Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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

General Certificate of Secondary Education
Foundation Tier
November 2012

Mathematics 43603F

Unit 3

Monday 12 November 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.

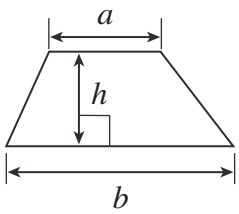
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- The quality of your written communication is specifically assessed in Questions 1, 7 and 13. These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

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

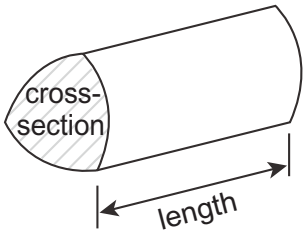
Formulae Sheet: Foundation Tier

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 are the readings from a water meter.

Meter reading	November 2012	3587 m^3
Meter reading	August 2012	3563 m^3

1 (a) Do a subtraction to work out the volume of water used.

.....

Answer ..... m^3 *(1 mark)*

1 (b) Water costs £1.20 for each cubic metre (m^3).

Work out the cost of water used.

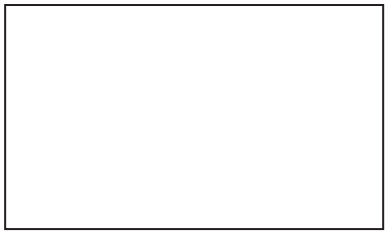
.....

Answer £ ..... *(2 marks)*

Turn over for the next question

3

2 The rectangle is drawn accurately.



Work out the perimeter of the rectangle.

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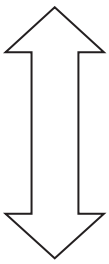
.....

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

3 For each shape write down the number of lines of symmetry and the order of rotational symmetry.

	Number of lines of symmetry	**Order of rotational symmetry**
	.....	.....
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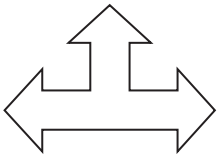
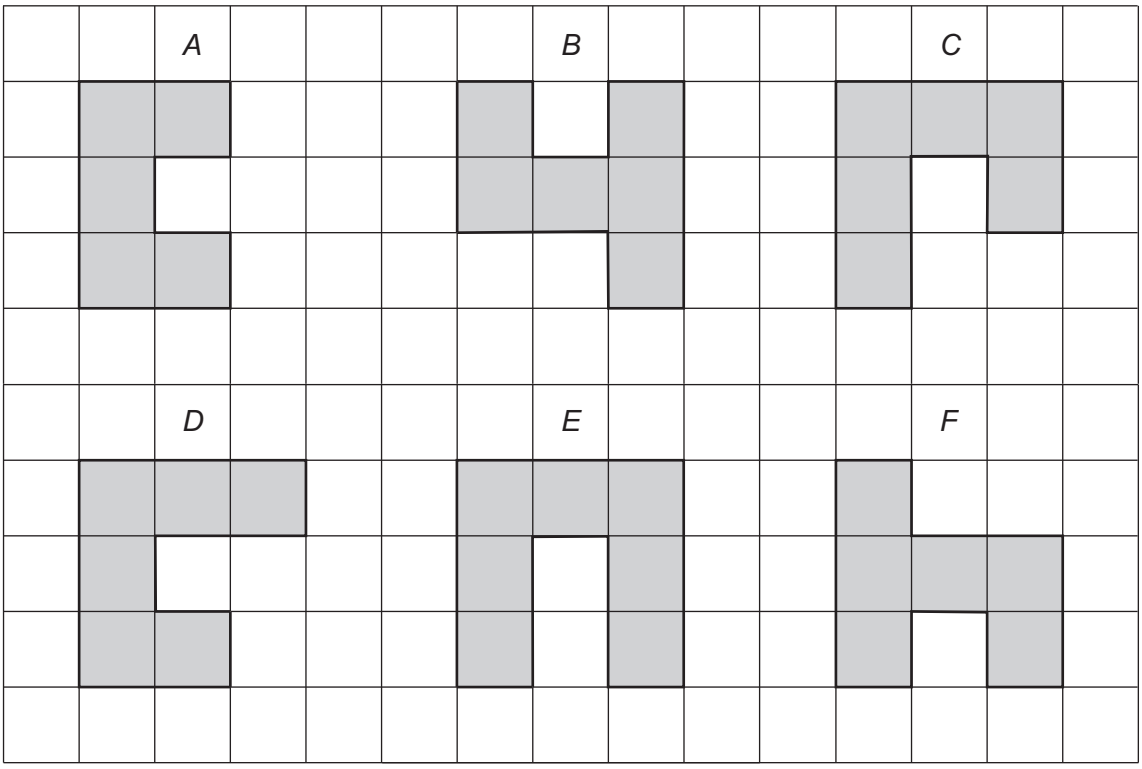
	.....	.....

