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|---------------------|--|--|--|--|--|------------------|--|--|--|--|
| Centre Number | | | | | | Candidate Number | | | | |
| Surname | | | | | | | | | | |
| Other Names | | | | | | | | | | |
| Candidate Signature | | | | | | | | | | |



General Certificate of Secondary Education
Foundation Tier
June 2015

Mathematics

43603F

Unit 3 Foundation Tier

Monday 8 June 2015 9.00 am to 10.30 am

F

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|---|--|
| <p>For this paper you must have:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments. | |
|---|--|

Time allowed

- 1 hour 30 minutes

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.
- Do all rough work in this book.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- Quality of your written communication is specifically assessed in Questions 15, 16 and 17. These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

Advice

- In all calculations, show clearly how you work out your answer.

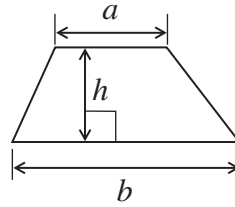
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| For Examiner's Use | |
| Examiner's Initials | |
| Pages | Mark |
| 3 | |
| 4 – 5 | |
| 6 – 7 | |
| 8 – 9 | |
| 10 – 11 | |
| 12 – 13 | |
| 14 – 15 | |
| 16 – 17 | |
| 18 – 19 | |
| 20 – 21 | |
| 22 – 23 | |
| 24 – 25 | |
| 26 – 27 | |
| 28 | |
| TOTAL | |



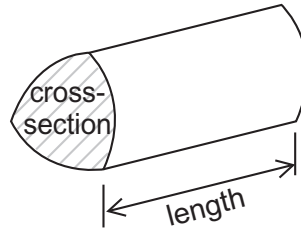
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Formulae Sheet: Foundation Tier

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

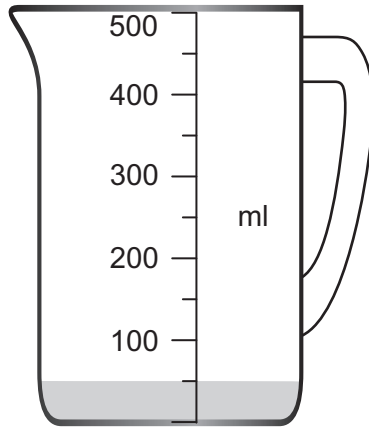


Volume of prism = area of cross-section \times length



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

1 Some water is shown in a 500 ml measuring jug.



1 (a) How much water is in the jug?

[1 mark]

Answer ml

1 (b) 210 ml of water is added to the jug.

On the jug, draw a straight line to show the new water level.

[1 mark]

1 (c) How much water is in the 500 ml jug when it is 80% full?

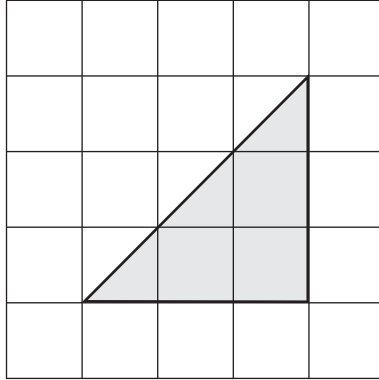
[2 marks]

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Answer ml



2 (a) The diagram shows a triangle on a centimetre grid.



Work out the area of the triangle.

[1 mark]

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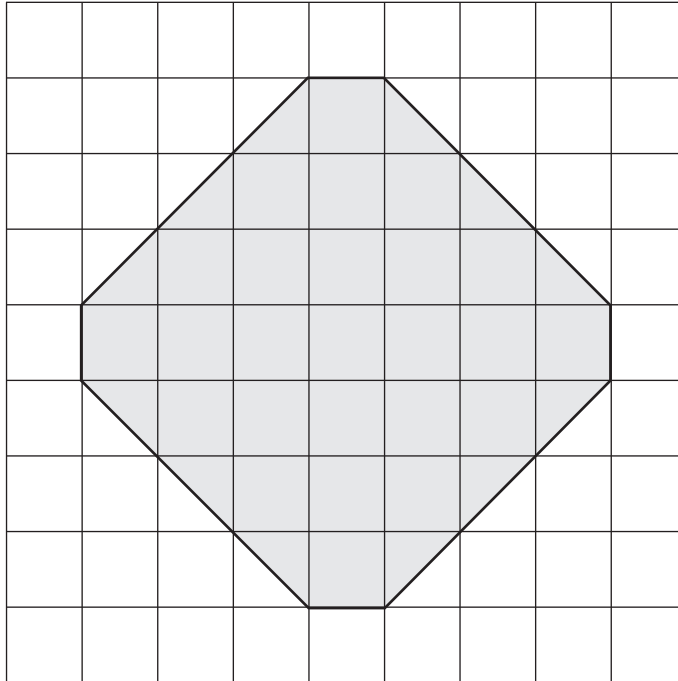
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Answer cm^2



2 (b) The diagram shows a shape on a centimetre grid.



Work out the area of the shape.

[3 marks]

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Answer cm^2



- 3** Two judges record the times of each runner in a race.
The **slower** time for each runner is used as their official time.

| Runner | 1st judge | 2nd judge | Official time |
|--------|---------------------|-------------|---------------|
| Alf | 2 minutes 5 seconds | 123 seconds | seconds |
| Ben | 1 minute 58 seconds | 115 seconds | seconds |
| Carl | 2 minutes 8 seconds | 130 seconds | seconds |
| Dan | 1 minute 54 seconds | 115 seconds | seconds |

- 3 (a)** Complete the table with the official times in **seconds**.

[3 marks]

- 3 (b)** Who won the race?
Circle your answer.

[1 mark]

Alf

Ben

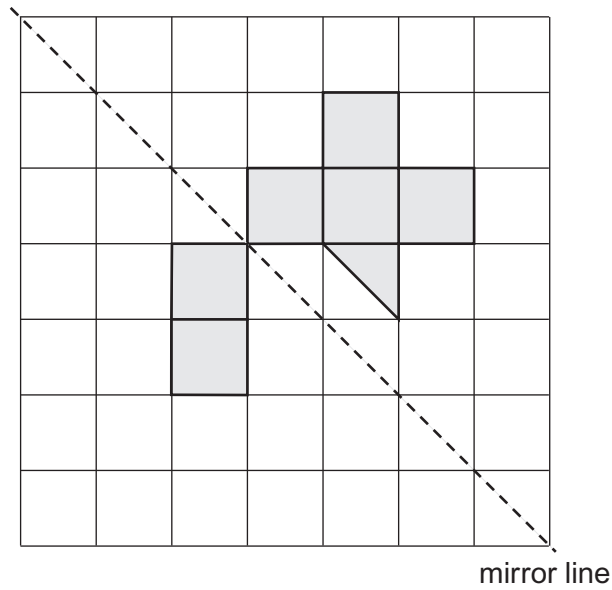
Carl

Dan



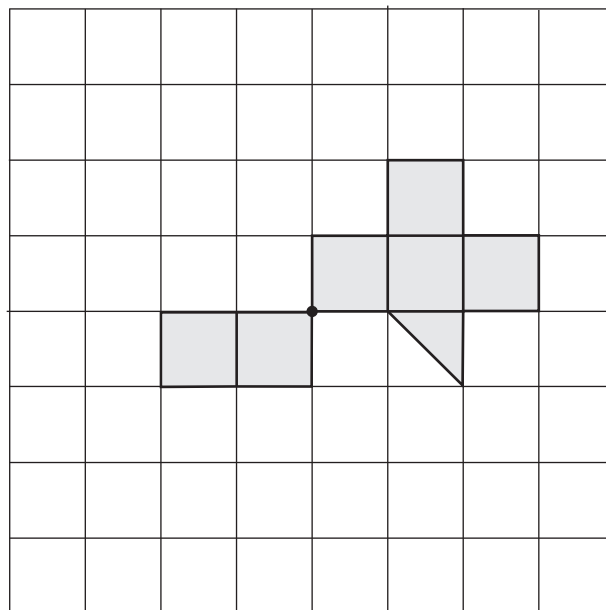
- 4 (a) Shade **two more** squares and **one more** triangle so that the diagram has reflective symmetry about the mirror line.

[2 marks]



- 4 (b) Shade **two more** squares and **one more** triangle so that this diagram has rotational symmetry of order 2

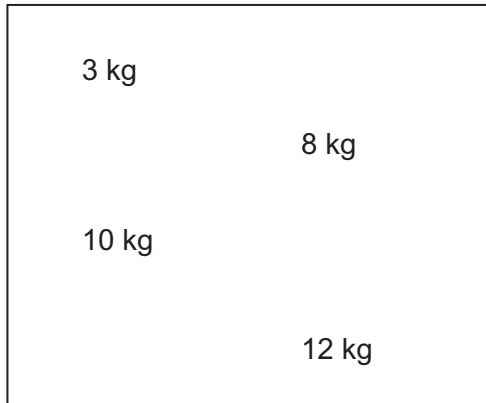
[2 marks]



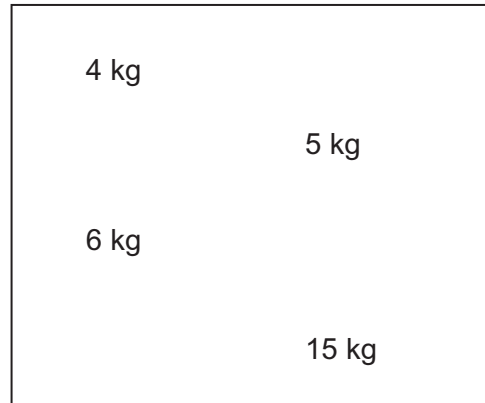
5 (a)

The diagram shows Box A and Box B.
Each box holds four weights.

Box A



Box B



One of the weights is taken out of Box A.
The boxes now weigh the same.

Which weight is taken out?
Circle your answer.

[1 mark]

3 kg

8 kg

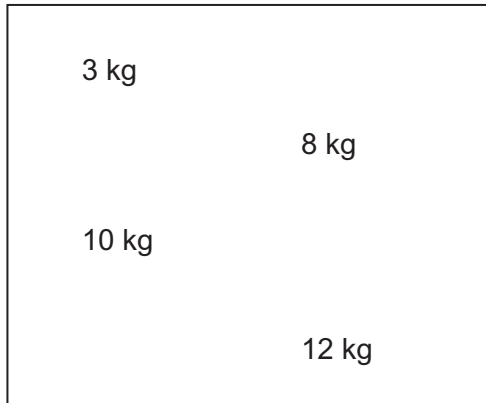
10 kg

12 kg

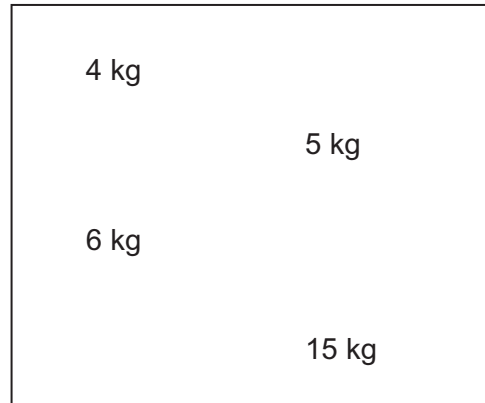


5 (b) Here are the two boxes again.

Box A



Box B



One of the weights is moved from Box A to Box B.
The total weight in Box B is now double the total weight in Box A.

Which weight is moved?
Circle your answer.

[1 mark]

3 kg

8 kg

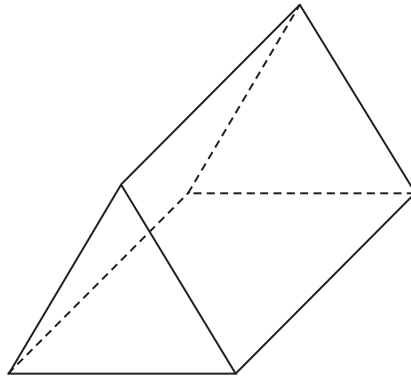
10 kg

12 kg

Turn over for the next question



6 (a) The diagram shows a triangular prism.



Write down the number of faces, edges and vertices.

[3 marks]

Faces

Edges

Vertices

6 (b) The volume of the prism is 40 cm^3

Will the prism fit inside an empty cube with volume 125 cm^3 ?

Tick a box.

Yes

No

Cannot tell

Give a reason for your answer.

[2 marks]

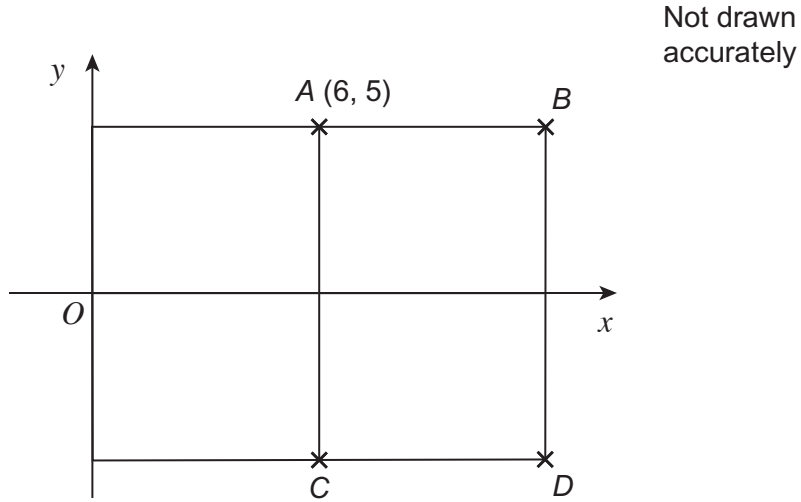
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7 Four identical small rectangles are joined together to make a large rectangle. A is the point (6, 5)



Work out the coordinates of B, C, and D.

[3 marks]

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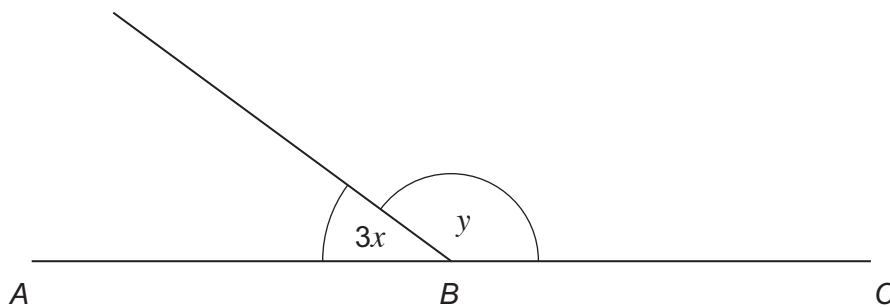
B (..... ,)

C (..... ,)

D (..... ,)



8 (a) ABC is a straight line.



Not drawn
accurately

Work out the value of y when $x = 15^\circ$

[2 marks]

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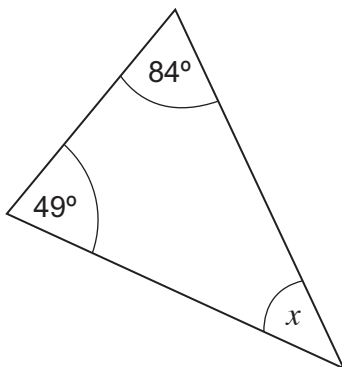
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Answer degrees

8 (b) Work out the size of angle x .

[2 marks]



Not drawn
accurately

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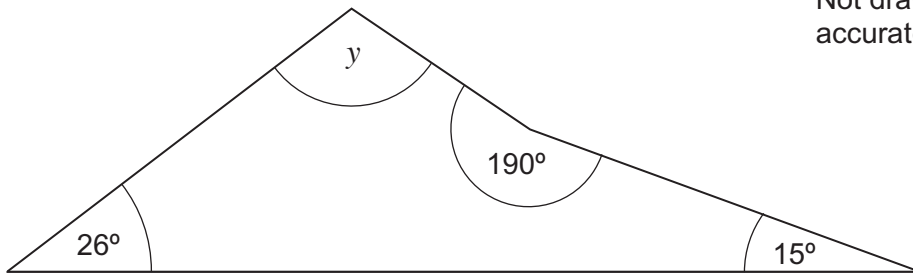
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Answer degrees



8 (c) Work out the size of angle y .

[2 marks]



Not drawn
accurately

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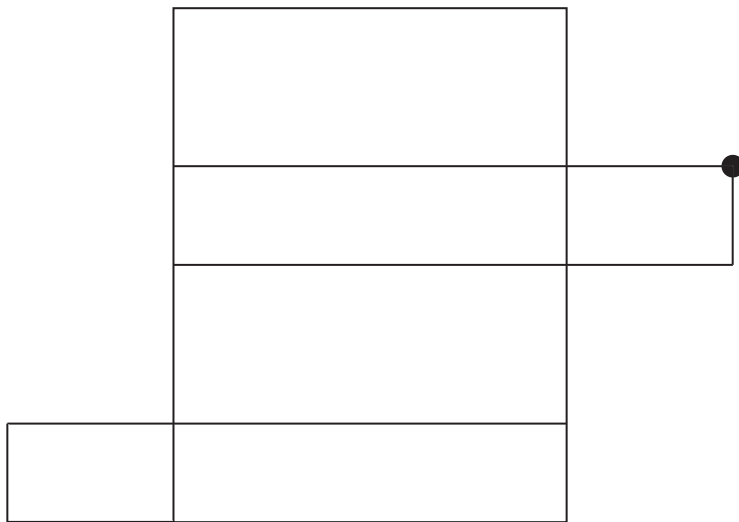
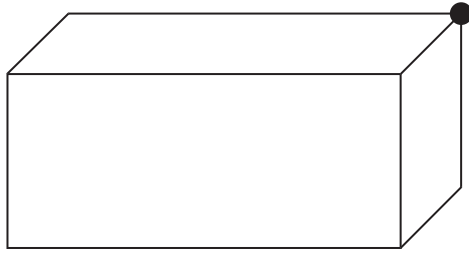
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Answer degrees

Turn over for the next question



- 9 The diagrams show a cuboid and its net.
A dot is shown at one vertex.



- 9 (a) On the net, draw **two more** dots to show the points that meet with the dot shown when the cuboid is made.

[2 marks]



9 (b) In this cuboid

$$\text{length} = \text{width} + \text{height}$$

The length of the cuboid = 7 cm

Work out the total length of all the edges of the cuboid.

[3 marks]

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Answer cm

Turn over for the next question

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|---|
| 5 |
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Turn over ►



10 The table shows stopping distance for a car when braking.

| Speed (mph) | Stopping distance (metres) |
|-------------|----------------------------|
| 20 | 12 |
| 30 | 23 |
| 40 | 36 |
| 50 | 53 |
| 60 | 73 |

10 (a) Plot this data on the grid opposite.
Join your points with a smooth curve.

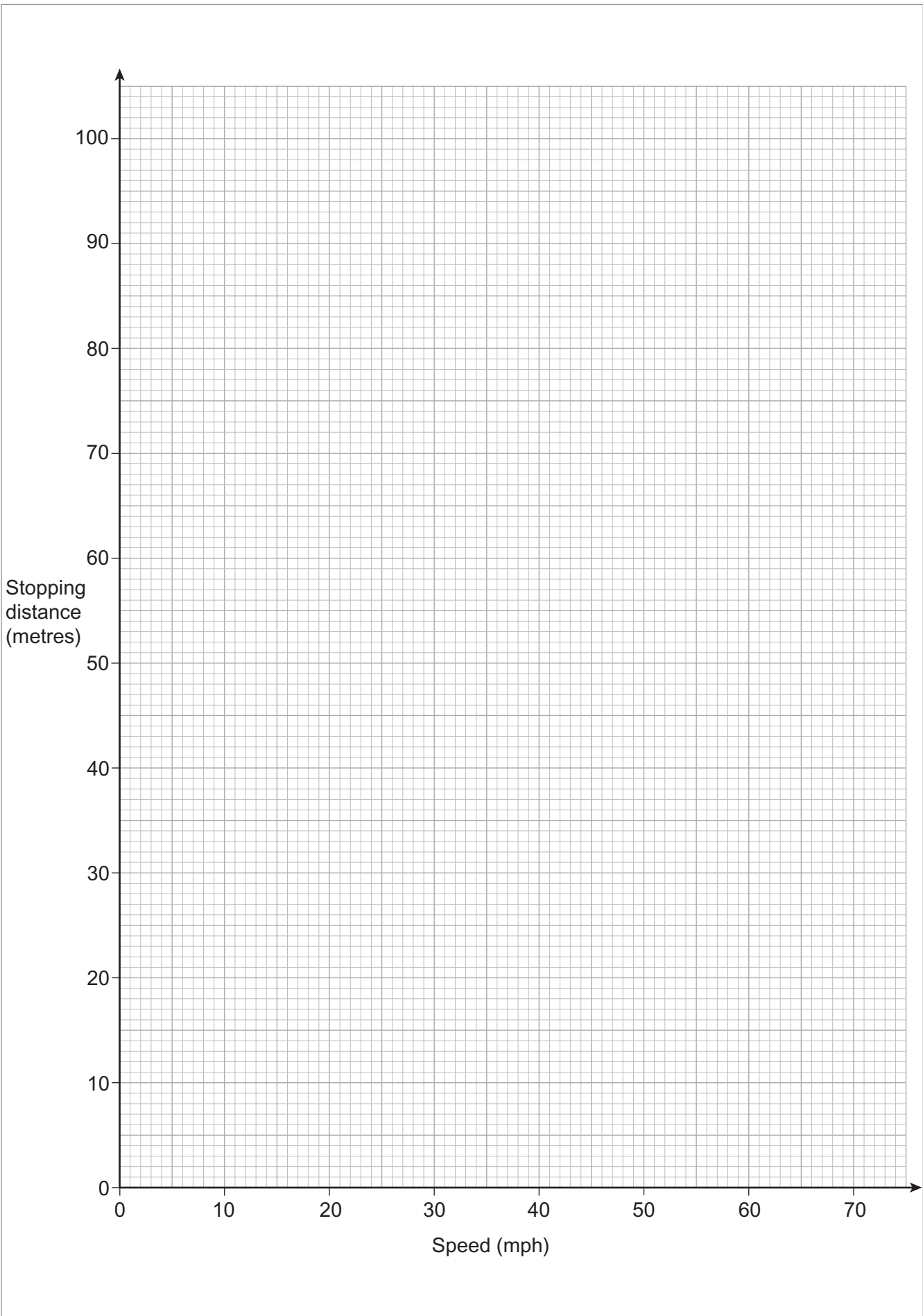
[2 marks]

10 (b) Extend your smooth curve to estimate the stopping distance at 70 mph

[2 marks]

Answer metres





4

Turn over ►



- 11 (a)** Match the scales that are the same.
The first one has been done for you.

[2 marks]

1 cm to 1 m

1 : 50

1 cm to 5 m

1 : 100

2 cm to 1 m

1 : 200

1 cm to 2 m

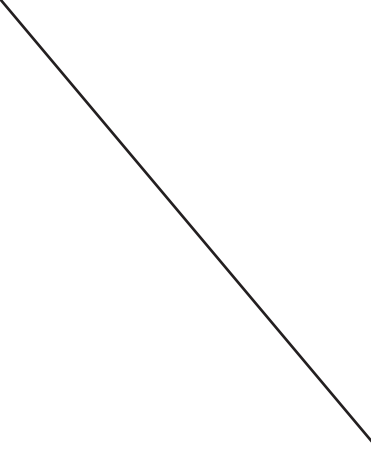
1 : 500



11 (b) Match the bearings that are the same.
The first one has been done for you.

[3 marks]

| | |
|------------|------|
| | 045° |
| South | 090° |
| West | 135° |
| North-east | 180° |
| South-east | 225° |
| | 270° |

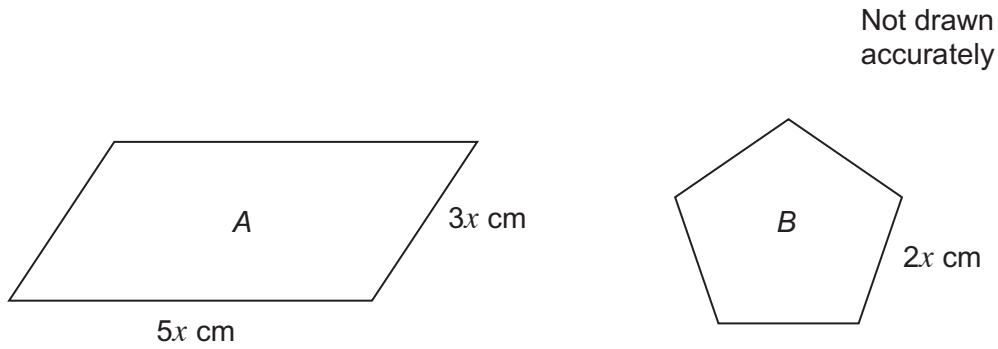


5

Turn over ►



12 The diagram shows parallelogram *A* and regular pentagon *B*.



Work out the ratio Perimeter *A* : Perimeter *B*

Simplify your answer.

[4 marks]

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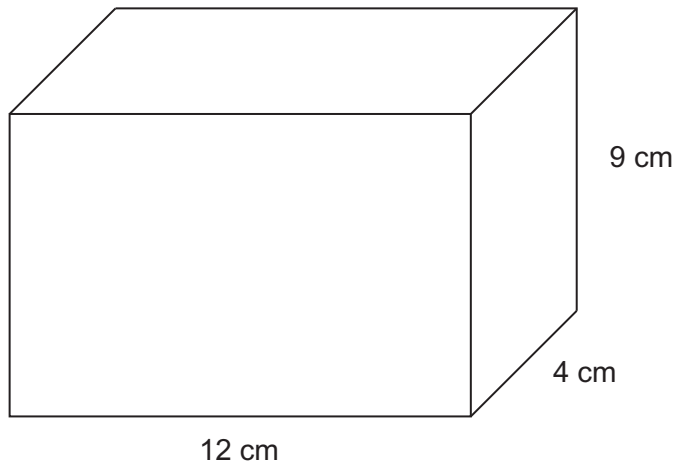
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Answer :



13



Work out the volume of the cuboid.
State the units of your answer.

[3 marks]

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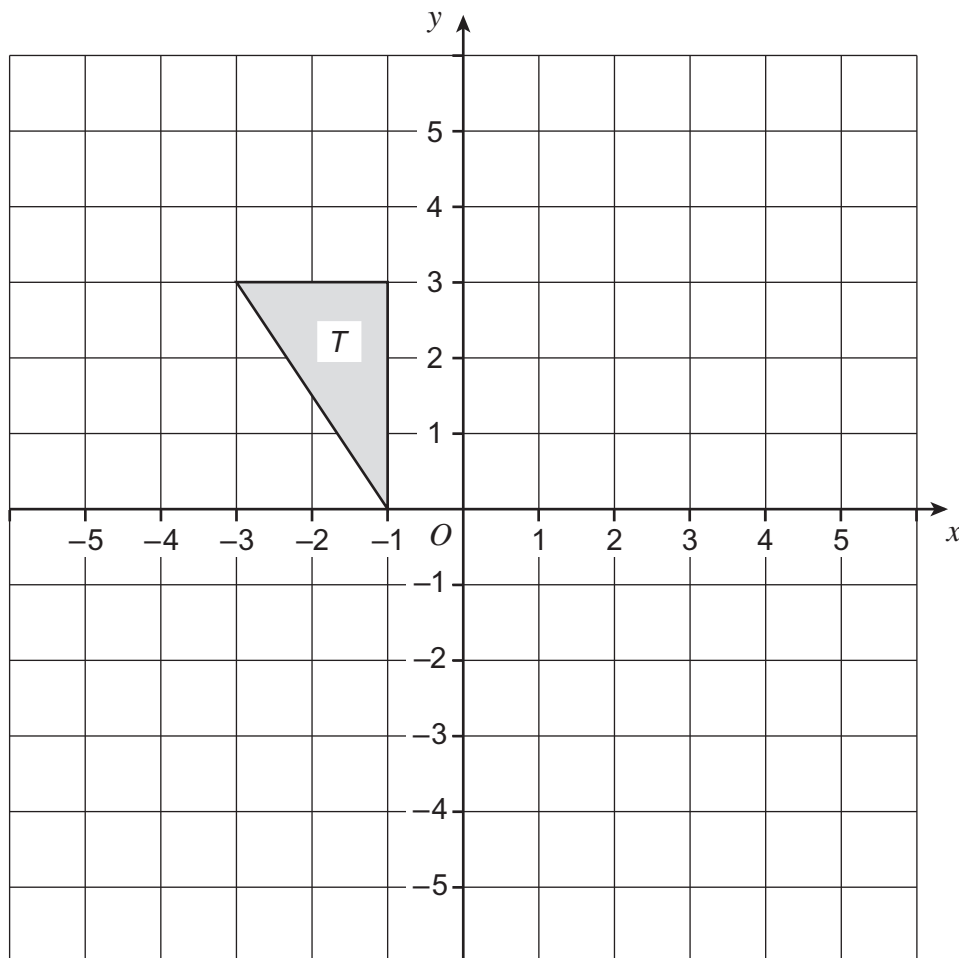
Answer

Turn over for the next question



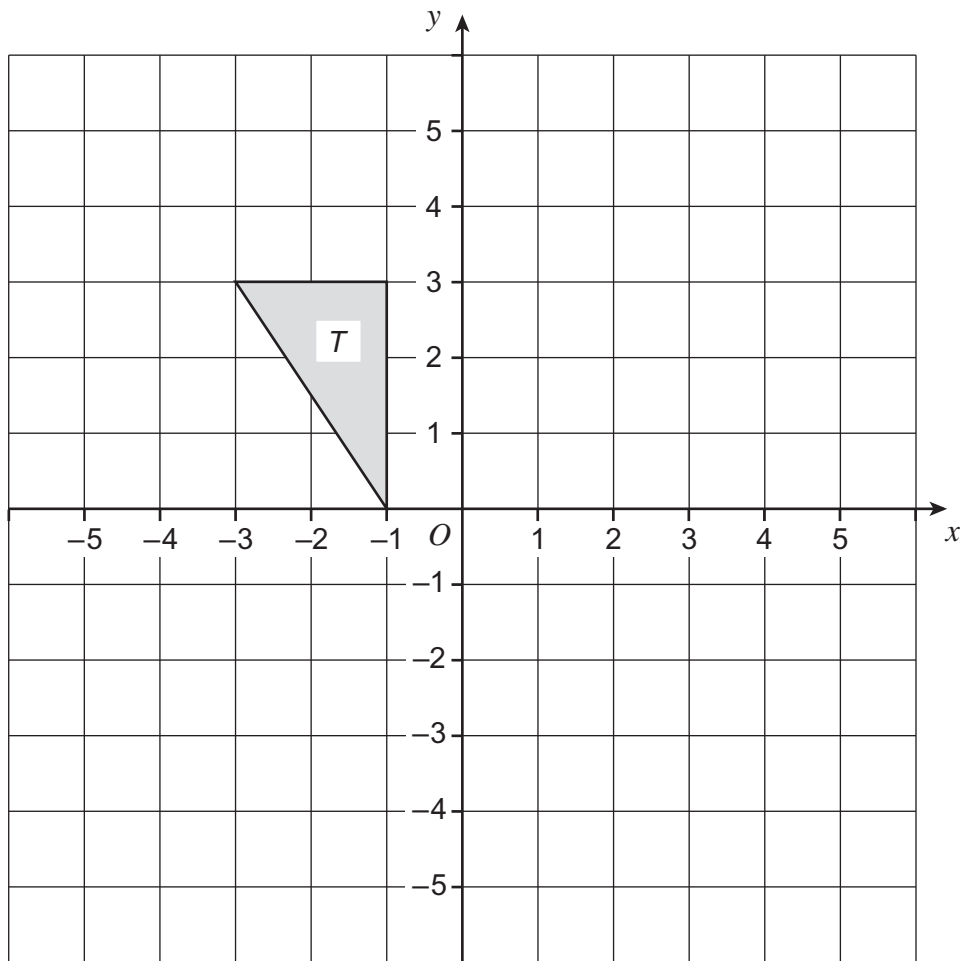
14 (a) Translate triangle T by the vector $\begin{pmatrix} 4 \\ -5 \end{pmatrix}$

[2 marks]



14 (b) Reflect triangle T in the line $y = -1$

[2 marks]



Turn over for the next question

Turn over ►



***15** A company claims the following miles per gallon for two cars.

| | |
|--------------|---------------------|
| Car A | 68 miles per gallon |
| Car B | 55 miles per gallon |

The driver of car A
gets 30% **fewer** miles per gallon than claimed
and drives 15 000 miles.

The driver of car B
gets three-quarters of the miles per gallon claimed
and drives 12 000 miles.

Which driver uses more fuel?
You **must** show your working.

[5 marks]

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Answer



16 A wheel has diameter 0.7 m

16 (a) Work out the circumference.

[2 marks]

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Answer m

*16 (b) Work out the number of complete turns when the wheel travels 1.6 km
You **must** show your working.

[4 marks]

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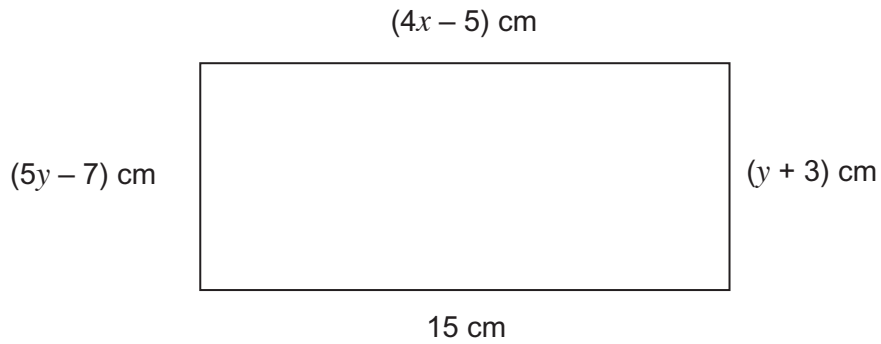
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Answer



- 17 The diagram shows a rectangle.



Not drawn
accurately

- *17 (a) Set up and solve an equation to work out the value of x .

[3 marks]

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$x =$



17 (b) Work out the area of the rectangle.

[5 marks]

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Answer cm²

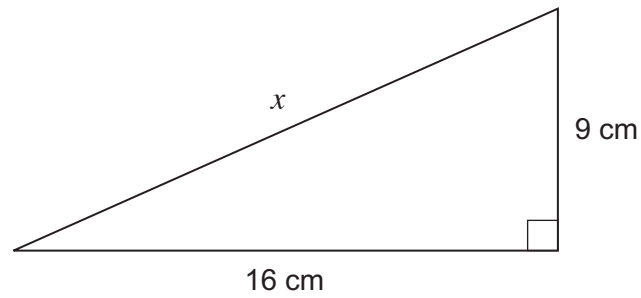
Turn over for the next question

8

Turn over ►



18

Not drawn
accurately

Work out the length x .
Give your answer to 1 decimal place.

[4 marks]

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Answer cm

END OF QUESTIONS