F

OCR
Oxford Cambridge and RSA

Monday 8th June 2015 – Morning

GCSE METHODS IN MATHEMATICS

B391/01   Methods in Mathematics 1 (Foundation Tier)

Duration: 1 hour

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.
*   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.
*   Quality of written communication will be assessed in questions marked with an asterisk (*).
*   The total number of marks for this paper is **60**.
*   This document consists of **16** pages. Any blank pages are indicated.

WARNING

No calculator can be used for this paper

OCR is an exempt Charity

Turn over
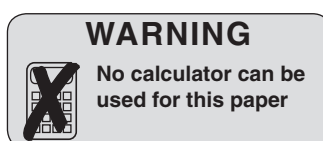
Formulae Sheet: Foundation Tier

Area of trapezium $= \frac{1}{2}(a + b)h$
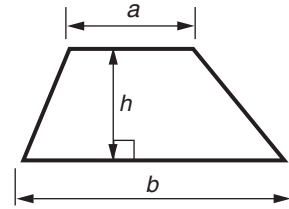
Volume of prism = (area of cross-section) × length

PLEASE DO NOT WRITE ON THIS PAGE

Answer **all** the questions.

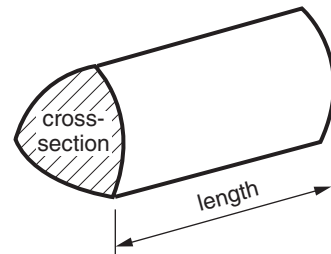1 Write each set of numbers in order from smallest to largest.

   (a) 15 422   15 399   14 927

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

   (b) 0.52   0.277   0.6

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

   (c) $\frac{2}{5}$ $\frac{5}{6}$ $\frac{1}{2}$

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

2 Describe the probability of each of the events in the table.
   Choose words from this list.

   Unlikely   Certain   Evens   Impossible   Likely

Event	Description
Getting a head when you toss an ordinary fair coin.	
Getting the number 3 when you roll an ordinary six-sided fair dice.	
Your birthday this year being on a day of the week which contains the letter y.	
Getting a number greater than 1 when you roll an ordinary six-sided fair dice.	

[4]

3 Work out.

(a) $2146 + 368$

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

(b) $384 - 157$

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

(c) $595 \div 7$

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

(d) 5.3×4

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

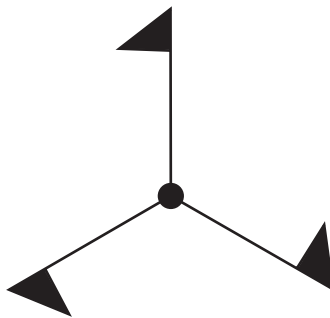**4** **(a)** Shade 6 more squares so that the final pattern has reflection symmetry in line L.

L
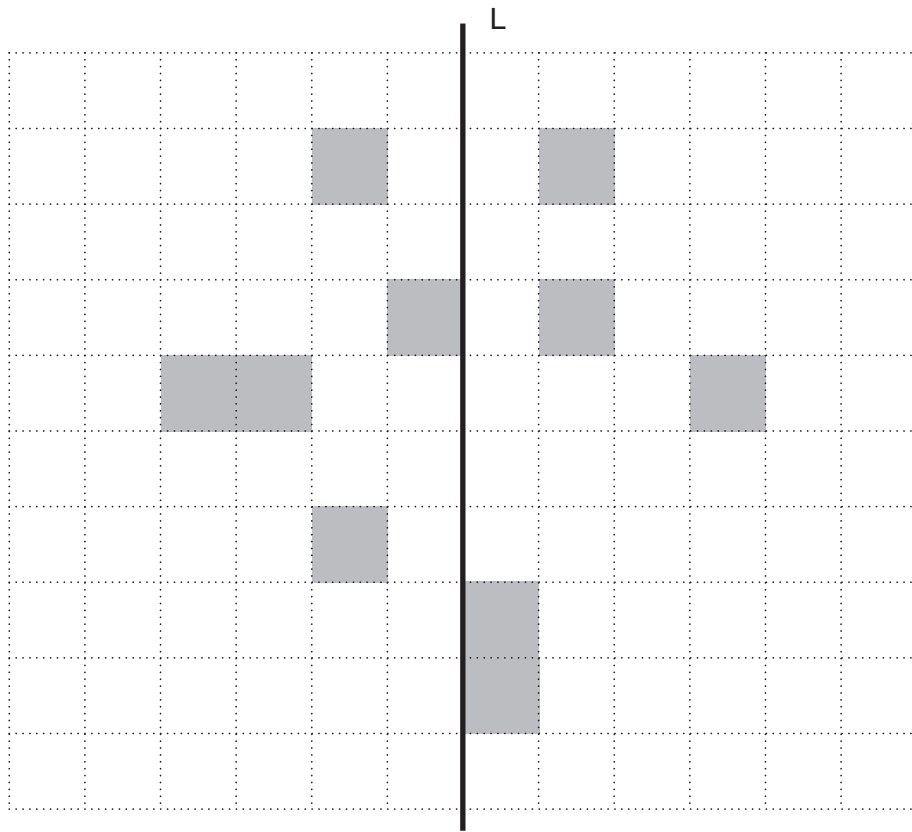
[2]

(b)

(i) What is the order of rotational symmetry of this shape?

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

(ii) What is the angle of rotation from one flag to the next?

(ii) .... ° **[1]**

Turn over

5 In a game of 'Spinner' at a fête, you win a prize if the pointer stops on the number 6.

There are three different spinners to choose from.
Each spinner is split into equal sectors with an equal probability of the pointer landing on each sector.
You pay the same amount whichever spinner you use.

Show why Spinner C gives you the best chance of winning a prize.

Spinner A

Spinner B

Spinner C

....

....

....

....

....

....

....

.... **[4]**

6 (a) Work out.

(i) $36 \div (6 + 3)$

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

(ii) $(5 + 6)^2$

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

(b) Samir says
'Three add four is seven then multiplied by two gives an answer of fourteen. But when I put 3 + 4 × 2 in my calculator it gives me an answer of eleven. My calculator must have gone wrong.'

Has Samir's calculator gone wrong? Explain your answer.

....

....

....

.... **[2]**

7 Solve.

(a) $\frac{x}{3} = 6$

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

(b) $4x = 32$

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

(c) $9x - 10 = 35$

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

8* Kevin wants to paint this wall. The wall has a rectangular window in it.

9 m

Not to scale

Window

1.5 m

3 m

7 m
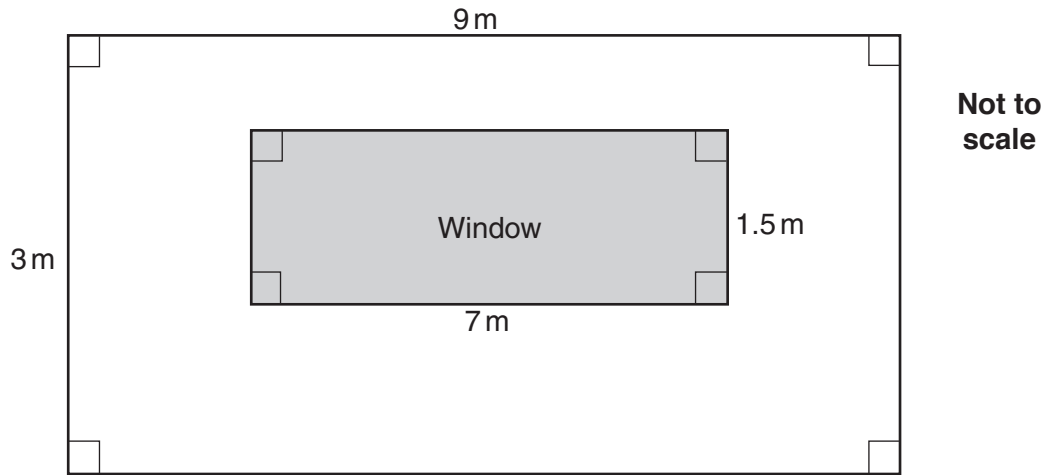
Each tin of paint covers 7 square metres and costs £14.99.

How much will it cost Kevin to buy enough paint for his wall?

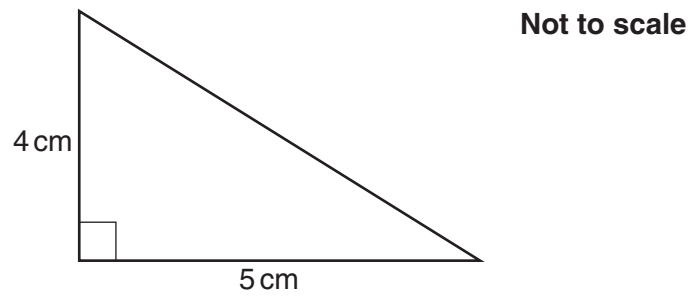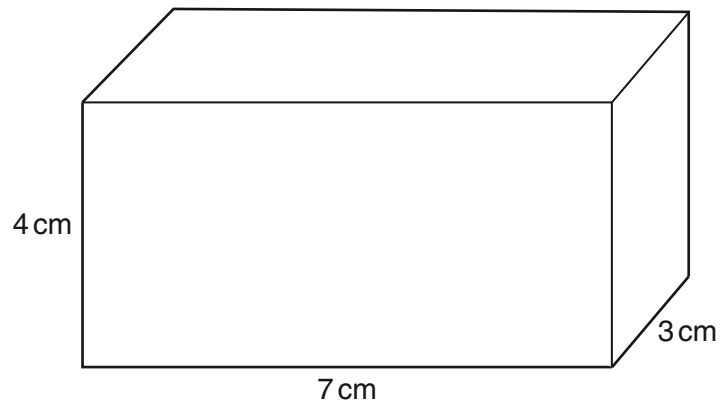..

....

....

....

....

....

....

....

....

....

Cost of paint is £ .... **[5]**

9 **(a)** Calculate the area of this triangle.

Not to scale

4 cm

5 cm

(a) .... cm² **[1]**

(b) Calculate the volume of this cuboid.