(4 marks)

Turn over for the next question

7

4 Here are six shapes.



4 (a) Which shape is congruent to shape *B*?

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

4 (b) Name **two** other congruent shapes.

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

5 The timetable shows flight times from Manchester to Rome.

✈ shows a flight on that day.

Depart Manchester	Arrive Rome	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
06:50	10:50	✈		✈		✈	✈	✈
13:10	17:10		✈					
14:00	18:00				✈			

5 (a) On which day does the flight arrive in Rome at 5.10 pm?

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

5 (b) The times on the timetable are local times.
When it is 9 o'clock in Manchester, it is 10 o'clock in Rome.

How long is each flight?

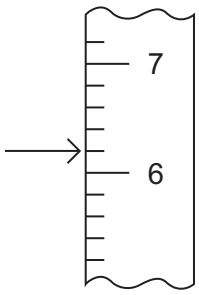
.....

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

Turn over for the next question

5

6 (a) Robin says that the arrow is pointing to 6.1



He is **not** correct.

What is his mistake?

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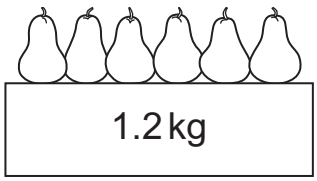
(1 mark)

6 (b) Six pears of equal size are weighed on a digital scale.



Estimate the weight of one pear.
Give your answer in grams.

.....

.....

.....

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

*7 The work in an office takes 200 hours to complete every week.
Each person in the office works 35 hours a week.

7 (a) What is the smallest number of people needed to complete the work?

.....

.....

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

7 (b) The number of hours each person works is increased to 40 hours a week.

Does the office still need the same number of people?
You **must** show your working.

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(2 marks)

8 (a) A man is facing North.
He turns 90º clockwise.

Which way is he facing now?

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

8 (b) A woman is facing South.
She turns clockwise to face West.

What fraction of a turn has she completed?
Give your answer in its simplest form.

.....

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

12

9 A builder uses this method to work out the cost (£) of building an extension.

- Work out the floor area in square metres
- Multiply this answer by 1500

The diagram shows a rectangular floor.

Not drawn accurately

Work out the cost of building an extension on this floor.

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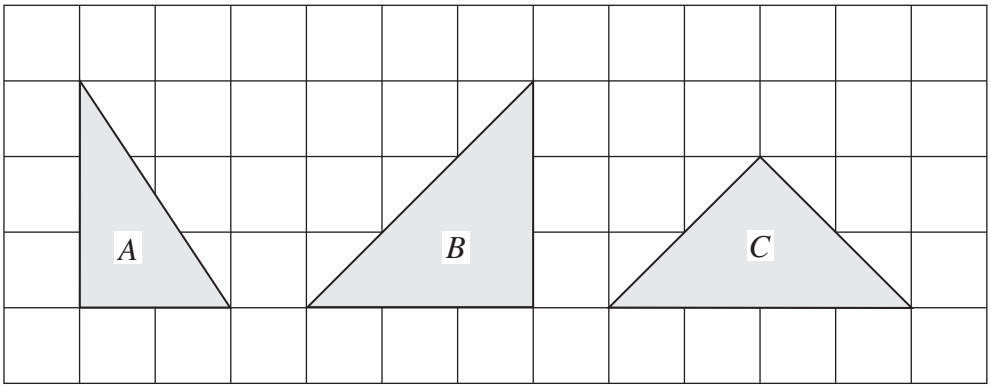
Answer £ ..... *(3 marks)*

10 Three triangles are shown on the centimetre grid.



10 (a) Which triangle is **not** isosceles?

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

10 (b) Work out the area of the triangle with the greatest area.
State the units of your answer.

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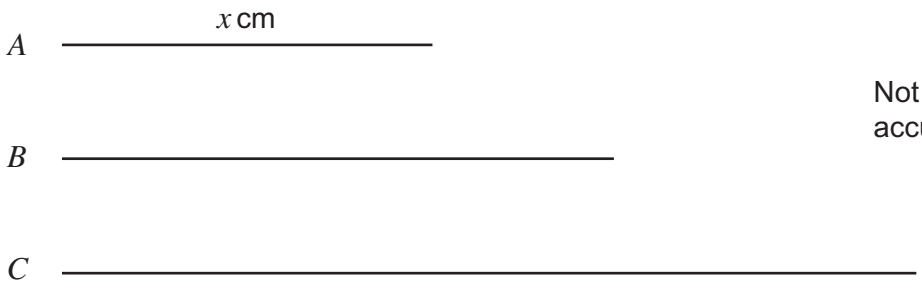
Answer ..... *(3 marks)*

7

Turn over ▶

11 The diagram shows three rods A, B and C.



Not drawn accurately

The length of A is x cm.
The length of B is 3 cm more than the length of A.
The length of C is twice the length of A.

11 (a) Write down an expression for the length of B.

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

11 (b) Write down an expression for the length of C.

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

11 (c) The length of C is 4 cm more than the length of B.

Work out the value of x.

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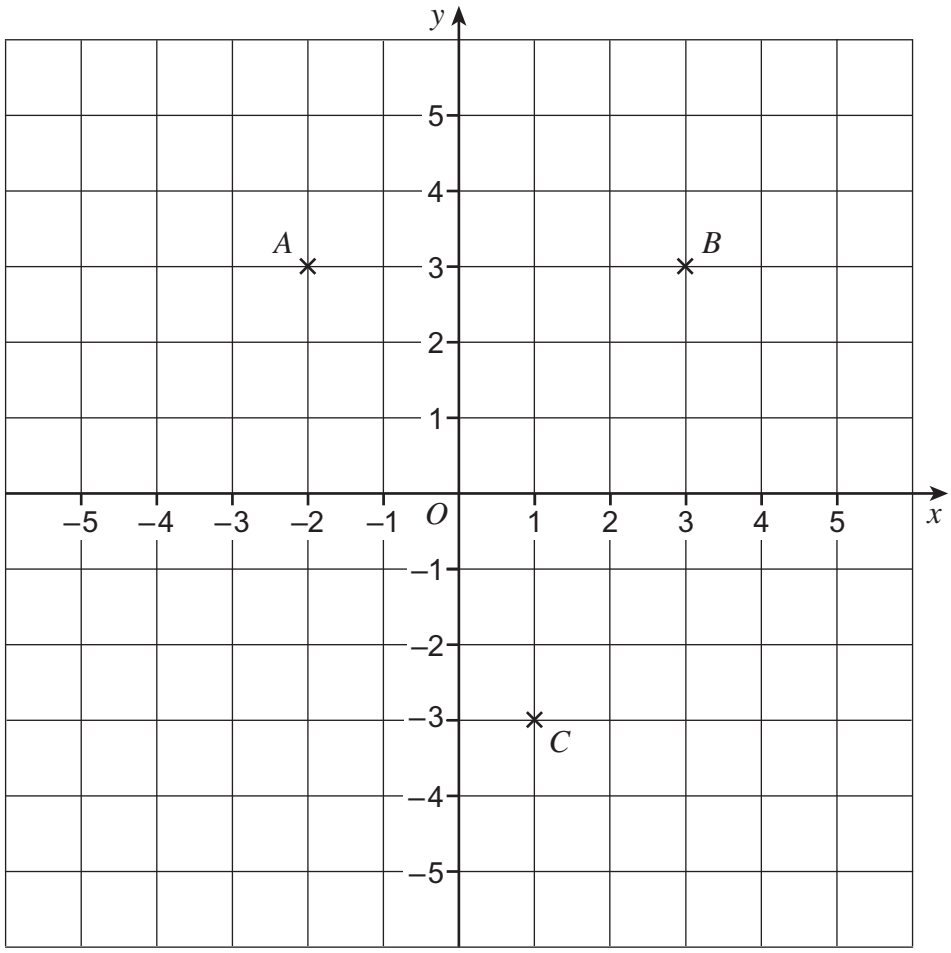
Answer ..... cm *(3 marks)*

12 Points A, B and C are shown on the centimetre grid.



12 (a) Write down the coordinates of A.

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

12 (b) Plot a point D so that $ABCD$ is a parallelogram.

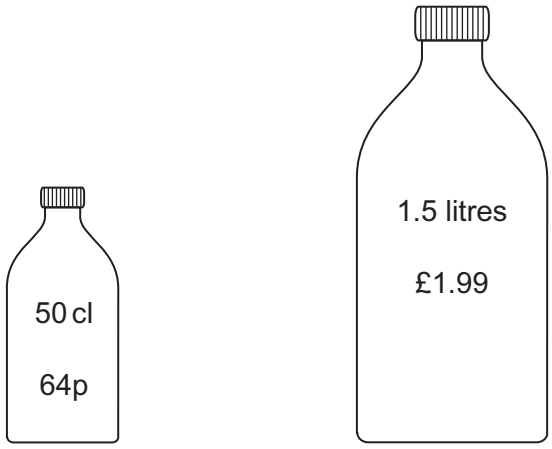
(1 mark)

12 (c) Write down the coordinates of D.

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

8

***13** The diagram shows two bottles of the same drink.



You are given that 1 litre = 100 cl

13 (a) Work out the cost per litre for the small bottle.

.....

Answer £ ..... *(2 marks)*

13 (b) Which bottle is better value for money?
You **must** show your working.

.....

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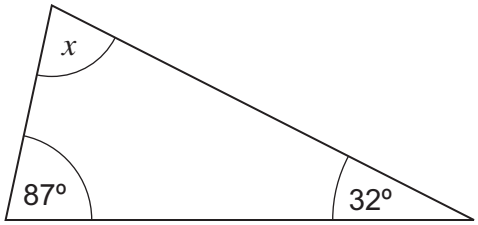
Answer ..... *(3 marks)*

14 Work out the value of x.



Not drawn accurately

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

15 Three angles are in the ratio 2 : 3 : 7
The smallest angle is 60°.

Show that these three angles will fit together at a point with no gaps.

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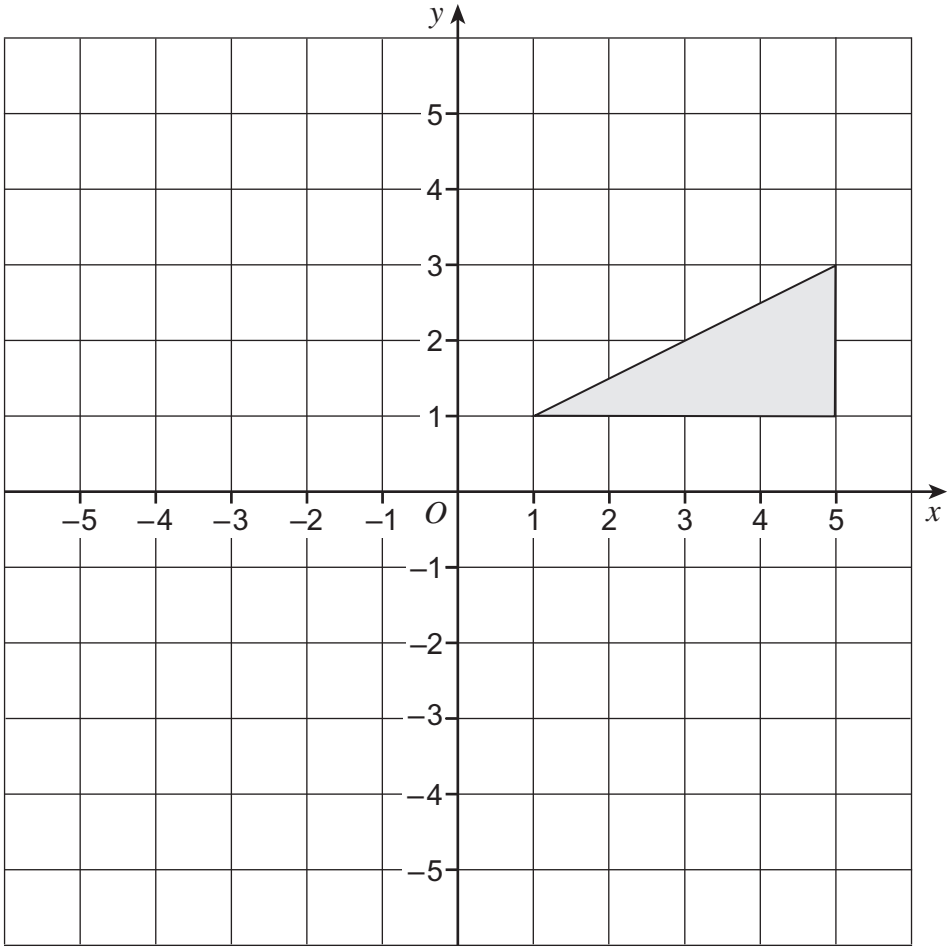
(3 marks)

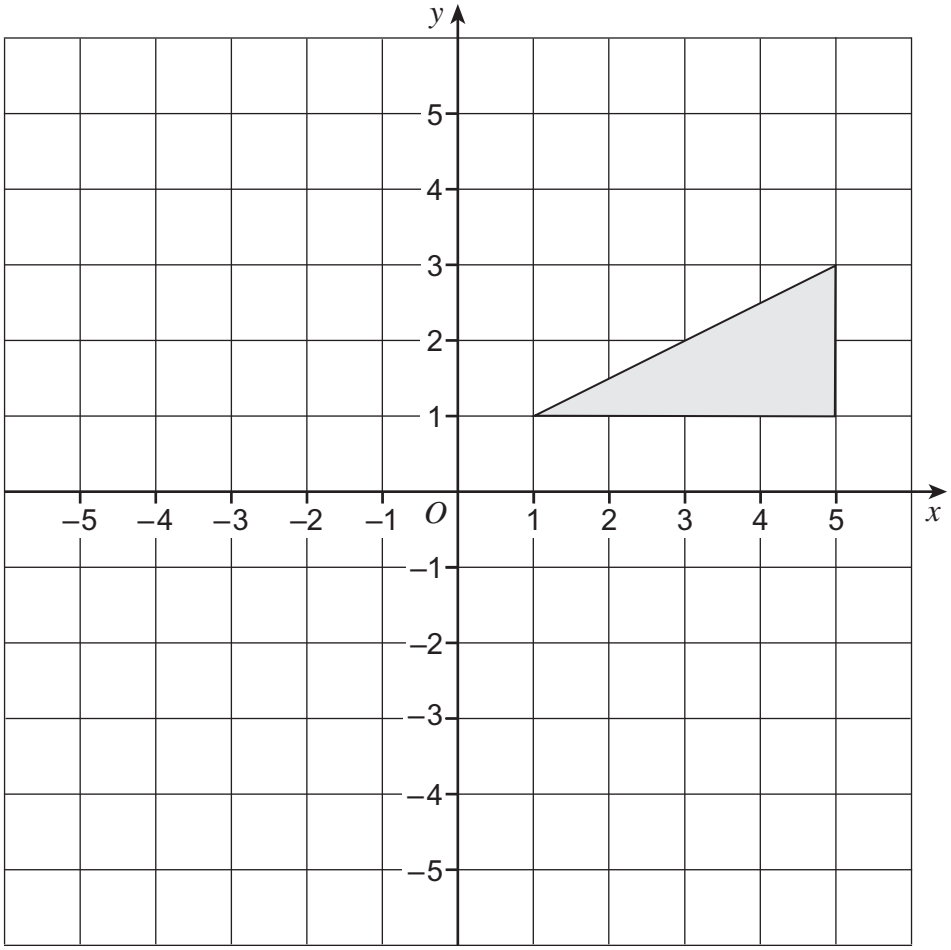
10

16 (a) Reflect the triangle in the x-axis.



(1 mark)

16 (b) Rotate the triangle through 180º about the origin.

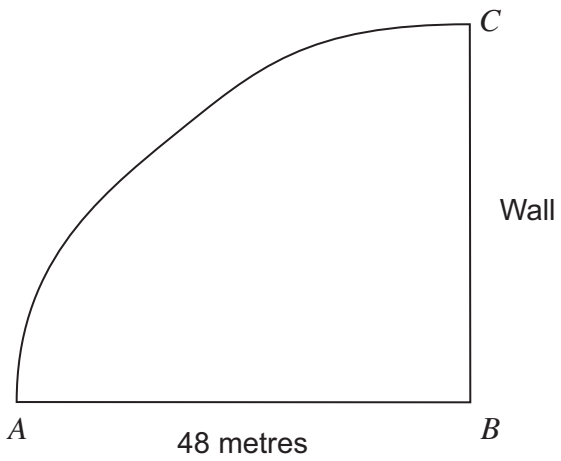


(2 marks)

Turn over for the next question

3

17 Here is a scale drawing of a park.
A to B measures 48 metres.



A wall is to be built from B to C.
250 bricks are needed for each metre of wall.

Work out the total number of bricks needed to build the wall.

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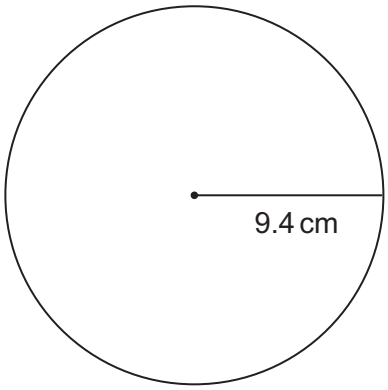
Answer ..... *(5 marks)*

18 A circle has radius 9.4 cm.



Not drawn accurately

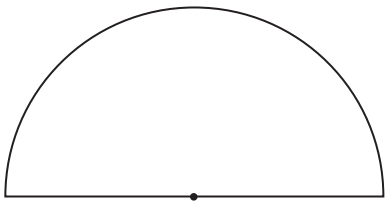
18 (a) Work out the circumference of the circle.

.....

.....

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

18 (b) A semicircle has radius 9.4 cm.



Not drawn accurately

Use your answer to part (a) to work out the perimeter of the semicircle.

.....

.....

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

9

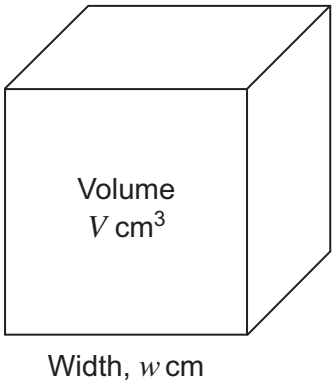
19 The diagram shows a square piece of card.

19 (a) Write down a formula connecting A and w.

.....

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

19 (b) This diagram shows a cube.



Write down a formula connecting V and w.

.....

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

19 (c) The area of one face of a cube is 20 cm^2.

Work out the volume of the cube.

.....

.....

.....

