anglesinterior
anglesparallel
anglesopposite
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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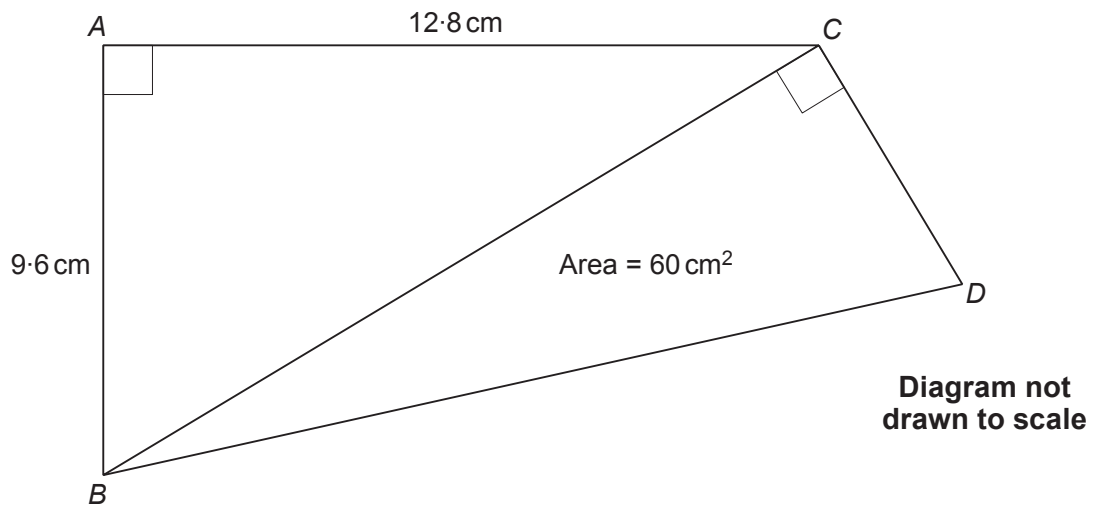
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- Find the volume of the cylinder.
Give your answer correct to 2 significant figures.
You must show all your working.



11.



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]



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]

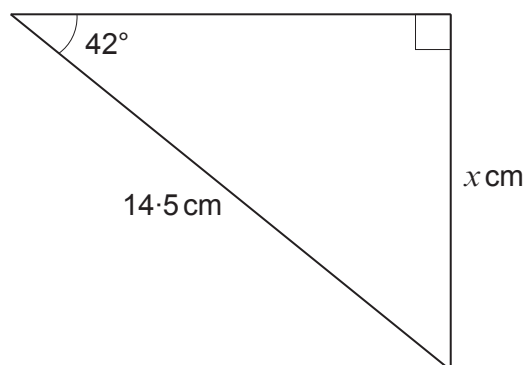
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13. (a) The diagram below shows a right-angled triangle.



**Diagram not
drawn to scale**

Calculate the value of x .

[3]

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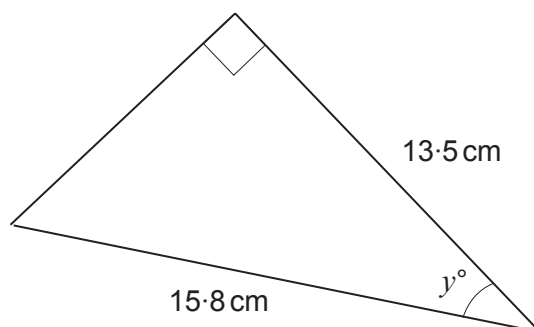
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$$x = \dots\dots\dots$$

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



**Diagram not
drawn to scale**

Calculate the value of y .

[3]

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$$y = \dots\dots\dots$$



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- A 3D diagram of a rectangular prism. The length of the bottom edge is labeled 5. The width of the bottom edge is labeled x . The height of the prism is labeled $x^2 + 3$.

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

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

Use the method of trial and improvement to find this solution correct to 1 decimal place.



(ii) Hence, find the height of the cuboid.

[1]

Examiner
only

Height of the cuboid = cm

END OF PAPER



[illegible]