Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4 – 5	
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12 – 13	
14 – 15	
16 – 17	
18 – 19	
20 – 21	
22 – 23	
TOTAL	

General Certificate of Secondary Education
Foundation Tier
March 2013

Mathematics 43603F

Unit 3

Wednesday 6 March 2013 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.

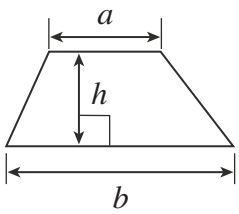
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- The quality of your written communication is specifically assessed in Questions 8 and 15. These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

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

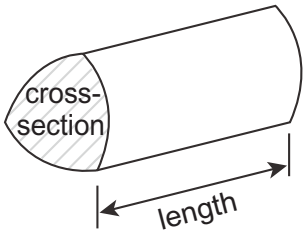
Formulae Sheet: Foundation Tier

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



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

1 Circle the smaller measurement in each pair.

1 (a) 5 centimetres 40 millimetres

(1 mark)

1 (b) 5 grams 40 kilograms

(1 mark)

1 (c) 5 litres 40 centilitres

(1 mark)

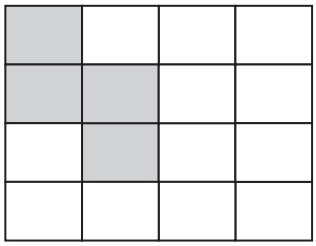
Turn over for the next question

3

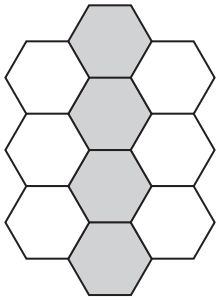
Turn over ▶

2 (a) Which **two** grids have one-quarter shaded?

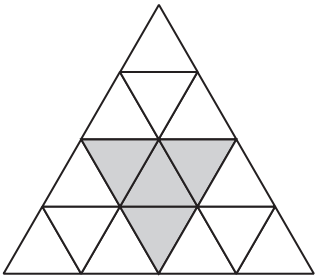
A



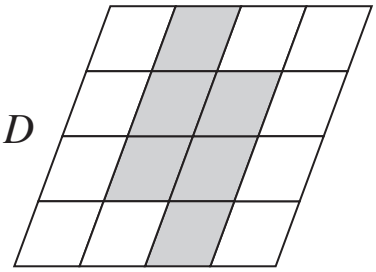
B



C

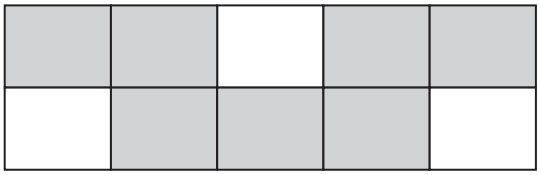


D



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

2 (b) What percentage of this grid is shaded?



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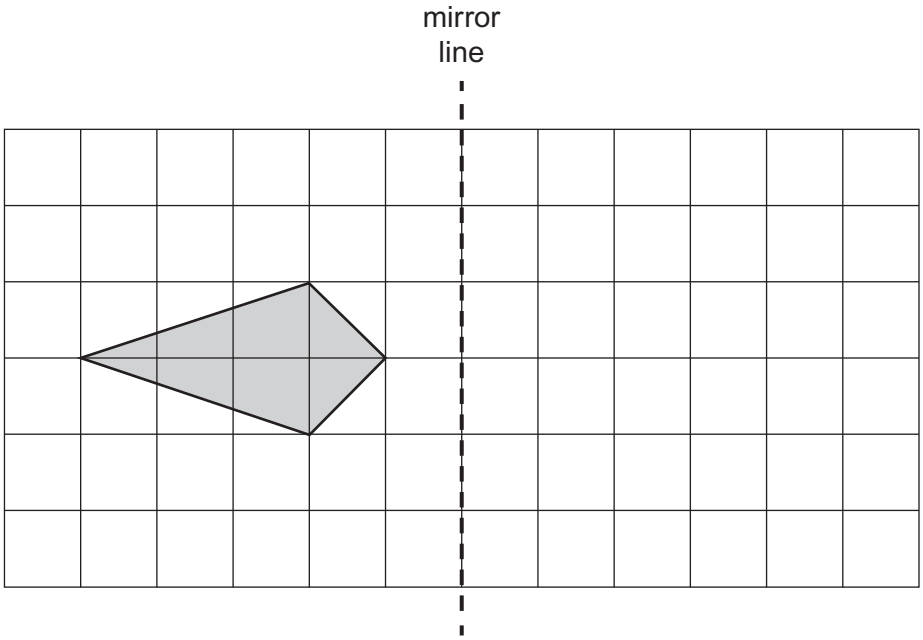
Answer ..... % *(2 marks)*