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

Turn over for the next question

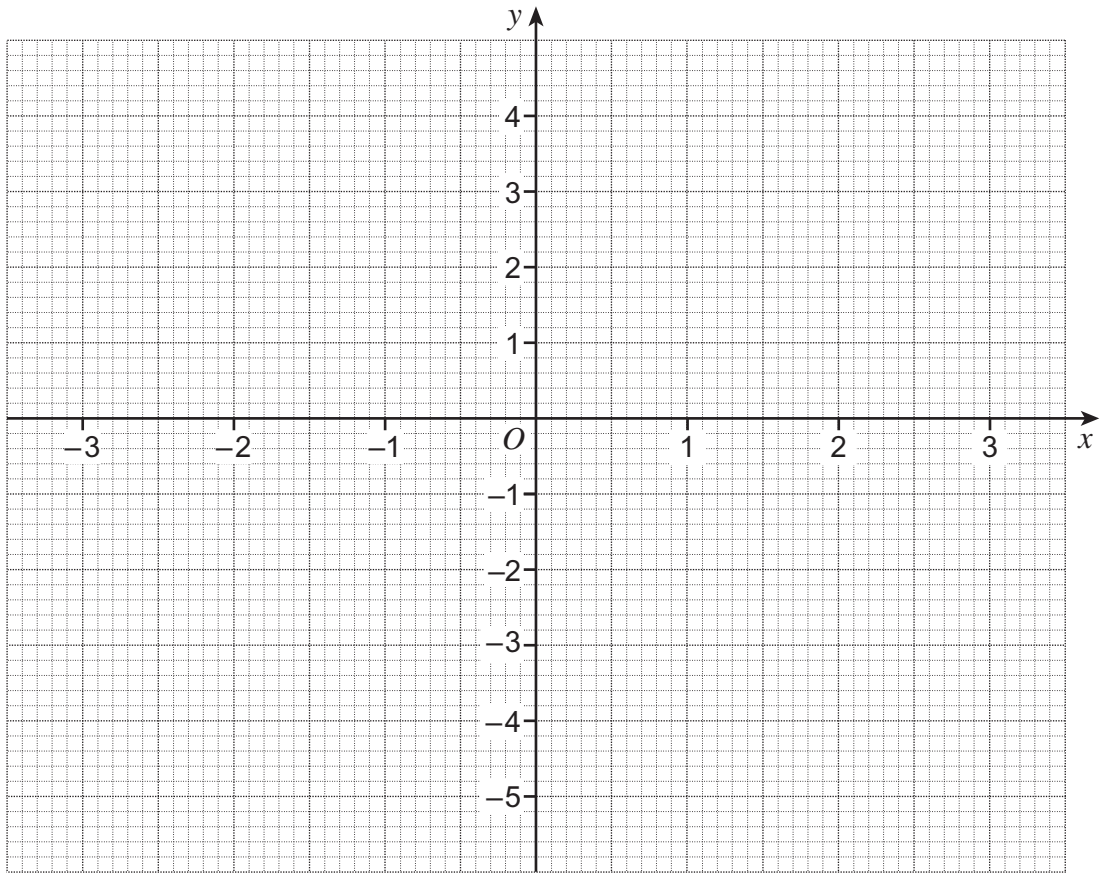
5

20 (a) Complete the table of values for $y = x^2 - 5$

x	–3	–2	–1	0	1	2	3
y		–1	–4	–5		–1	4

(2 marks)

20 (b) Draw the graph of $y = x^2 - 5$ for values of x from –3 to 3.

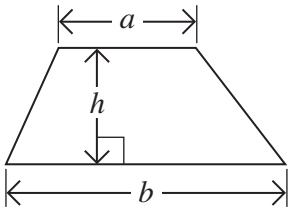


(3 marks)

20 (c) Write down the values of x when $y = 0$

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

21 In the trapezium, a = 6.5 m, b = 8.3 m and h = 3.2 m



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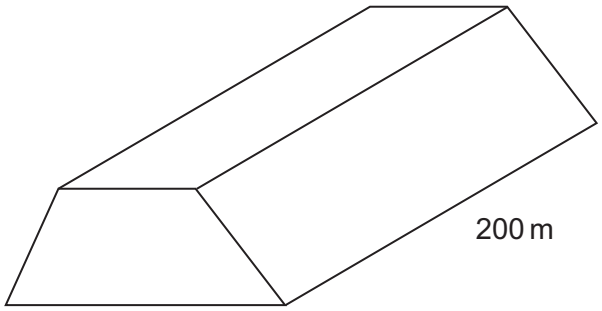
21 (a) Work out the area of the trapezium.

.....

.....

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

21 (b) The trapezium is the cross-section of a tunnel.
The tunnel is 200 metres long.



Work out the volume of the tunnel.

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Answer ..... m^3 *(2 marks)*

END OF QUESTIONS

11

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED