OCR
Oxford Cambridge and RSA

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Thursday 10 November 2016 – Morning

GCSE METHODS IN MATHEMATICS

B392/01 Methods in Mathematics 2 (Foundation Tier)

Candidates answer on the Question Paper.

OCR supplied materials:
None

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

Duration: 1 hour 30 minutes

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. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the bar codes.

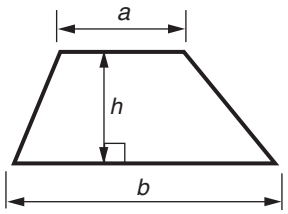
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Your quality of written communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **90**.
- This document consists of **20** pages. Any blank pages are indicated.

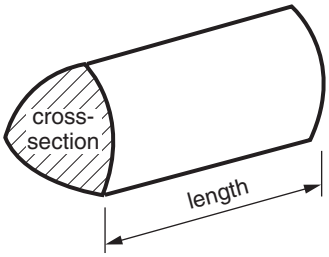
You are permitted to use a calculator for this paper

Formulae Sheet: Foundation Tier

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



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



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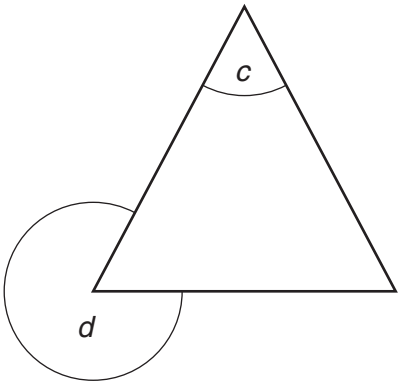
Answer **all** the questions.

1 **(a)** The diagram shows an equilateral triangle.



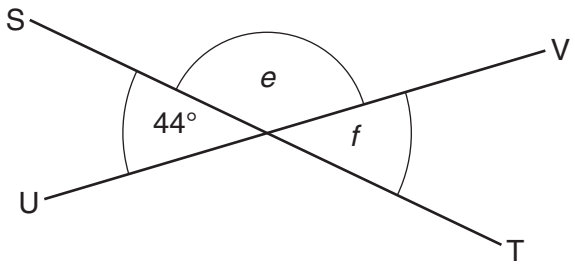
Not to scale

Work out the sizes of angles *c* and *d*.

(a) *c* = ...°

d = ...° **[3]**

(b) ST and UV are straight lines.



Not to scale

Work out the sizes of angles *e* and *f*.

(b) *e* = ...°

f = ...° **[3]**

2 Fill in the table below so that each row contains equivalent fractions, decimals and percentages. The fractions should be in their simplest form.

The first row is done for you.

Fraction (in simplest form)	Decimal	Percentage
$\frac{1}{4}$	0.25	25%
1/10		
	0.4	
		35%

[4]

3 Work out.

(a) **(i)** $^{-}2.7 + 1.4$

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

(ii) $^{-}2.7 \times 1.4$

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

(b) $\frac{4}{9}$ of 6336

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

4 These are the prices of fruit in a shop.

Bananas 20p each	Oranges 30p each	Peaches 35p each

(a) Amir wants to buy some peaches. He has £2 to spend.

(i) What is the greatest number of peaches he can buy?

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

(ii) How much change should he get from £2?

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

(b) Beth has £3 to spend and wants to spend all of it to buy fruit.
She wants to buy at least 2 of each type of fruit.

How many bananas, oranges and peaches can she buy?
You only need to find one way she can spend £3 and buy at least 2 of each type of fruit.

(b) ..... bananas

..... oranges

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

5 This is a sequence of shape patterns.

pattern 1	pattern 2	pattern 3
		X O O O
	X O O	X O O O
X O	X O O	X O O O
X X	X X X	X X X X

(a) Draw pattern 4 in the sequence. **[1]**

(b) Complete the table for patterns 3 and 4.

Pattern number	pattern 1	pattern 2	pattern 3	pattern 4
Number of crosses	3	5		
Number of circles	1	4		

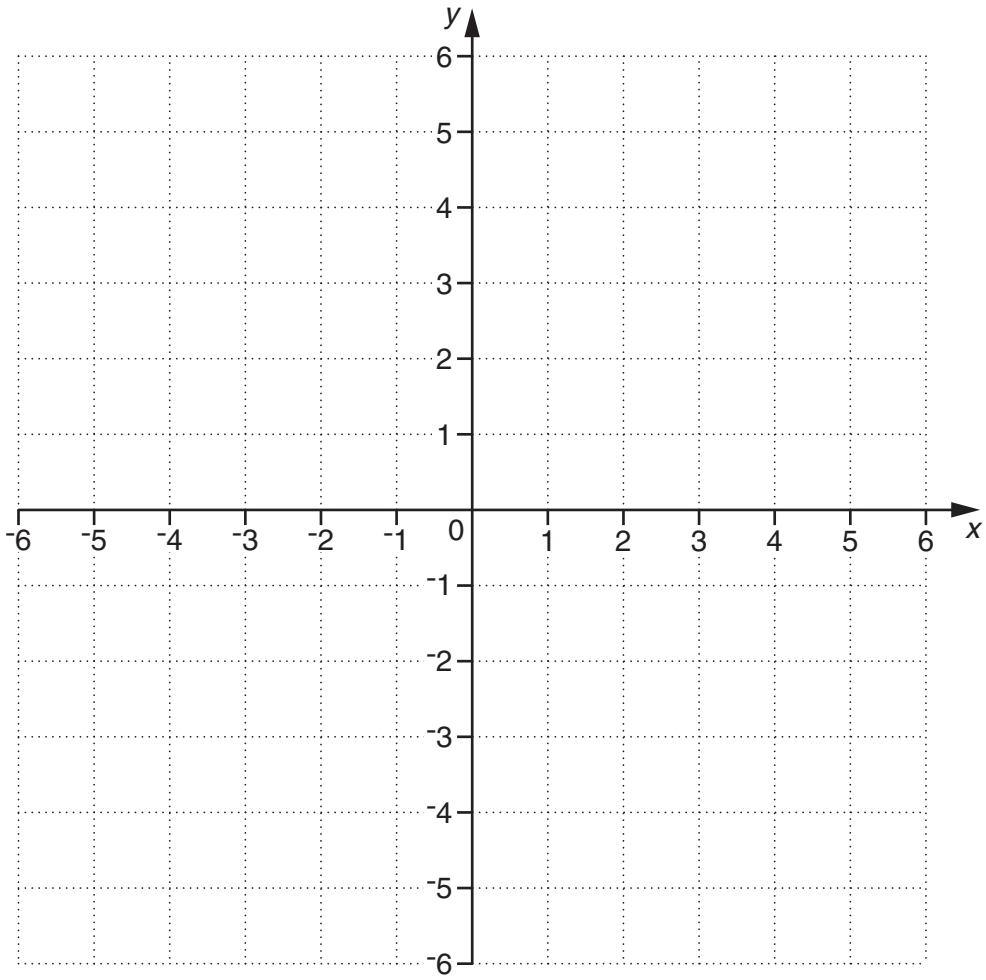
[1]

(c) Work out the number of crosses and the number of circles in pattern 10.

(c) number of crosses .....

number of circles ..... **[4]**

6



(a) Plot the points A (-3, 4) and B (5, -4). **[2]**

(b) Find the coordinates of the midpoint of the line segment AB.

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

7 The formula $k = 1.6m$ is used to convert the number of miles, m, to the number of kilometres, k.

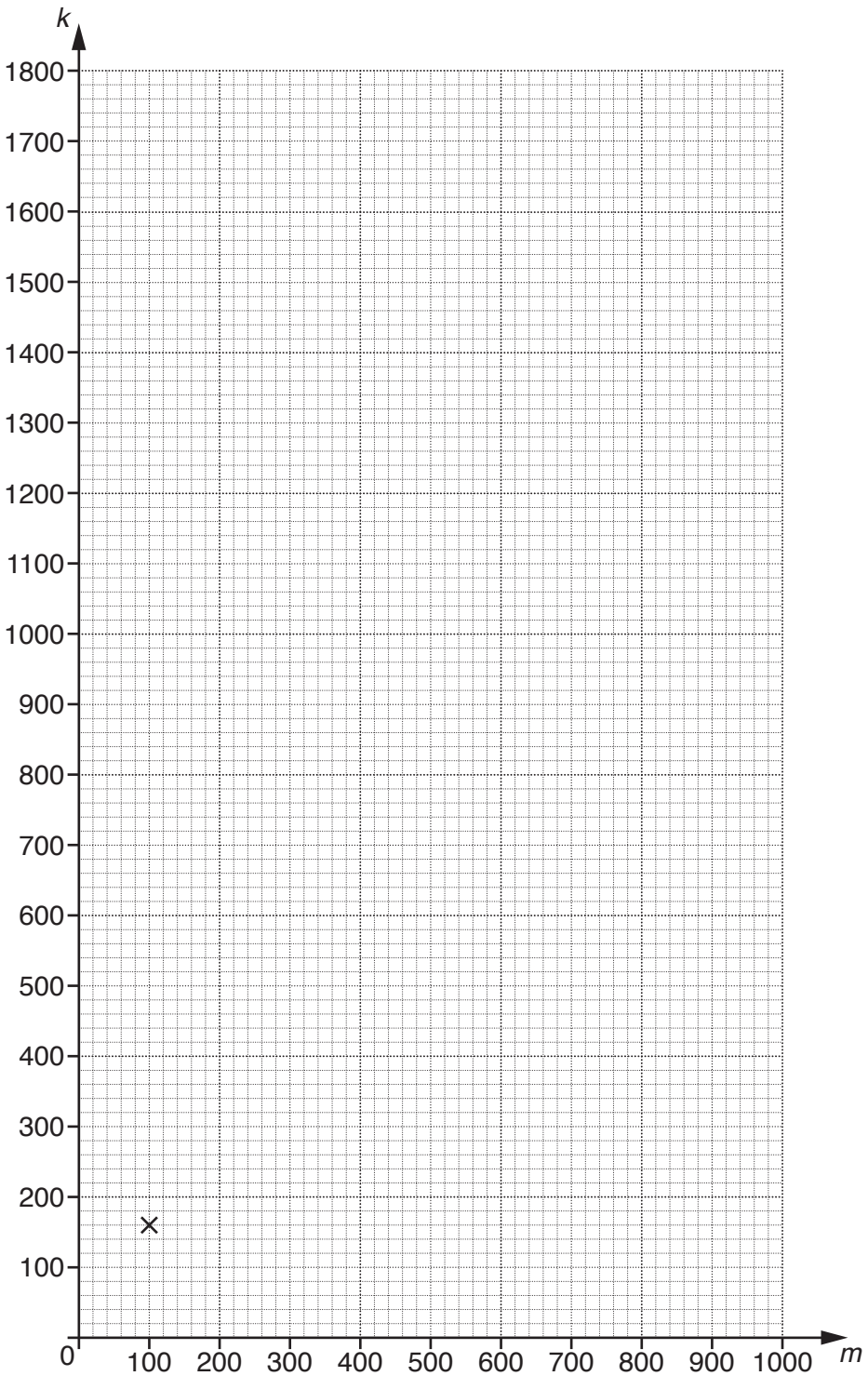
(a) Complete the table for $k = 1.6m$.

m	100	200	500	1000
k	160			

[1]

(b) The point (100, 60) is plotted on the grid.

Use the values in the table to plot three more points.
Draw the graph of $k = 1.6m$.



[2]

(c)* Jules drove 650 miles on holiday in England.
Mia drove 920 kilometres on holiday in Belgium.

Who drove further and by how much?

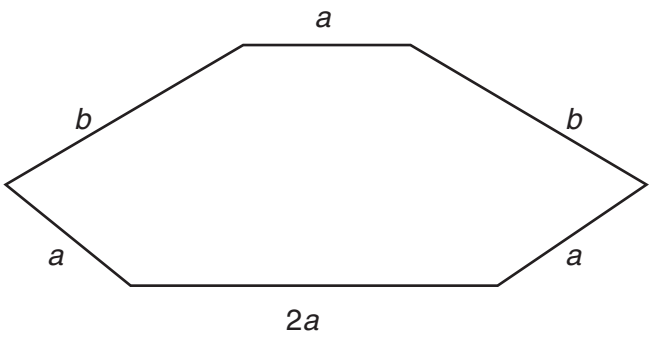
(c) ..... drove further by ..... **[3]**

8 Decide whether each of these statements is true or false.
Justify each decision using calculations.

Statement	True or false	Calculation
30% of £20 is more than 20% of £30		
$(\frac{1}{2})^2$ is greater than $\frac{1}{2}$		

[4]

9 **(a)** All lengths in this hexagon are in centimetres.



Not to scale

(i) Write a formula for the perimeter, P, in terms of a and b.

(a)(i) $P =$ ..... **[1]**

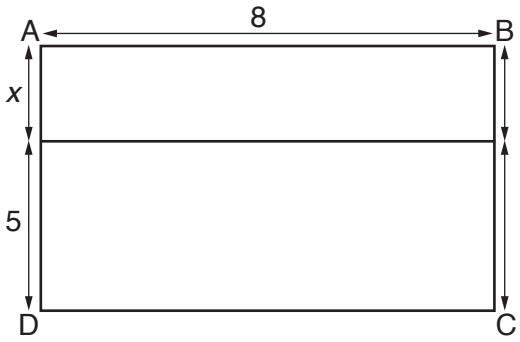
(ii) Work out the value of P when $a = 4$ and $b = 7$.

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

(iii) Work out the value of b when $P = 49$ and $a = 6$.

(iii) ..... **[3]**

(b) All lengths in this diagram are in centimetres.



Not to scale

The area of rectangle ABCD is 76 cm^2.

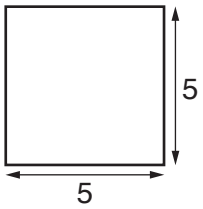
Work out the value of x.

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

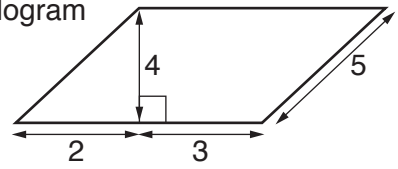
10 These diagrams show four shapes.
The dimensions of the shapes are shown on the diagrams. All measurements are in centimetres.
The diagrams are not to scale.

Arrange the four shapes in order of area, smallest first.
Show the areas you calculate to justify your order of shapes.

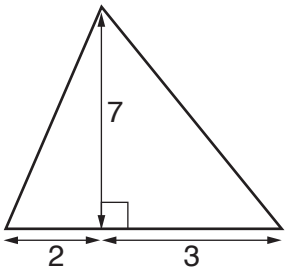
Square



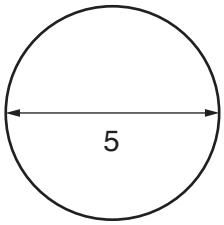
Parallelogram



Triangle



Circle

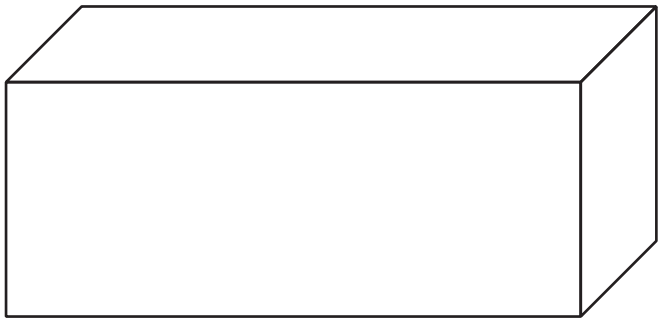


Shapes in order of area.

..... **[8]**

smallest

11 **(a)** Nina arranges 200 one-centimetre cubes to make a cuboid.



The length of the cuboid is 10 cm and the width is 4 cm.

What is the height of the cuboid?

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

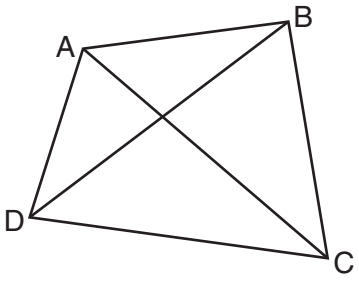
(b) Nina then arranges the 200 one-centimetre cubes to make a cuboid with a **square** base.

Work out **two possible** sets of dimensions for this cuboid.

..... by ..... by .....

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

12* Gary thinks that the angle sum of a quadrilateral is 720°.
His proof is shown below. It is **not** correct.



ABCD is a quadrilateral.
It can be split into four triangles, as shown.
The angle sum of each triangle is 180° so the quadrilateral adds up to 4 x 180° = 720°.

Write a correct proof that the sum of the angles of a quadrilateral is 360°. You are advised to include a diagram as part of your proof.

.....

.....

.....

.....

.....

.....

..... **[2]**

13 Solve.

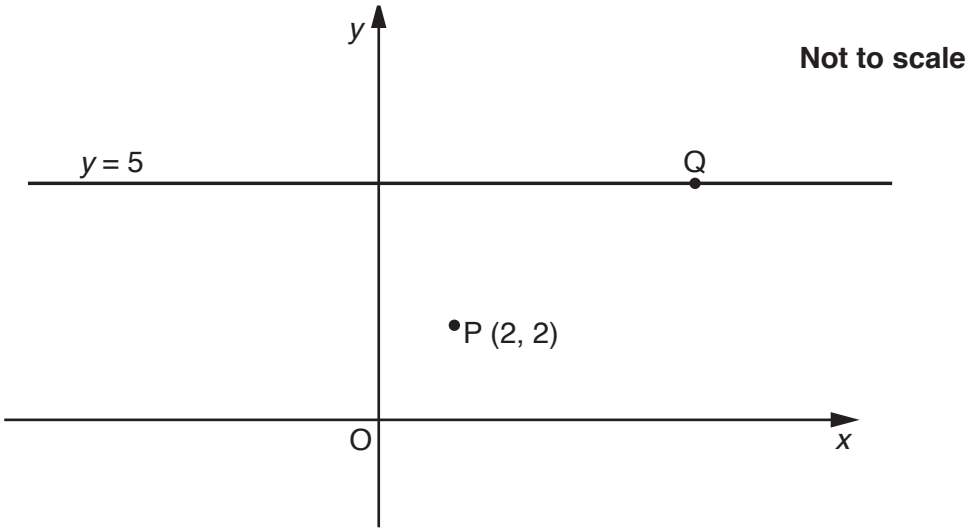
(a) $5(2x - 1) = 8$

(a) ..... **[3]**

(b) $3x + 19 > 4$

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

14 P is the point with coordinates (2, 2). Q is a point on the line $y = 5$.



The distance from P to Q is 5 units.

Find the coordinates of Q.

(..... , ...) **[5]**

15 A club has more men members than women members. The ratio of men to women is 5 : 3.

(a) What fraction of the club members are women?

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

(b) There are 348 women members.

How many men are there?

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

(c) Some new members join the club. They are all women.
The ratio of men to women is now 4 : 3.

How many women joined the club?

(c) ..... **[3]**

(d)* The club sells honey to its members.
A jar containing 250 g of honey costs £1.80.
A jar containing 400 g of honey costs £3.20.

Which jar is better value?

.....

.....

.....

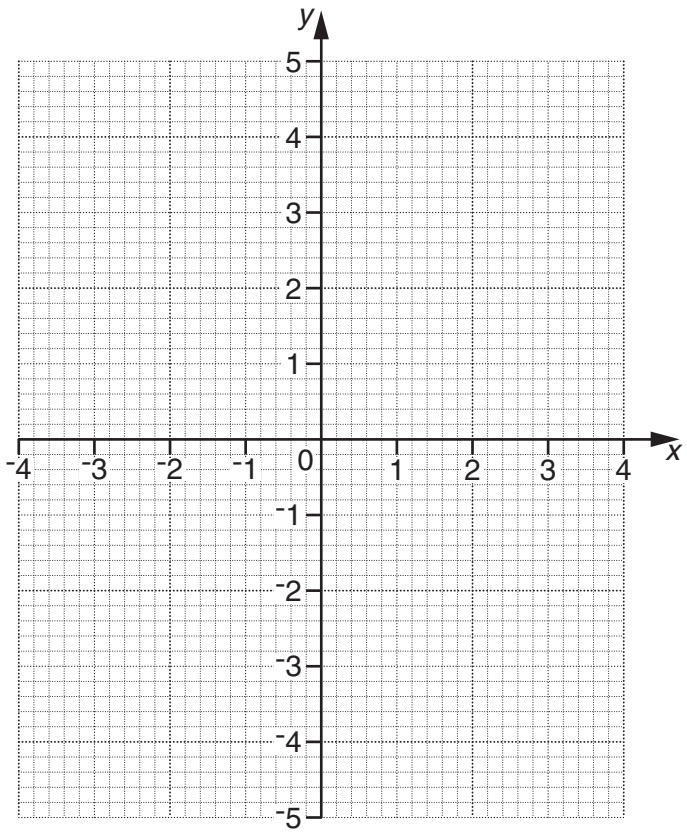
..... **[3]**

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

x	$^-3$	$^-2$	$^-1$	0	1	2	3
y		0		4			$^-5$

[2]

(b) Draw the graph of $y = 4 - x^2$ for $^-3 \leqslant x \leqslant 3$.



[2]

(c) Use your graph to solve the equation $4 - x^2 = 1$.
Give your answers correct to 1 decimal place.

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

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).