3 Reflect the shape in the mirror line.



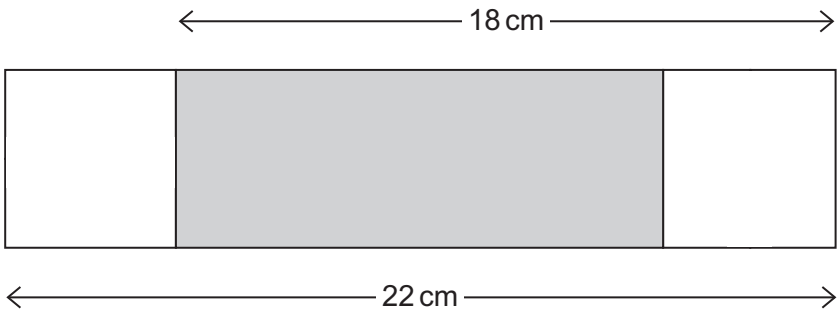
(2 marks)

Turn over for the next question

6

4 This shape is made from a shaded rectangle and two squares.

Not drawn accurately



Work out the width and length of the shaded rectangle.

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..... cm and ..... cm *(3 marks)*

5 These steps can be used to work out the area of a circle.

Step 1 Square the radius

Step 2 Multiply by 3.14

5 (a) Use these steps to work out the area of a circle, radius 5 cm.

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.....

.....

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

5 (b) The area of a circle is known.

Write down the steps to work out the radius.

Step 1 .....

Step 2 .....

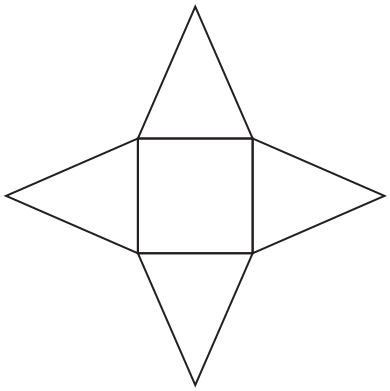
(2 marks)

Turn over for the next question

7

6 Write down the mathematical name of the shape made by each net.

.....



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(3 marks)

7 Consecutive numbers in this pattern can be used to change miles to kilometres.

3 5 8 13 21 34

For example 3 miles = 5 kilometres

5 miles = 8 kilometres and so on.

7 (a) Use the pattern to change 13 miles to kilometres.

13 miles = ... km *(1 mark)*

7 (b) Use the pattern to change 13 kilometres to miles.

13 km = ... miles *(1 mark)*

7 (c) Use the pattern to change 42 miles to kilometres.

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42 miles = ... km *(2 marks)*

7 (d) Use **two** values in the pattern to change 18 miles to kilometres.

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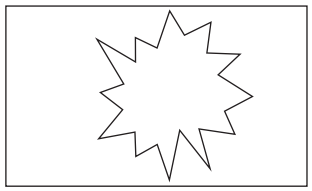
18 miles = ... km *(2 marks)*

9

8 (a) The diagram shows a piece of broken glass in a rectangular window frame.

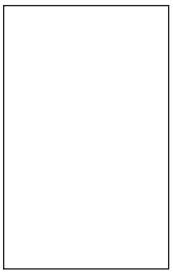


Not drawn accurately

Can these pieces of glass be cut to replace the glass in the window frame?

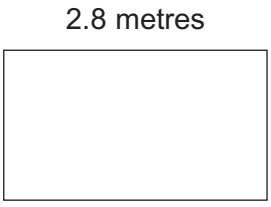
Circle Yes or No for each piece.

Not drawn accurately

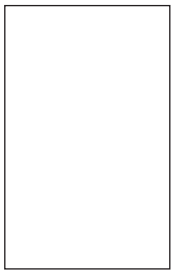


Yes No

Yes No



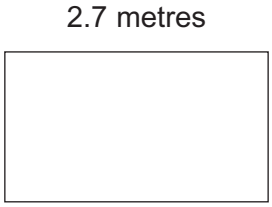
Yes No



Yes No

(3 marks)

***8 (b)** Glass costs £36.30 per square metre.



Not drawn accurately

Work out the cost of this piece of glass.

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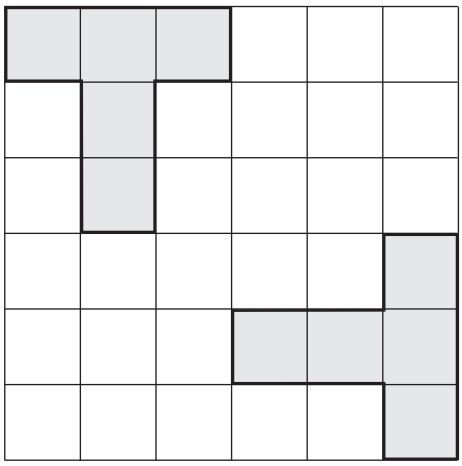
Answer £ ..... *(3 marks)*

Turn over for the next question

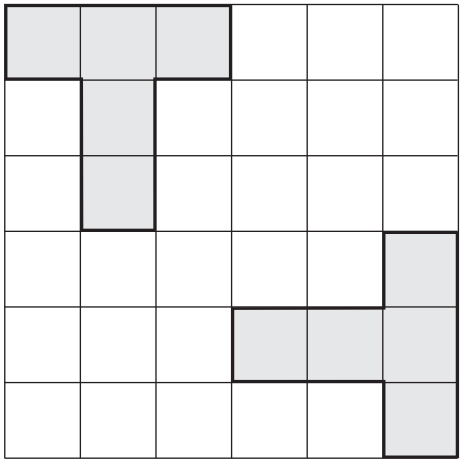
6

9 (a) The diagram shows two identical T-shapes on a grid.



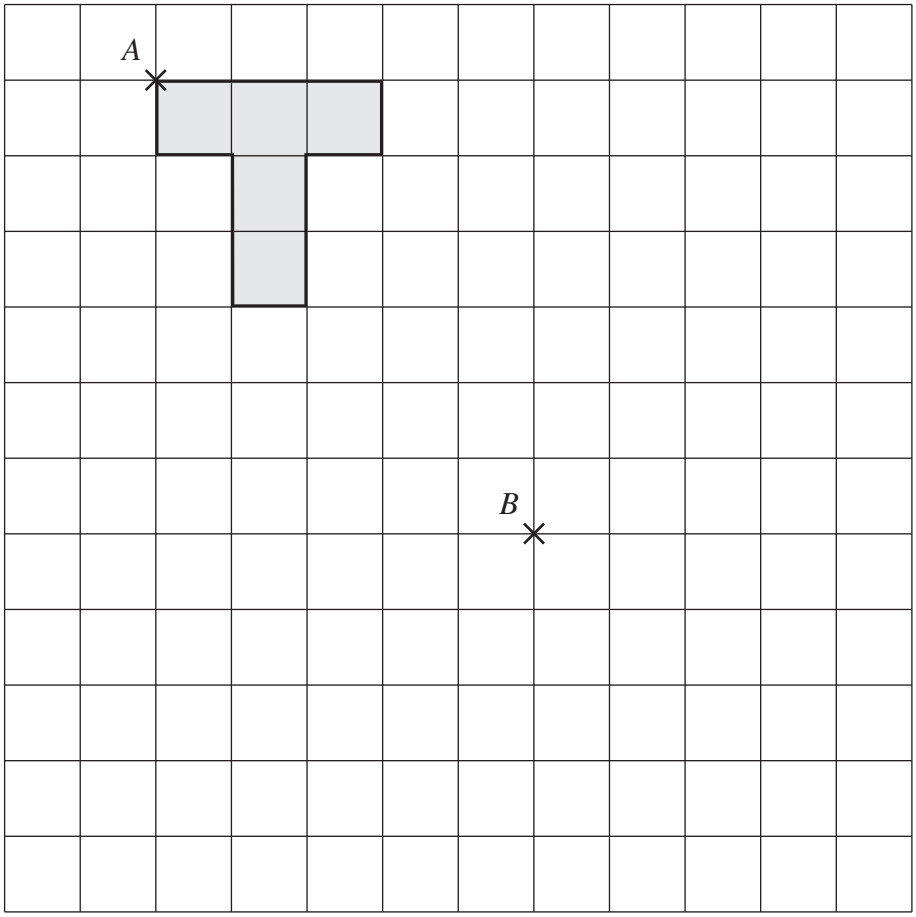
Draw **three more** of these T-shapes on the grid below without overlapping.

Answer



(2 marks)

9 (b) Translate this T-shape so that point A moves to point B.



(1 mark)

9 (c) Describe the translation.

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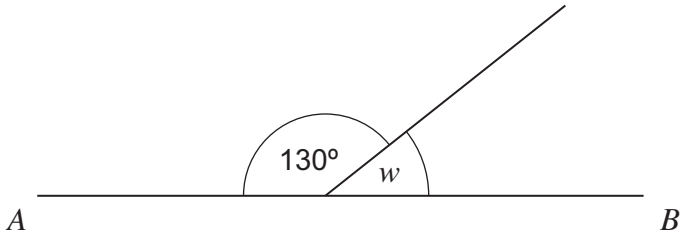
(2 marks)

5

10 (a) AB is a straight line.

Not drawn accurately



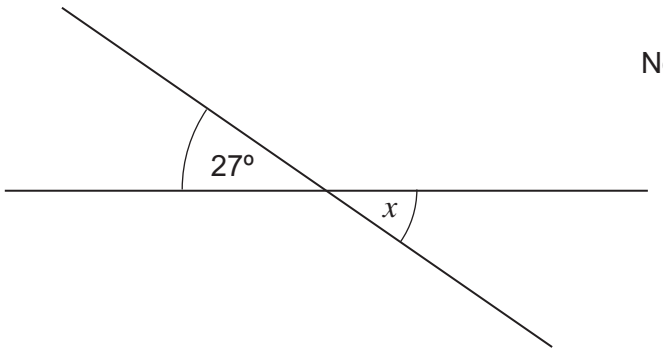
Work out the value of w.

.....

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

10 (b) The diagram shows two straight lines.

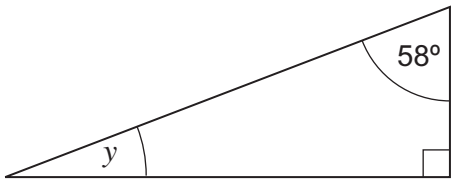
Not drawn accurately



Write down the value of x.

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

10 (c) The diagram shows a right-angled triangle.



Not drawn accurately

Work out the value of y.

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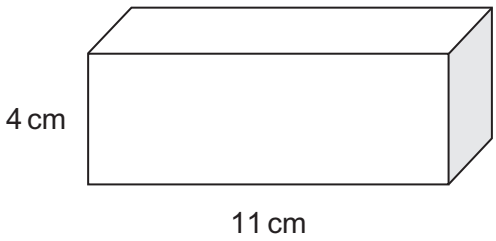
Answer ..... degrees *(2 marks)*

11 The diagram shows a cuboid.
The cross-section (shaded) is a square.



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

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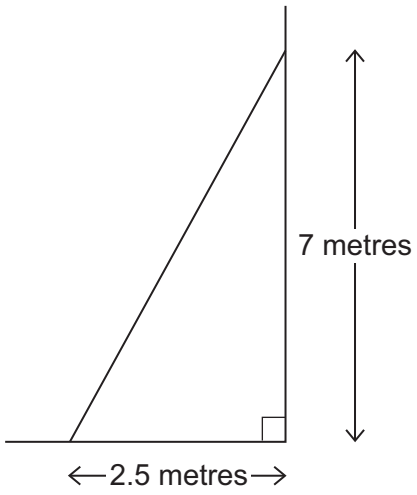
Answer ..... *(3 marks)*

7

12 (a) The diagram shows a sketch of a ladder on horizontal ground against a vertical wall.



Not drawn accurately

Make an accurate scale drawing.
The horizontal ground has been drawn for you.
Use a scale of 1 cm to represent 1 metre.

(2 marks)

12 (b) Use your drawing to work out the actual length of the ladder.

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

13 (a) One litre of fuel weighs 737 grams.

How much does 70 litres of fuel weigh?
Give your answer in kilograms.

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

13 (b) Fuel flows through a pump at 30 litres per minute.

How long does it take to put 70 litres in a tank?
Give your answer in minutes and seconds.

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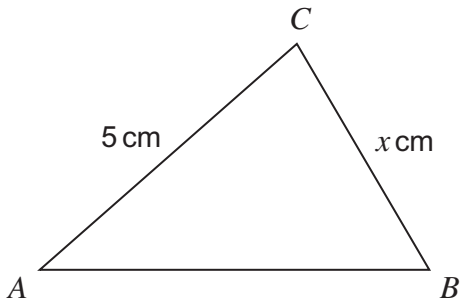
Answer ..... minutes ..... seconds *(3 marks)*

Turn over for the next question

9

14 In the triangle, AB is 3 cm longer than BC.



Not drawn accurately

14 (a) Write down an expression for the length of AB.

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

14 (b) The triangle is isosceles.

Write down the **two** possible values of x.

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

***15** Here are two bottles of the same perfume.

Normal price £40

20% off

£55

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

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(6 marks)

9

Turn over ▶

16 (a) The scale on a map is 1 : 20 000

What is the actual distance represented by 1 centimetre?
Give your answer in metres.

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

16 (b) The scale on a different map is 1 inch represents 4 miles.
A road on the map measures 6 inches to the nearest inch.

What is the shortest possible distance of the road?

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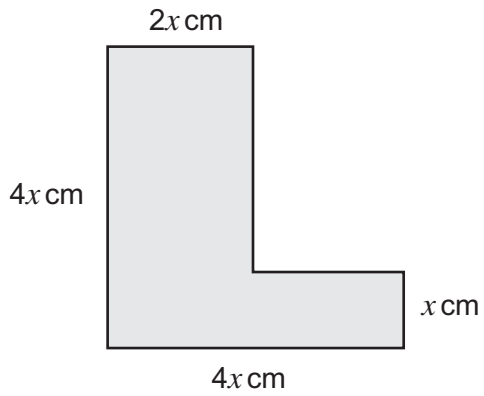
Answer ..... miles *(3 marks)*

17 The perimeter of this L-shape is 56 cm.

Not drawn accurately



Set up and solve an equation to work out the value of x.

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x = ... *(4 marks)*

18 Work out the circumference of a circle, radius 4.2 cm.
Give your answer to 1 decimal place.

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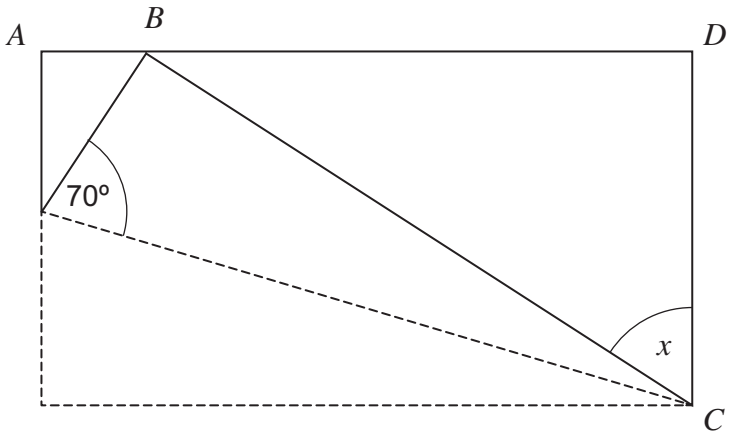
Answer ..... cm *(3 marks)*

12

19 The diagram shows a rectangular sheet of paper $ABCD$.

Not drawn accurately

Corner B is folded to meet side AD as shown below.



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Work out the angle marked x on the diagram.

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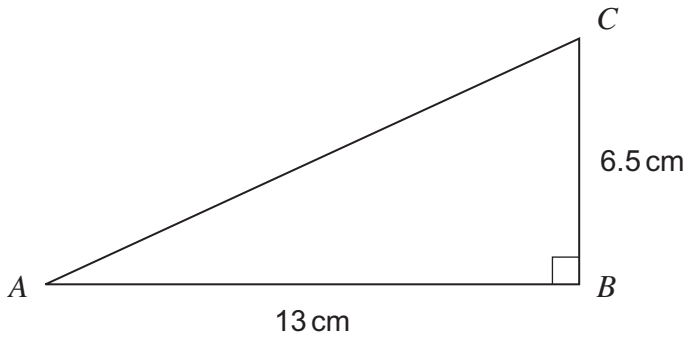
Answer ..... degrees *(4 marks)*

20 Work out the length AC.



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

END OF QUESTIONS

7

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED