Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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	
TOTAL	

General Certificate of Secondary Education
Foundation Tier
June 2012

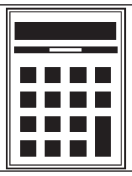
Mathematics 43603F

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.

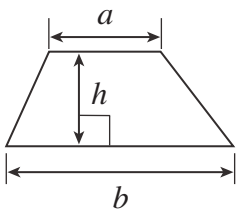
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- The quality of your written communication is specifically assessed in Questions 8 and 11. These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing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

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

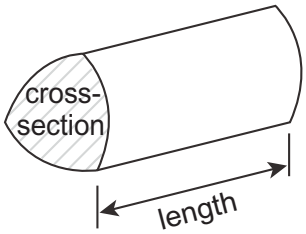
Formulae Sheet: Foundation Tier

You may need to use the following formulae:

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

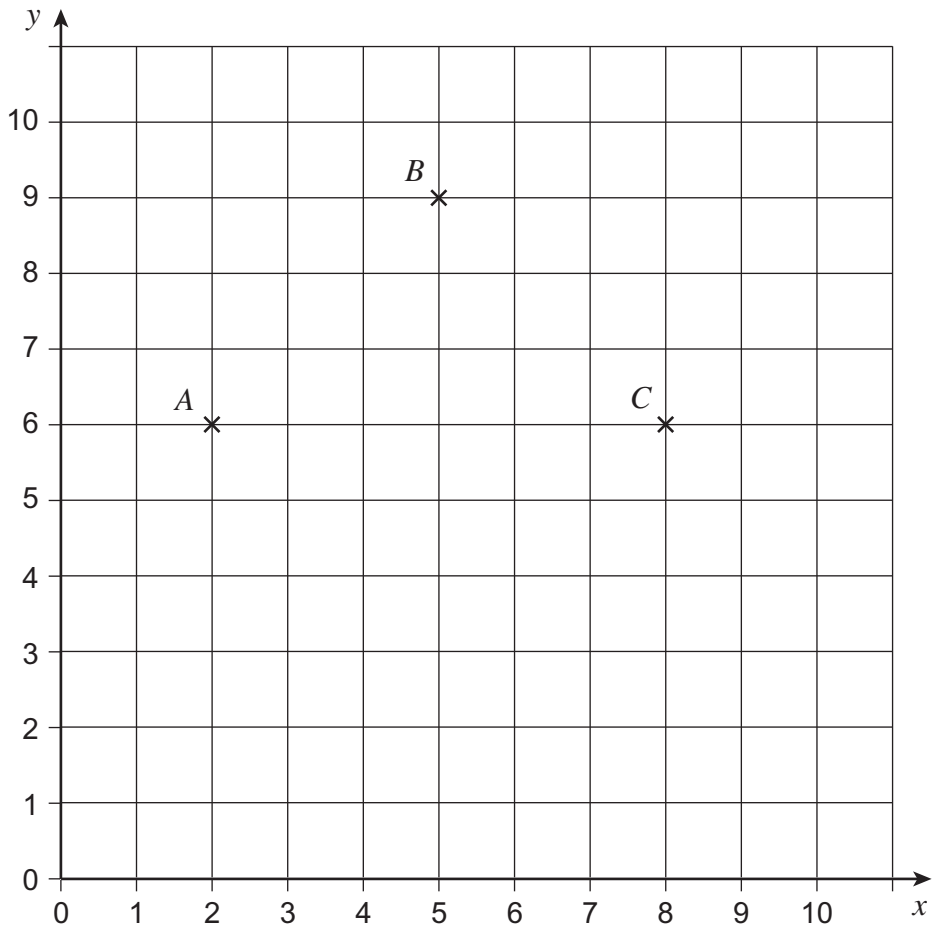


Volume of prism = area of cross-section $\times$ length



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)*

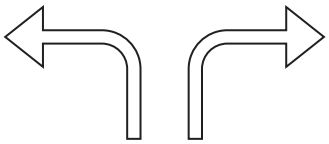
1 (b) Plot the point D so that $ABCD$ is a square.

(1 mark)

2

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

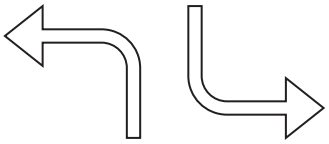
2 (a)



Reflection Rotation Translation

(1 mark)

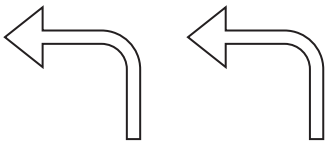
2 (b)



Reflection Rotation Translation

(1 mark)

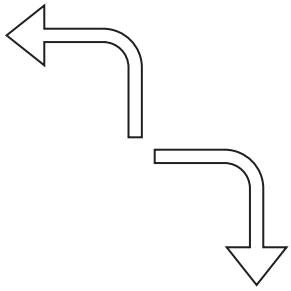
2 (c)



Reflection Rotation Translation

(1 mark)

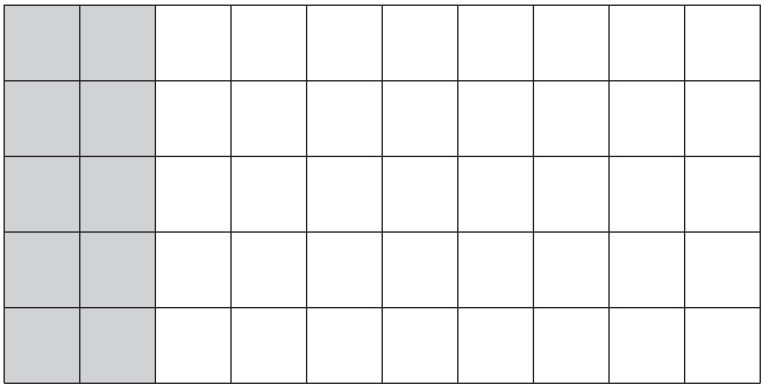
2 (d)



Reflection Rotation Translation

(1 mark)

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

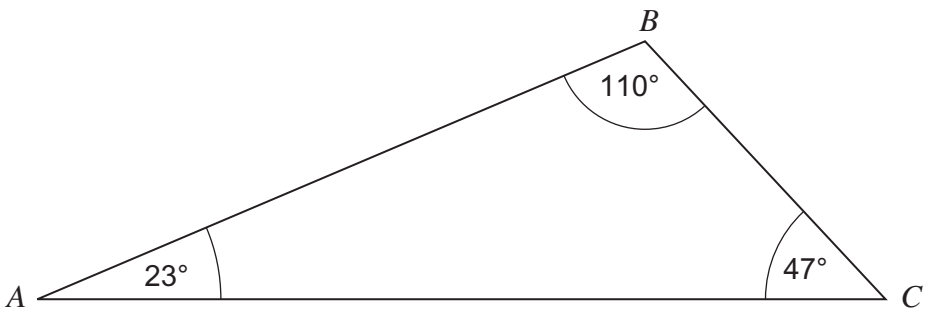
4 (a) Measure the length of line AB.

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

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

(1 mark)

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

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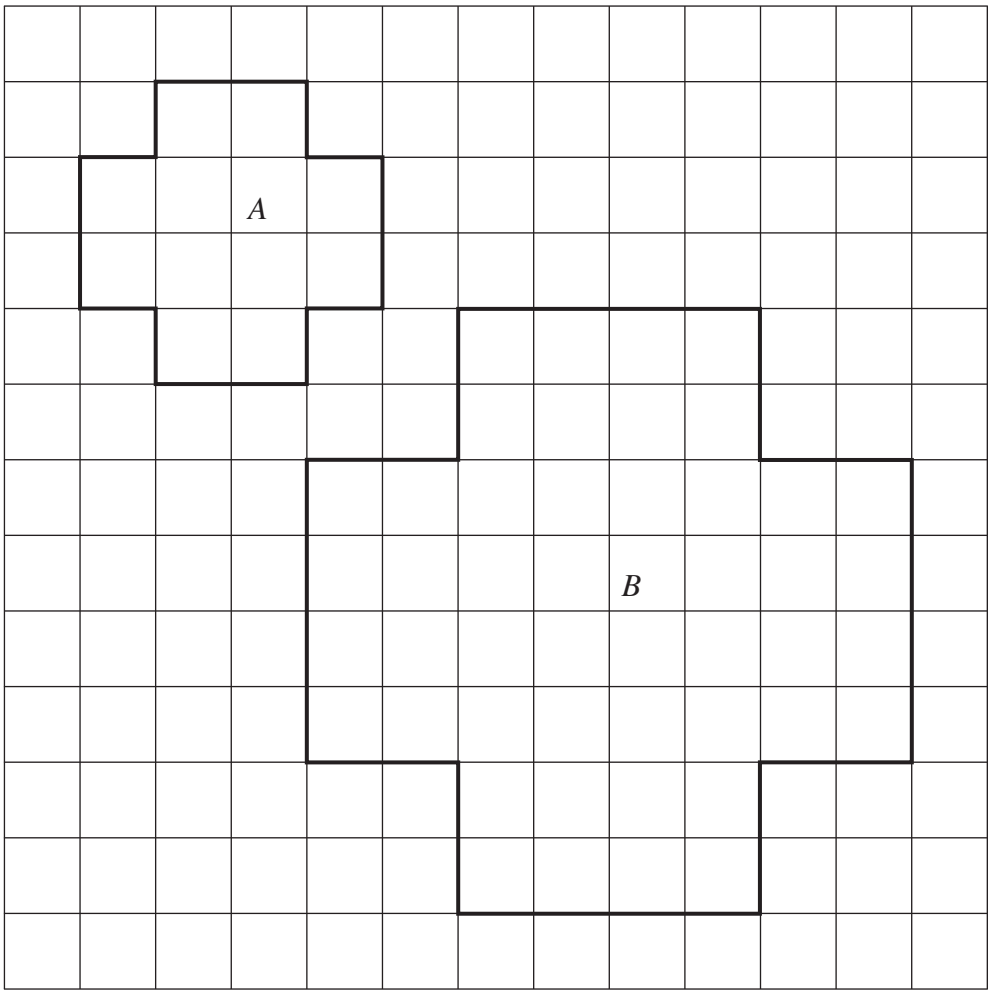
Answer ..... *(3 marks)*

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)*

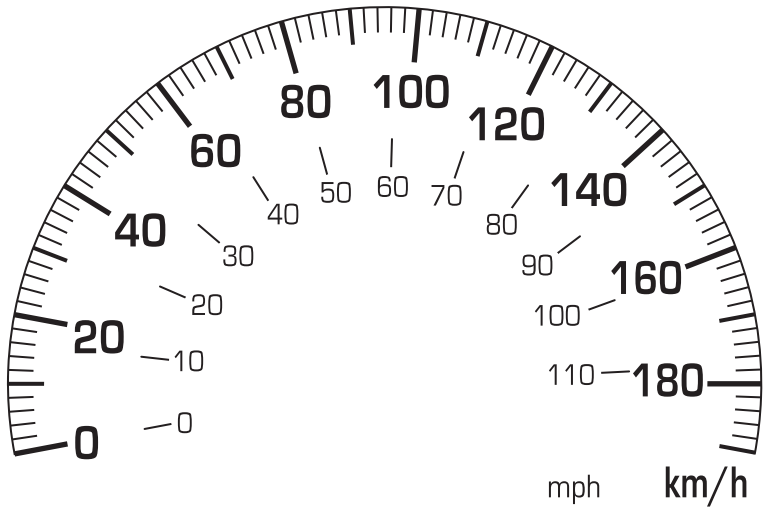
7 (b) Shape B is an enlargement of shape A.

Write down the scale factor of the enlargement.

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

8

***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)*

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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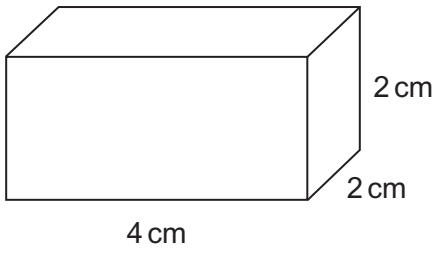
(3 marks)

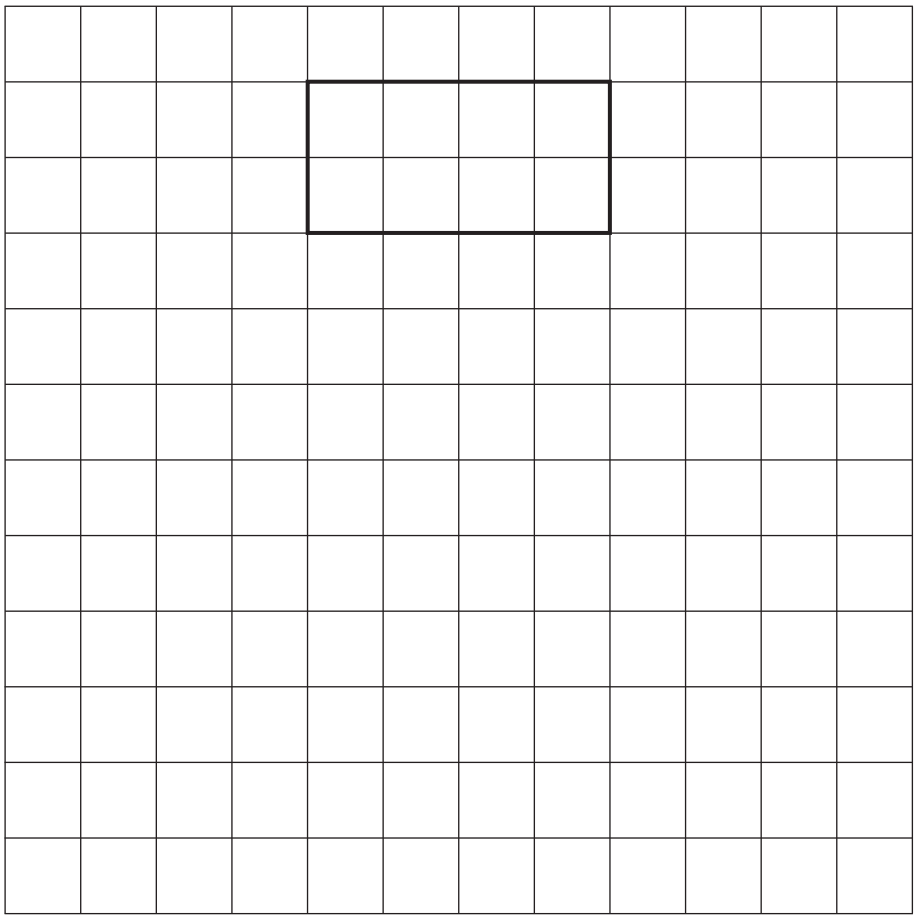
Turn over for the next question

5

9 The diagram shows a cuboid.

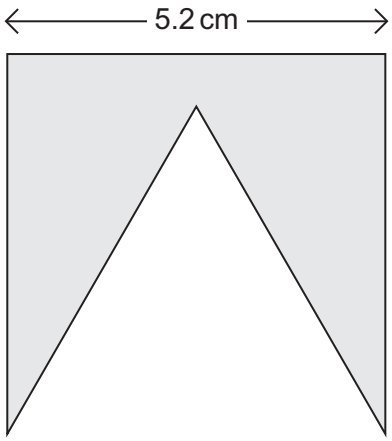


On the centimetre grid, complete a possible net for the cuboid.
One face has been drawn for you.



(3 marks)

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)*

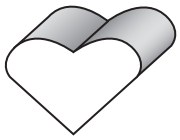
Turn over for the next question

5

***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)*

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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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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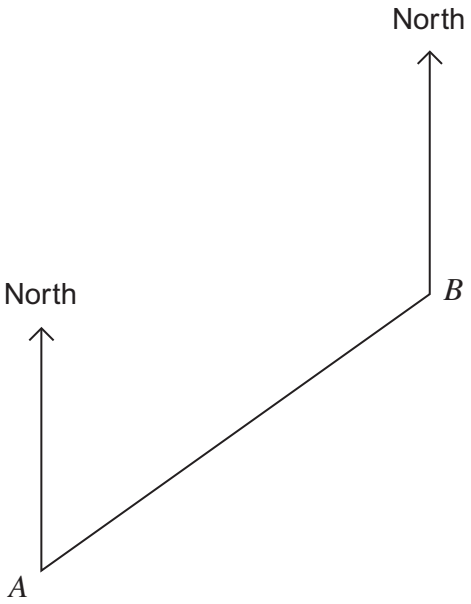
(3 marks)

11

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°.

.....

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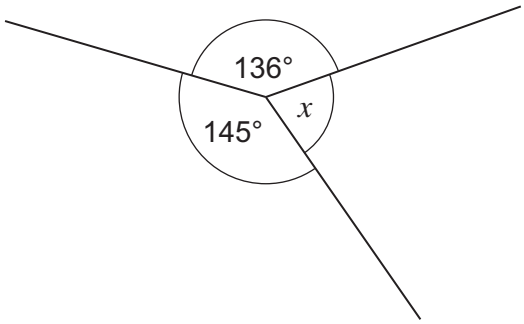
(1 mark)

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



Not drawn accurately

Work out the value of x.

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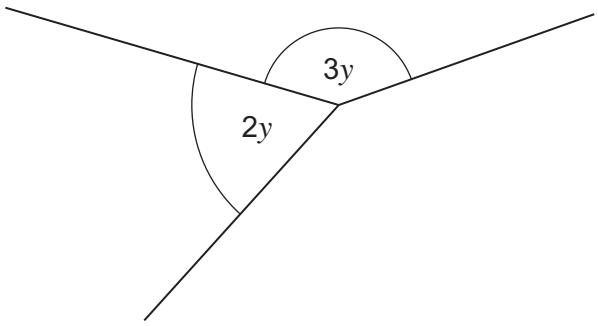
Answer ..... degrees *(2 marks)*

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



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

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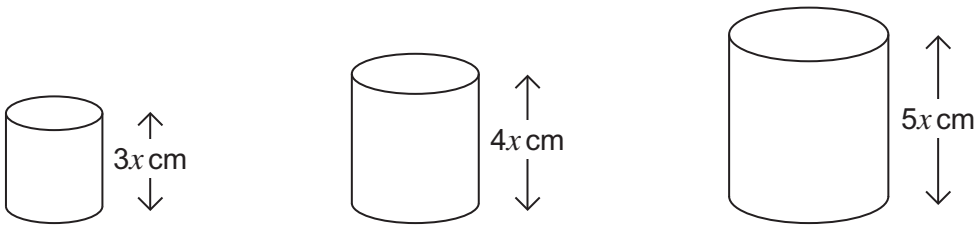
Answer ..... degrees *(2 marks)*

8

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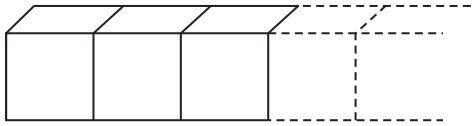
Answer ..... cm *(4 marks)*

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)*

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

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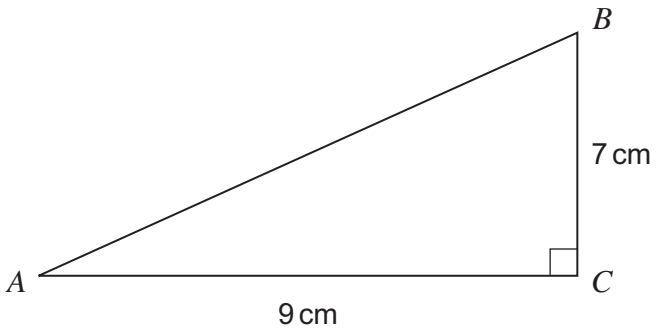
Answer ..... m^2 *(2 marks)*

17 Work out length AB as a decimal.



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

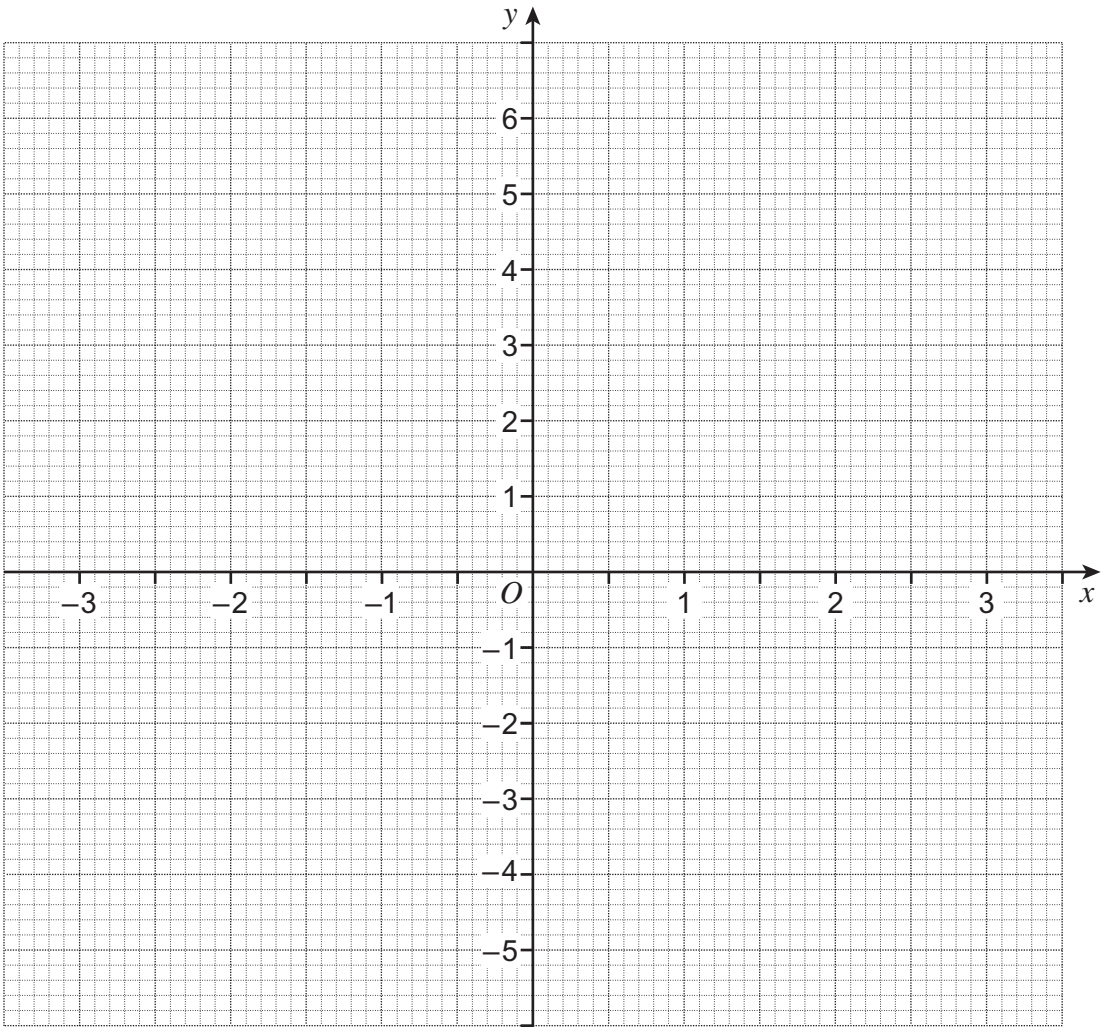
12

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)

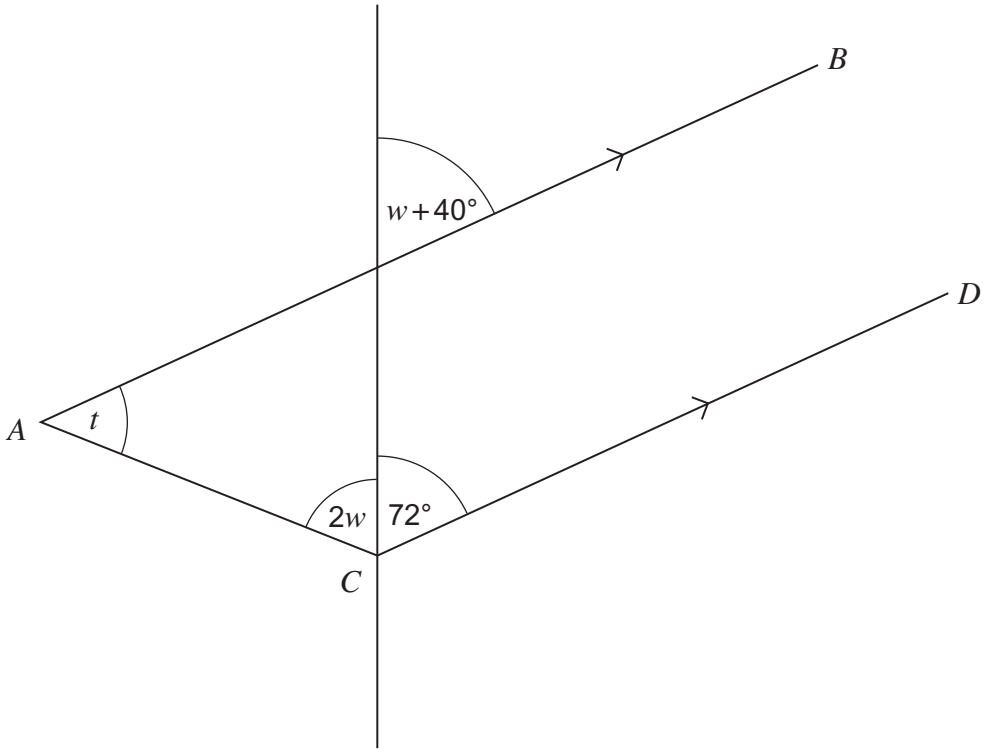
18 (c) Draw the graph of $y = 2$ on the grid opposite for values of x from –3 to 3.

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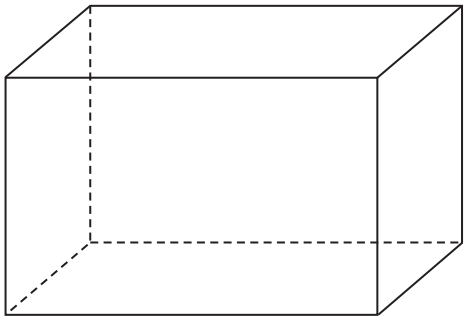
Answer ..... degrees *(5 marks)*

13

Turn over ▶

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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