OCR

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Friday 7 November 2014 – Morning

GCSE MATHEMATICS B

J567/02 Paper 2 (Foundation Tier)

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

Duration: 1 hour 30 minutes

J567702

118312038 9

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

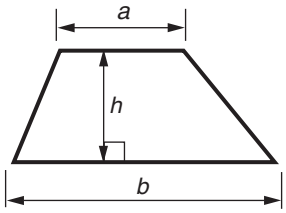
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- Your quality of written communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **100**.
- This document consists of **24** pages. Any blank pages are indicated.

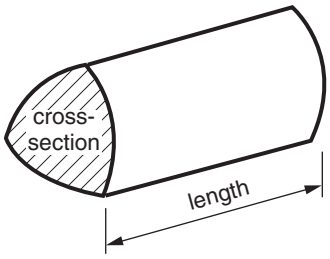
You are permitted to use a calculator for this paper

Formulae Sheet: Foundation Tier

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



Volume of prism = (area of cross-section) × length

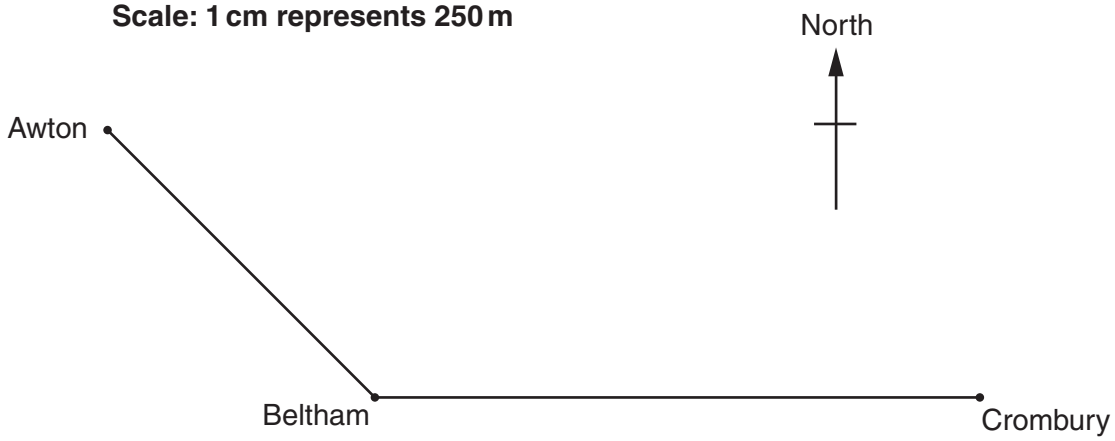


PLEASE DO NOT WRITE ON THIS PAGE

Answer **all** the questions.

1 This is a map showing three villages with two roads.

Scale: 1 cm represents 250 m



(a) Use compass directions to complete these statements.

Crombury is ..... of Beltham.

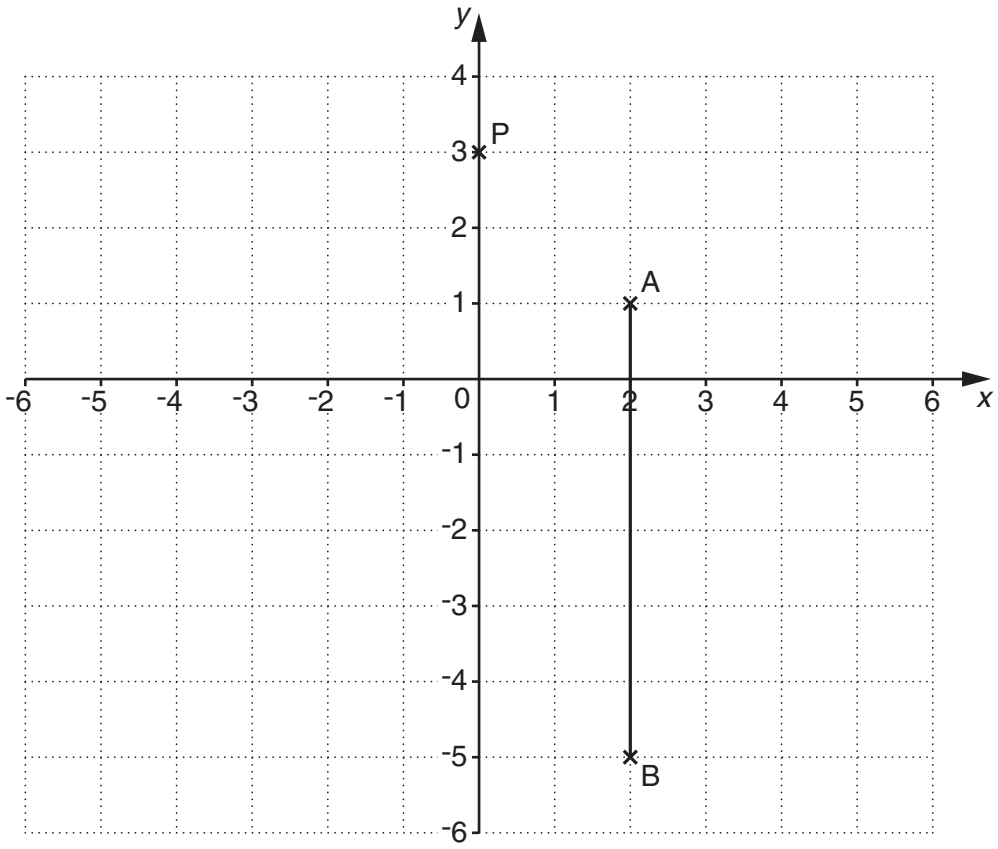
Awton is ..... of Beltham. **[2]**

(b) Complete these statements, giving your answers in kilometres.
Show how you get your answers.

The real distance between Beltham and Crombury is .....km.

The real distance between Awton and Beltham is .....km. **[4]**

2 This is a coordinate grid.



(a) **(i)** Write down the coordinates of point P.

(a)(i) (..... , ...) **[1]**

(ii) Write down the coordinates of point B.

(ii) (..... , ...) **[1]**

(b) The point C satisfies these conditions:

- both coordinates of point C are negative whole numbers
- the triangle ABC has an area of 12 cm^2
- the triangle ABC is right-angled.

Mark and label point C on the grid. **[2]**

3 **(a)** Write these temperatures in order, coldest first.

-5°C 13°C -17°C 6°C

(a) .....°C .....°C .....°C .....°C **[1]**
coldest

(b) Write these decimals in order of size, smallest first.

1.79 1.4 1.21 1.06

(b) .... **[2]**
smallest

4 Amy is making some shelves for her bedroom.

kilograms	metres	millimetres	kilometres
litres	milligrams	grams	millilitres

Complete her shopping list, using words from the box above.

Wood for shelves of length 3.5 ..... .

A tin of paint containing 1.5 ..... .

A bag of screws weighing 100 ..... . **[3]**

5 A car park charges £2.50 for each car.

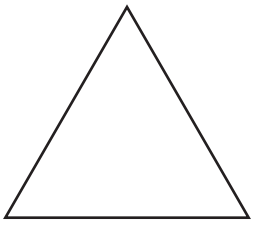
This table shows the coins the car park attendant collected from car parking on Tuesday.
He did not have any notes.

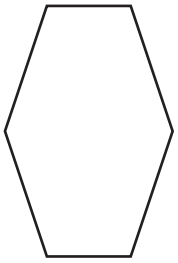
Coins	Number of Coins	
£2	40	
£1	106	
50p	88	
20p	116	
10p	168	

How many cars used the car park on Tuesday?

..... **[4]**

6 **(a)** Write down the order of rotation symmetry of each of these shapes.



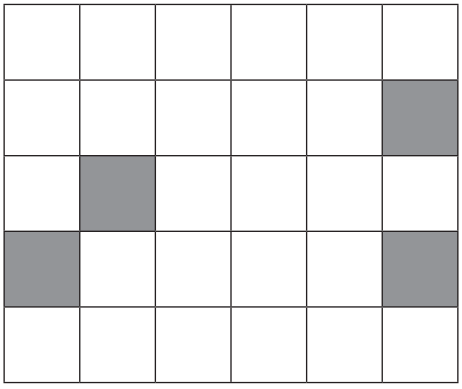


.... **[2]**

(b) Write down the order of rotation symmetry of a regular octagon.

(b) ..... **[1]**

(c) Shade **2 more** small squares on this shape so that it has 2 lines of reflection symmetry.



[2]

7 Work out the value of

(a) $\frac{m}{4} + 7$ when $m = 20$,

(a) ..... **[1]**

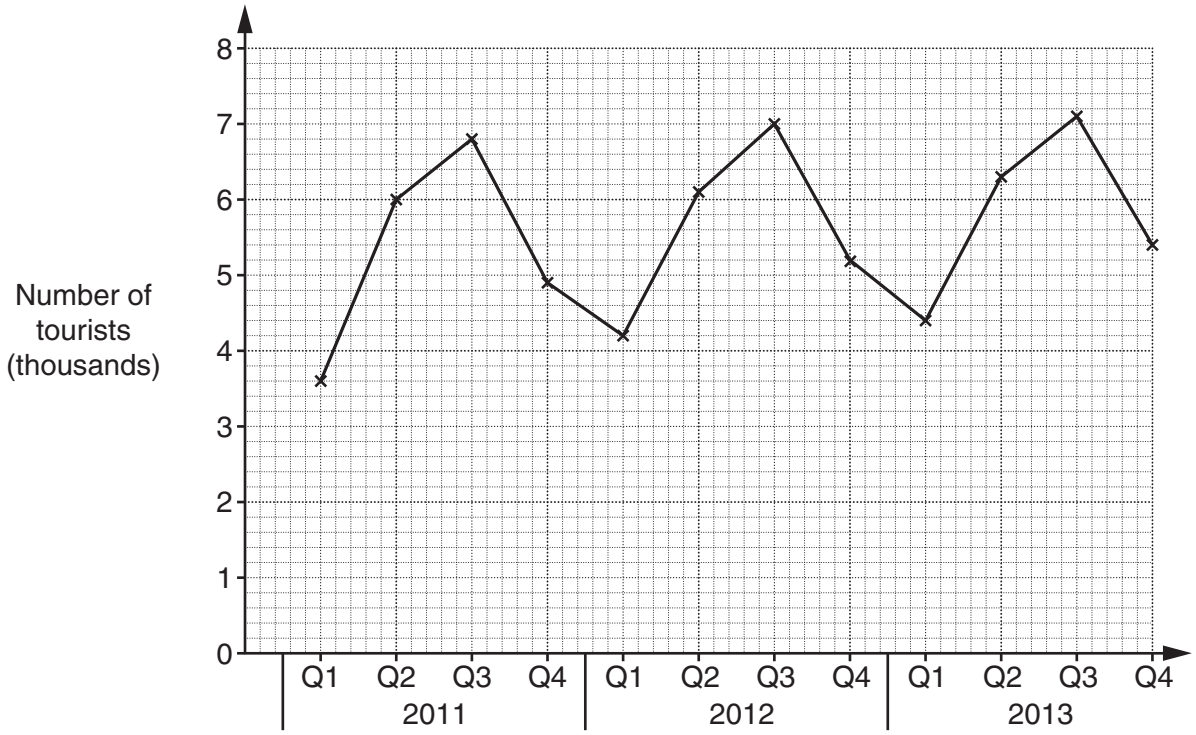
(b) $3(y + 6)$ when $y = 5$,

(b) ..... **[1]**

(c) $2p - 18$ when $p = 4$.

(c) ..... **[2]**

8 This graph shows the number of tourists visiting an island in each quarter from 2011 to 2013.



Q1 is the first quarter of the year (January, February and March).
Q2 is the second quarter of the year (April, May and June).
Q3 is the third quarter of the year (July, August and September).
Q4 is the fourth quarter of the year (October, November and December).

(a) How many tourists were there in

(i) the second quarter of 2011,

(a)(i) ..... **[1]**

(ii) the first quarter of 2013?

(ii) ..... **[2]**

(b) Which quarter had the most tourists every year?

(b) ..... **[1]**

(c) Describe the change in the number of tourists in the first quarter of each year from 2011 to 2013.

.....

..... **[1]**

9 Here are the ingredients for a recipe for making Chocolate Chip Muffins.

Chocolate Chip Muffins (makes 12 muffins)
240 g flour
50 g butter
75 g sugar
170 g chocolate chips
230 ml milk
2 eggs

(a) Riya uses the recipe to make 18 muffins.

(i) How many eggs will she use?

(a)(i) ..... **[1]**

(ii) How much milk will she use?

(ii) ..... ml **[2]**

(b) Corrie is going to make some muffins, using this recipe, for a party.
He only has 300 g of sugar.
He has plenty of all the other ingredients.

What is the largest number of muffins that he can make?

(b) ..... **[2]**

10 (a) 18 is the sum of four consecutive numbers.
These numbers are 3, 4, 5 and 6, because 3 + 4 + 5 + 6 = 18.

(i) Find **two** consecutive numbers that have a **sum** of 165.

(a)(i) ..... and ..... **[1]**

(ii) Find **three** consecutive numbers that have a **sum** of 69.

(ii) ..... , ... , ... **[1]**

(b) 30 is the product of two consecutive numbers.
These numbers are 5 and 6 because $5 \times 6 = 30$.

(i) Find **two** consecutive numbers that have a **product** of 420.

(b)(i) ..... and ..... **[1]**

(ii) Explain, without doing any calculations, why 863 **cannot** be the product of two consecutive numbers.

.....

..... **[1]**

11* Sophia and Oliver both earn £345 a week.

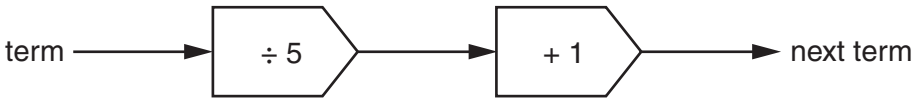
Sophia says 'I will save $\frac{2}{15}$ of my weekly wage'.

Oliver says 'I will save 14% of my weekly wage'.

Who will save the most?
Show how you decide.

..... **[4]**

12 Sequences can be formed using this rule.



(a) The first term of a sequence is 30.

(i) Use the rule to write down the second term of this sequence.

(a)(i) ..... **[1]**

(ii) Use the rule to write down the third term of this sequence.

(ii) ..... **[1]**

(b) The first term of a **different** sequence using this rule is 8.

Write down the third term of this sequence.

(b) ..... **[2]**

13 Zara finds that the maximum temperatures, in degrees Celsius, for the last four days in a holiday resort were

18 25 18 21.

(a) Work out the mean of these four temperatures.

(a) ..... °C **[2]**

(b) Zara decides that she will go to stay in the holiday resort if the mean maximum temperature for the last two weeks is higher than 20°C.
She knows that the mean maximum temperature for the ten days before these four days was 19.7°C.

Will Zara go to stay in the holiday resort?
Show how you decide.

.....

.....

..... **[3]**

14 Courtney owns a field.
The field is a rectangle with length 287 m and width 96 m.

Not to scale

Courtney needs to find the area of the field in hectares.
One hectare is 10 000 m^2.

Work out the area of the field in hectares.
Give your answer correct to 1 decimal place.

..... hectares **[4]**

15 **(a)** A fair six-sided dice, numbered from 1 to 6, is thrown.

Work out the probability that the number on the dice is

(i) 2,

(a)(i) ..... **[1]**

(ii) odd,

(ii) ..... **[1]**

(iii) greater than 6.

(iii) ..... **[1]**

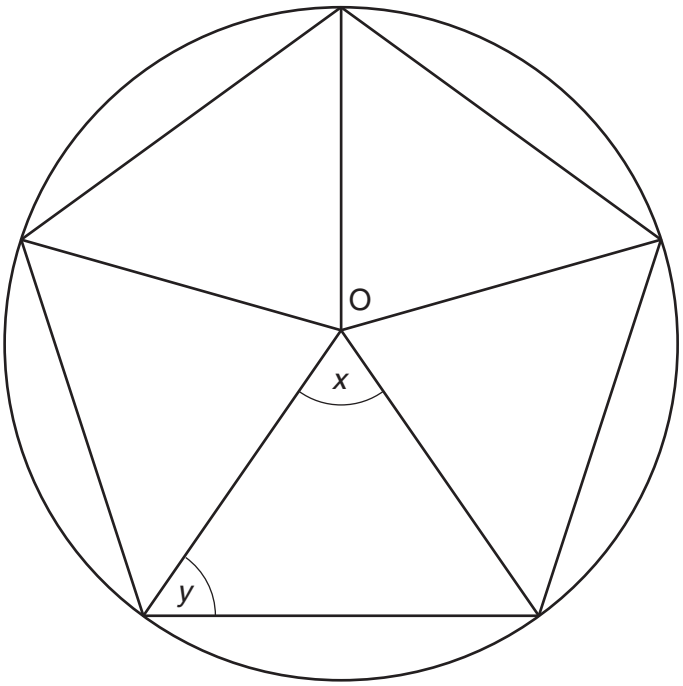
(b) A biased four-sided dice, numbered from 1 to 4, is thrown.
This table shows the probabilities of some of the outcomes.

Outcome	Probability
1	$\frac{3}{20}$
2	$\frac{1}{4}$
3	
4	$\frac{2}{5}$

What is the probability that the number on the dice is 3?

(b) ..... **[3]**

16 This diagram represents a regular pentagon with its vertices on the circumference of a circle, centre O.



Not to scale

(a) Work out angle *x*.

(a) ..... ° **[2]**

(b) Work out angle *y*.

(b) ..... ° **[2]**

(c) Work out the sum of the interior angles of a regular pentagon.

(c) ..... ° **[2]**

17 **(a)** Work out.

$2^4 + 7^2$

(a) ..... **[2]**

(b) Work out.

$$\frac{4.8 + 7.1}{1.9 \times 0.3}$$

Give your answer correct to 1 decimal place.

(b) ..... **[2]**

(c) Find the cube root of 729 000.

(c) ..... **[1]**

(d) Work out the reciprocal of 1.25.

(d) ..... **[1]**

18* Solve using algebra.

$7x - 13 = x + 8$

..... **[3]**

19 **(a)** Solve this inequality.

$6x + 5 > 23$

(a) ..... **[2]**

(b) Rearrange this formula to make r the subject.

$p = 3r - 7$

(b) ..... **[2]**

20 Eastfield School held a sponsored swim to raise money for charity.
Twenty students entered the sponsored swim.
The number of lengths completed by each student is listed below.

34	32	40	38	52	25	45	62	21	42
41	53	48	28	60	45	36	43	57	34

(a) Complete this stem and leaf diagram to represent the data.

2	
3	
4	
5	
6	

Key: 3 | 4 represents 34 lengths

[3]

(b) Find the median number of lengths completed.

(b) ..... lengths **[2]**

(c) What fraction of the group completed fewer than 40 lengths?
Give your answer in its simplest form.

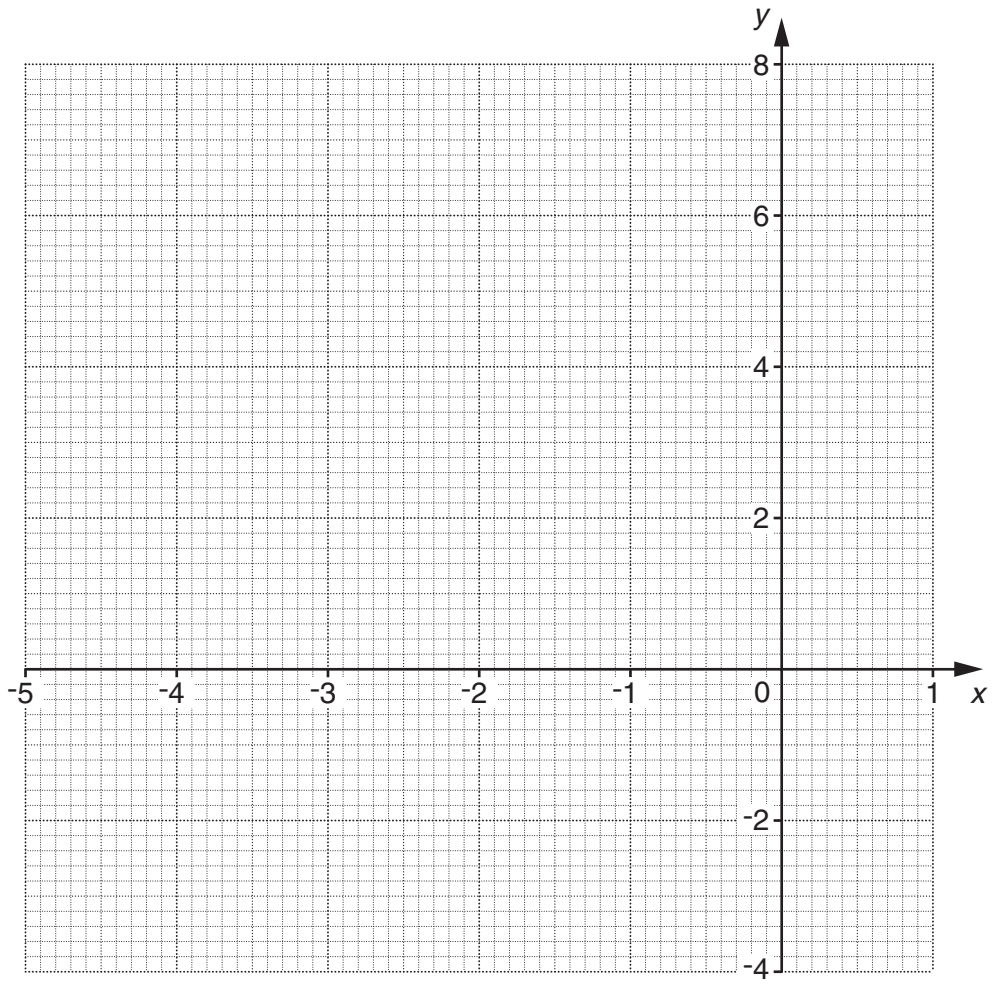
(c) ..... **[2]**

21 **(a)** Complete the table for $y = x^2 + 4x + 2$.

x	-5	-4	-3	-2	-1	0	1
y	7	2	-1		-1	2	7

[1]

(b) Draw the graph of $y = x^2 + 4x + 2$ for values of x from -5 to 1.



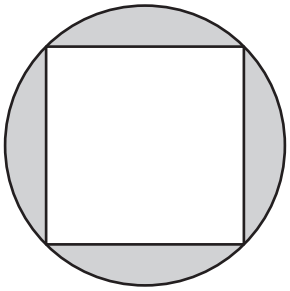
[2]

(c) Use your graph to solve $x^2 + 4x + 2 = 0$.

(c) $x =$ ..... or $x =$ ..... **[2]**

TURN OVER FOR QUESTION 22

22 The diagram shows a company logo.
It is a square inside a circle of diameter 6 cm.
The vertices of the square lie on the circumference of the circle.



Show that the square has sides of length 4.24 cm, correct to 2 decimal places.

.....

.....

.....

..... **[3]**

END OF QUESTION PAPER