Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4 – 5	
6 – 7	
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10 – 11	
12 – 13	
14 – 15	
16 – 17	
18 – 19	
20 – 21	
22	
TOTAL	

General Certificate of Secondary Education
Foundation Tier
June 2012

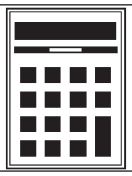
Mathematics 43603F

Unit 3

Wednesday 13 June 2012 9.00 am to 10.30 am

F

For this paper you must have:
- 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.

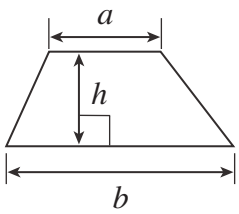
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- The quality of your written communication is specifically assessed in Questions 8 and 11. These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

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

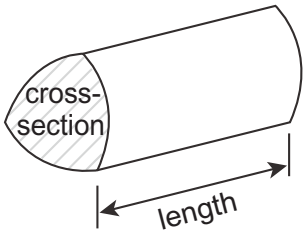
Formulae Sheet: Foundation Tier

You may need to use the following formulae:

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



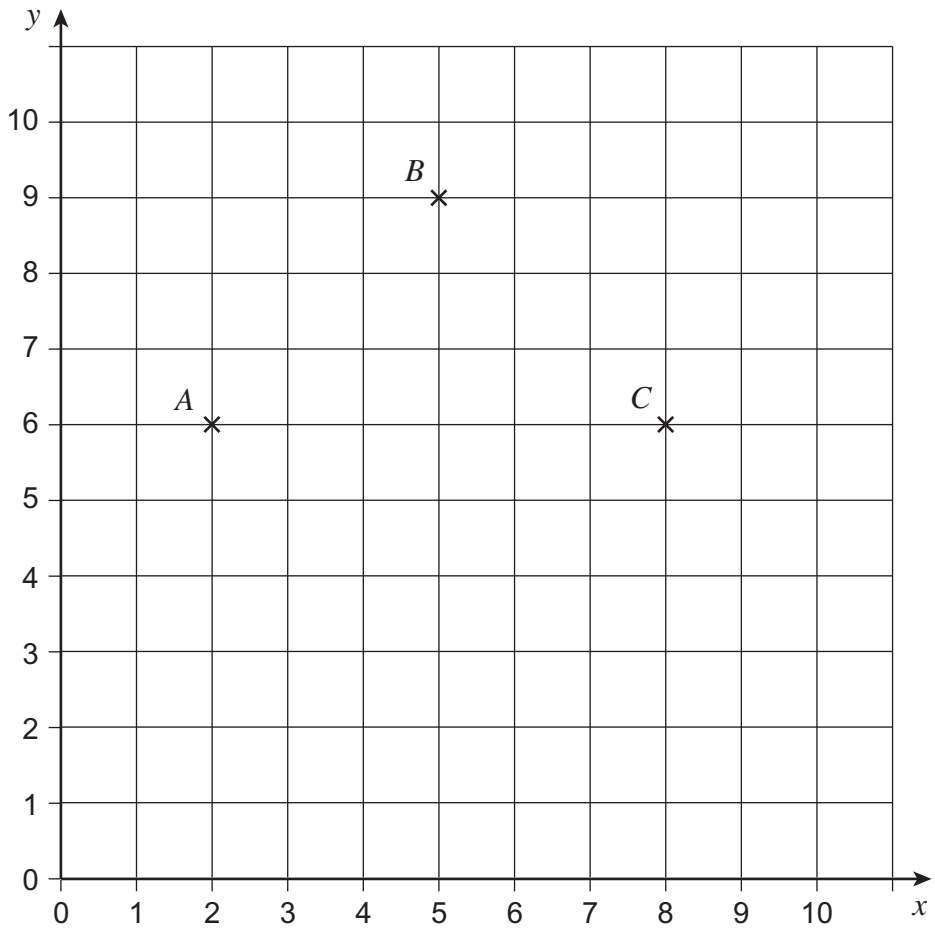
Volume of prism = area of cross-section × length



Do not write outside the box

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

1 Here is a centimetre–square grid with points A, B and C plotted.



1 (a) Write down the coordinates of A.

Answer (..... , ...) *(1 mark)*

1 (b) Plot the point D so that $ABCD$ is a square.

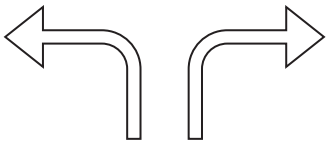
(1 mark)

2

Do not write outside the box

2 In each part, decide whether the diagram shows a reflection, a rotation or a translation. Circle your answer.

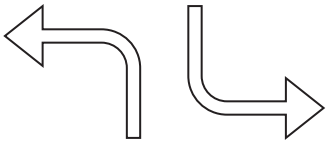
2 (a)



Reflection Rotation Translation

(1 mark)

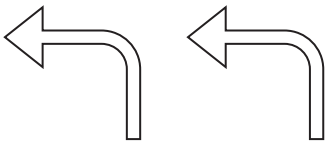
2 (b)



Reflection Rotation Translation

(1 mark)

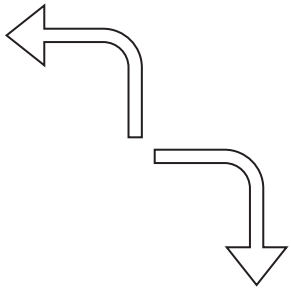
2 (c)



Reflection Rotation Translation

(1 mark)

2 (d)

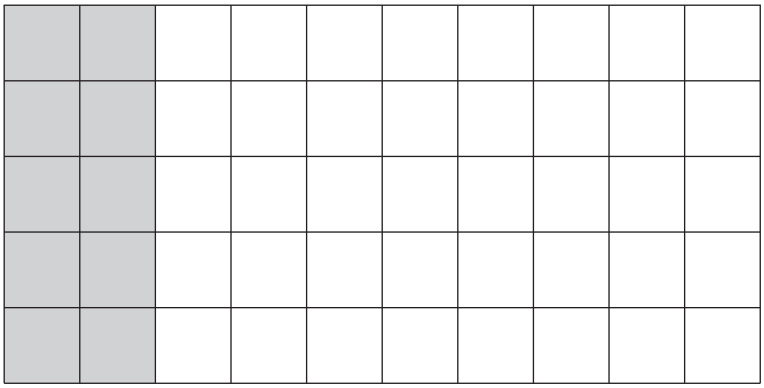


Reflection Rotation Translation

(1 mark)

Do not write outside the box

3



3 (a) What fraction of the grid is shaded?
Give your answer in its simplest form.

.....

.....

Answer ..... *(2 marks)*

3 (b) How many **more** squares need to be shaded so that 60% of the grid is shaded?

.....

.....

.....

.....

Answer ..... *(3 marks)*

9

Do not write outside the box

4 (a) Measure the length of line AB.

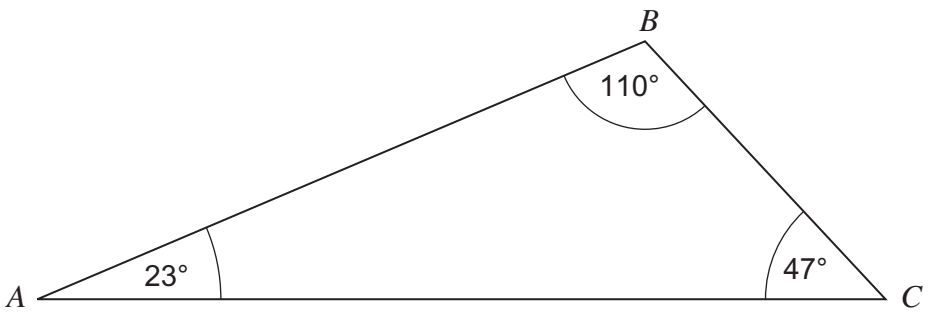
Answer ..... cm *(1 mark)*

4 (b) Mark the midpoint of line CD with a cross ($\times$).

(1 mark)

Do not write outside the box

5 The diagram shows a triangle ABC.



5 (a) Circle the correct word to describe triangle ABC.

Scalene Isosceles Equilateral

(1 mark)

5 (b) Circle the correct word to describe angle B.

Acute Obtuse Reflex

(1 mark)

Turn over for the next question

4

Do not write outside the box

6 (a) One cubic metre (m^3) of concrete weighs 2.4 tonnes.
A base for a shed uses 3.8 m^3 of concrete.

Work out how much this concrete weighs.

.....

.....

Answer ..... tonnes *(2 marks)*

6 (b) A base for a garage uses 12.5 tonnes of concrete.
A lorry delivers ready-mixed concrete in loads of 14 tonnes.

How many of these bases can be built with 10 loads of concrete?

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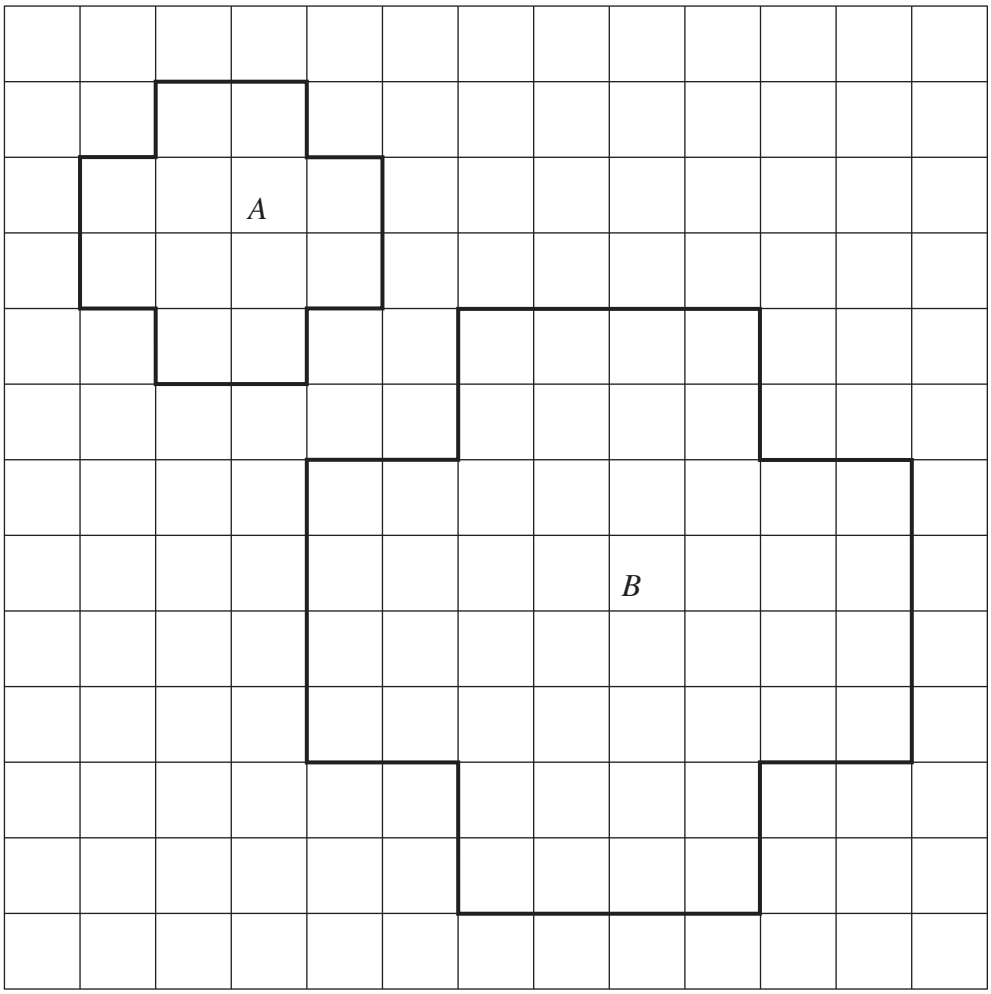
Answer ..... *(3 marks)*

Do not write outside the box

7 Shape A and shape B are drawn on a centimetre grid.



7 (a) Work out the area of shape A.
State the units of your answer.

.....

Answer ..... *(2 marks)*

7 (b) Shape B is an enlargement of shape A.

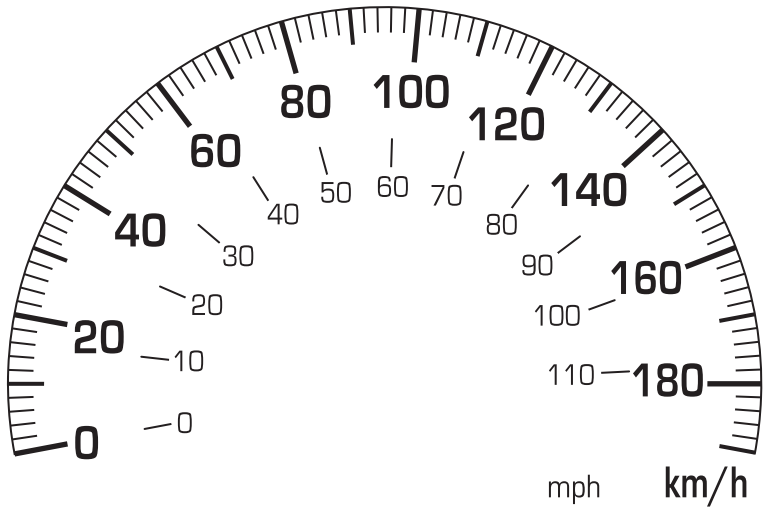
Write down the scale factor of the enlargement.

Answer ..... *(1 mark)*

8

Do not write outside the box

***8** The diagram shows a speedometer on a car bought in France.



8 (a) The speed limit on a road in France is 110 kilometres per hour (km/h).

Use the speedometer to estimate this speed in miles per hour (mph).

Answer ..... mph *(1 mark)*

8 (b) The speed limit on a road in England is 30 mph.

Use the speedometer to estimate this speed in km/h.

Answer ..... km/h *(1 mark)*

Do not write outside the box

8 (c) Marie has 56 litres of diesel in her car.
The car uses 1 litre of diesel for every 19 kilometres travelled.

She wants to drive to Paris, a distance of 1100 kilometres.

Does she have enough diesel for the journey?

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.....

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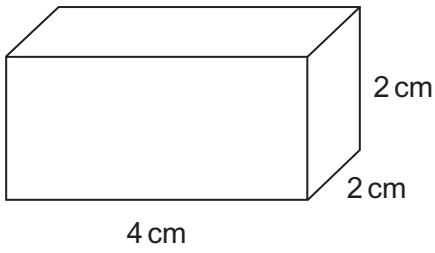
(3 marks)

Turn over for the next question

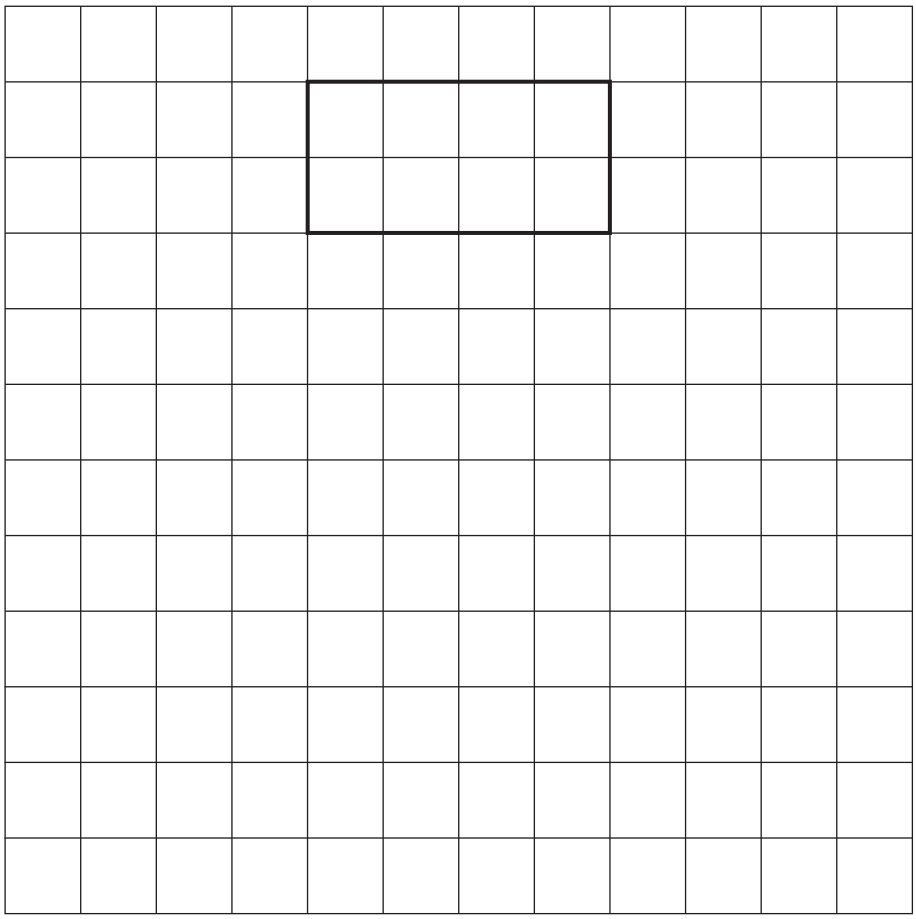
5

Do not write outside the box

9 The diagram shows a cuboid.



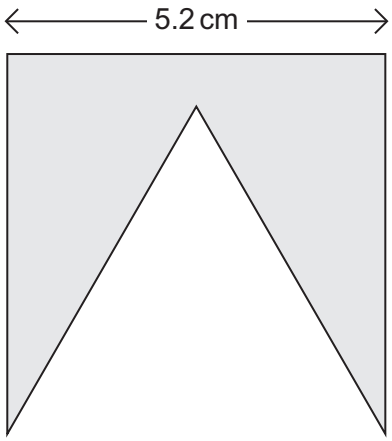
On the centimetre grid, complete a possible net for the cuboid.
One face has been drawn for you.



(3 marks)

Do not write outside the box

10 This shape is made by cutting out an equilateral triangle from a square.



Not drawn accurately

Work out the perimeter of the shape.

.....

.....

Answer ..... cm *(2 marks)*

Turn over for the next question

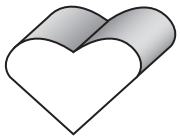
5

Do not write outside the box

***11** The diagram shows two different sweets and their weights.

8 grams

A



12 grams

B

The sweets are sold in bags.
Each bag contains 120 grams of sweets.

11 (a) How many of sweet A are needed to fill one bag?

.....

Answer ..... *(2 marks)*

11 (b) A 120-gram bag is filled with the same number of each sweet.

How many of each sweet are in the bag?

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Answer ..... *(3 marks)*

Do not write outside the box

11 (c) The 120-gram bags are put into boxes.
The total weight of the bags in each box is 6 kilograms.

How many bags are in each box?

.....

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.....

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Answer ..... *(3 marks)*

11 (d) The 120-gram bags are sold for £1.99 each.
The sweets are also sold loose at 100 grams for £1.59

Which is better value?
You **must** show your working.

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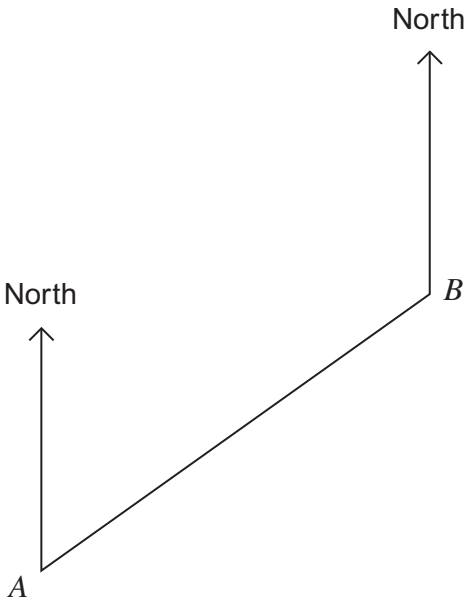
(3 marks)

11

Do not write outside the box

12 A and B are two towns.



12 (a) Measure the bearing of B from A.

Answer ..... ° *(1 mark)*

12 (b) Natasha says, "To work out a bearing in the opposite direction,

add 180° to the original bearing."

Use your answer to part (a) and Natasha's method to work out the bearing of A from B.

.....

.....

Answer ..... ° *(2 marks)*

12 (c) Give a reason why Natasha's method can only be used for bearings up to 180°.

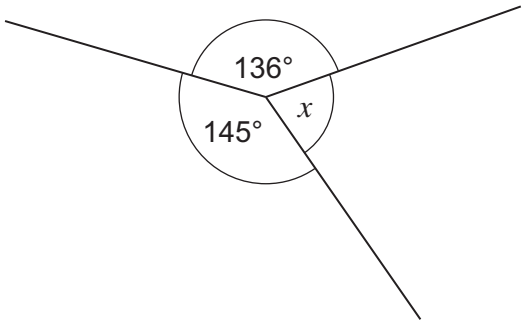
.....

.....

(1 mark)

Do not write outside the box

13 (a) The diagram shows three angles at a point.



Not drawn accurately

Work out the value of x.

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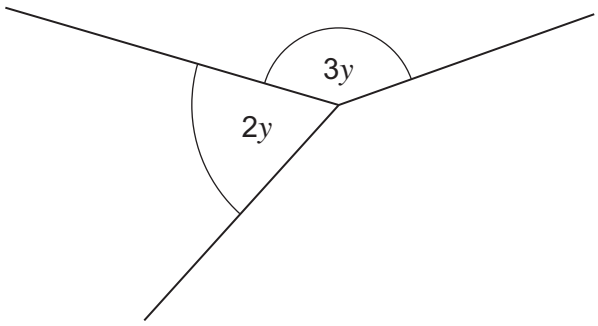
Answer ..... degrees *(2 marks)*

13 (b) This diagram also shows three angles at a point.



Not drawn accurately

Work out the missing angle in terms of y.
Give your answer in its simplest form.

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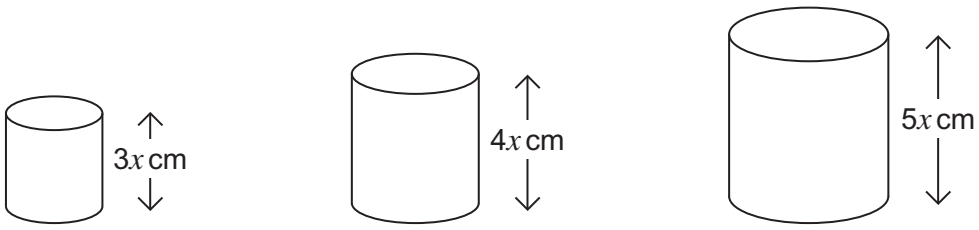
Answer ..... degrees *(2 marks)*

8

Turn over ▶

Do not write outside the box

14 Three cylinders are shown.



The sum of the three heights is 48 cm.

Work out the height of the tallest cylinder.

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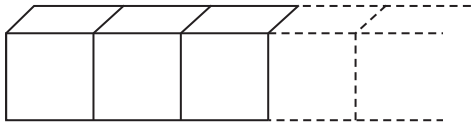
Answer ..... cm *(4 marks)*

15 A shape is made by joining centimetre cubes together in a row as shown.



The surface area of the shape is 34 cm^2.

Work out the number of cubes used to make the shape.

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Answer ..... *(3 marks)*

Do not write outside the box

16 Work out the area of a circle of radius 6 m.

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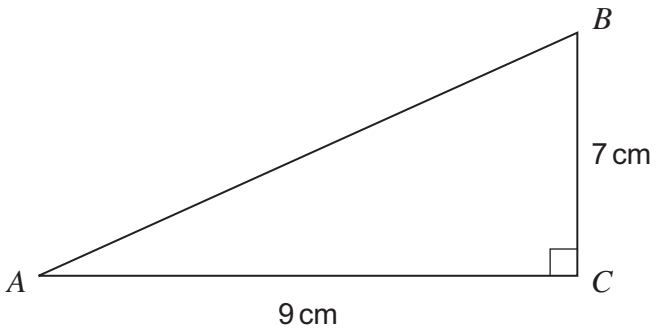
Answer ..... m^2 *(2 marks)*

17 Work out length AB as a decimal.



Not drawn accurately

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Answer ..... cm *(3 marks)*

12

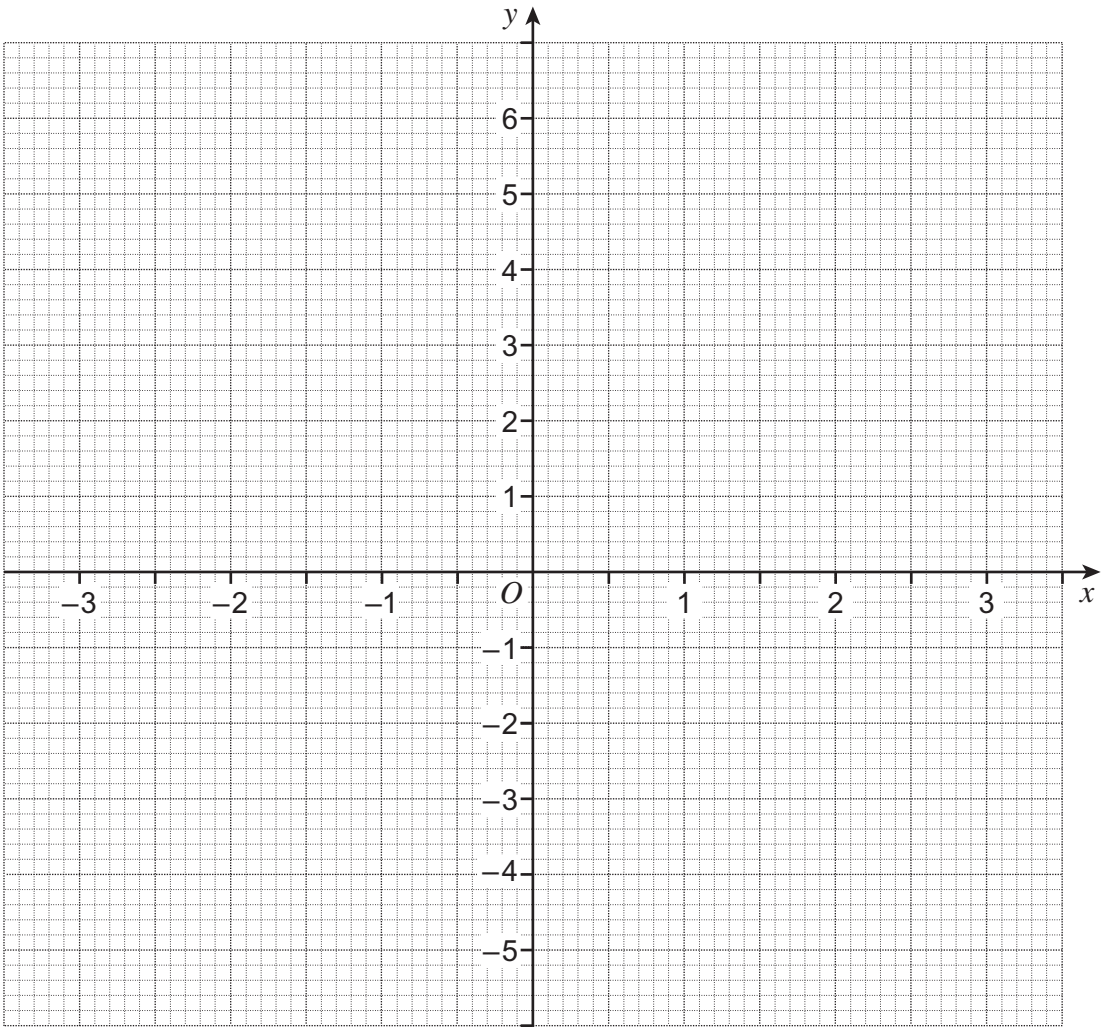
Do not write outside the box

18 (a) Complete the table of values for $y = x^2 - 4$

x	–3	–2	–1	0	1	2	3
y	5	0	–3			0	

(2 marks)

18 (b) Draw the graph of $y = x^2 - 4$ for values of x from –3 to 3.



(3 marks)

Do not write outside the box

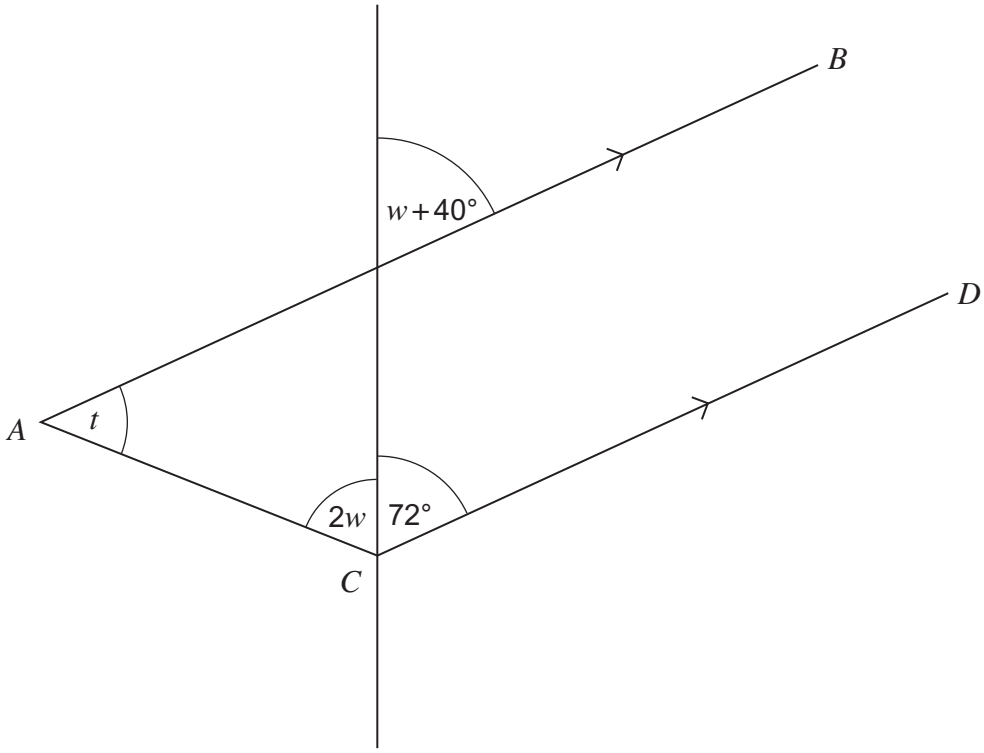
18 (c) Draw the graph of $y = 2$ on the grid opposite for values of x from –3 to 3.

(1 mark)

18 (d) Write down the x-coordinates of the points of intersection of the two graphs.

Answer ..... and ..... *(2 marks)*

19 AB is parallel to CD.



Not drawn accurately

Work out the value of t.

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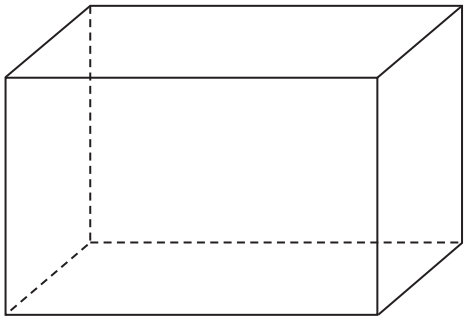
Answer ..... degrees *(5 marks)*

13

Turn over ▶

Do not write outside the box

20 The total length of the 12 edges of a cuboid is 52 cm.
The length, width and height are all different.



Work out possible dimensions of the cuboid.

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Length = ... cm

Width = ... cm

Height = ... cm *(3 marks)*

END OF QUESTIONS

3

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