4 cm

7 cm

3 cm

(b) .... cm³ **[2]**

10 (a) Mrs Hill puts on the board an algebraic rule to multiply out brackets.

$$a(b + c) = ab + ac$$

She wants the class to use the rule to do some multiplications.
She gives them this example.

$$4 \times 7 = 4(5 + 2)$$
$$= 20 + 8$$
$$= 28$$

(i) Fill in the missing numbers to show one way of working out 5×17.

$$5 \times 17 = 5\,(8 + \text{.........}) = 40 \ + \text{.........} = 85$$

[1]

(ii) Fill in the missing numbers to show a **different** way of working out 5×17.

$$5 \times 17 = 5\,(\text{.........} + \text{.........}) = \text{.........} \ + \text{.........} = 85$$

[2]

(iii) Fill in the missing numbers to show another way of working out 5×17.

$$5 \times 17 = 5\,(20 - \text{........}) = \text{........} - \text{........} = 85$$

[2]

(b) (i) Multiply out the brackets.
$$3(x + 2y)$$

(b)(i) .... [2]

(ii) Factorise.
$$2x + 10y$$

(ii) .... [1]

11 Points A, B and C are plotted on this one-centimetre grid.
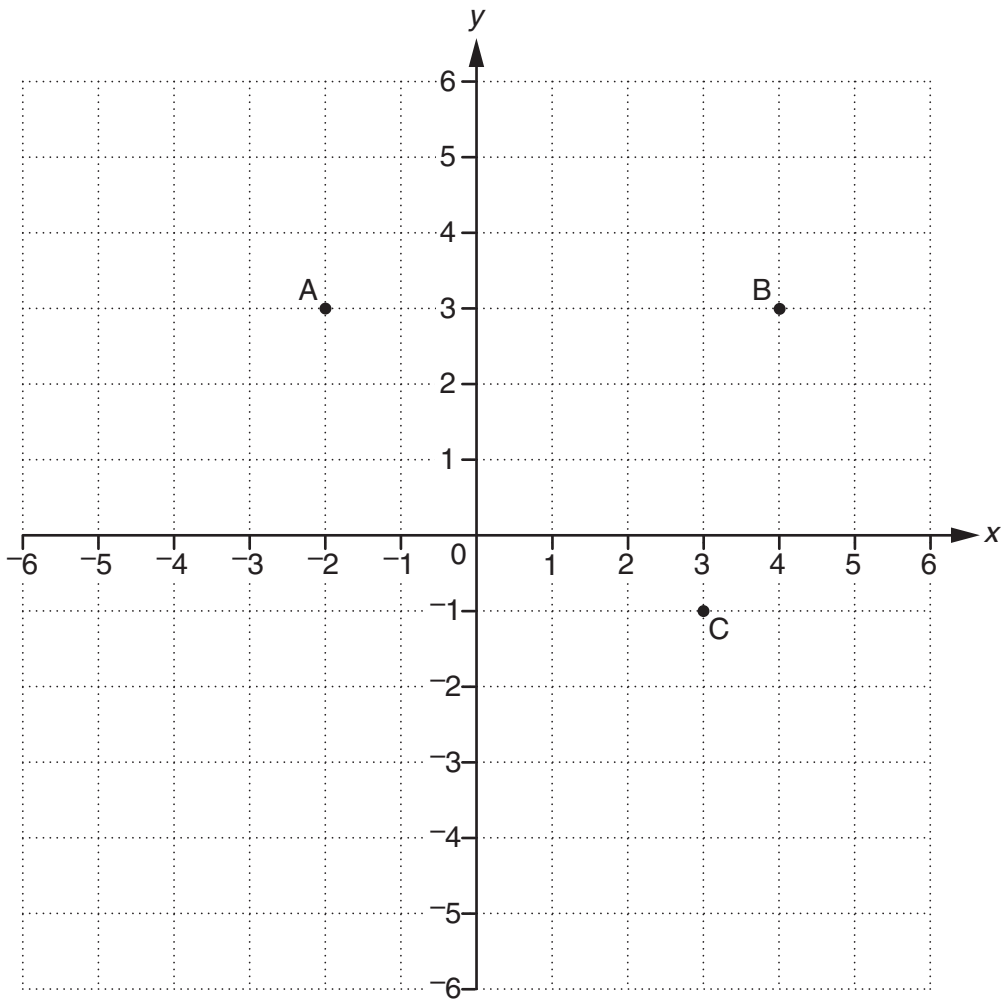
(a) Write down the coordinates of point B.

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

(b) Plot the point (⁻3, ⁻1) on the grid and label it D. **[1]**

(c) **(i)** What is the name of the shape ABCD?

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

(ii) What is the area of the shape ABCD?

(ii) .... cm² **[1]**

Turn over

12 (a) Work out.

    (i) 2^3

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

    (ii) $\sqrt{36}$

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

(b) Write using index notation.

    $5 \times 5 \times 5 \times 5$

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

(c) Simplify.

    $a^3 \times a^4$

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

(d) Work out.

    $3^9 \div 3^6$

          (d) .... **[2]**

13 The Venn diagram below shows the sets $\mathscr{E}$ and P.
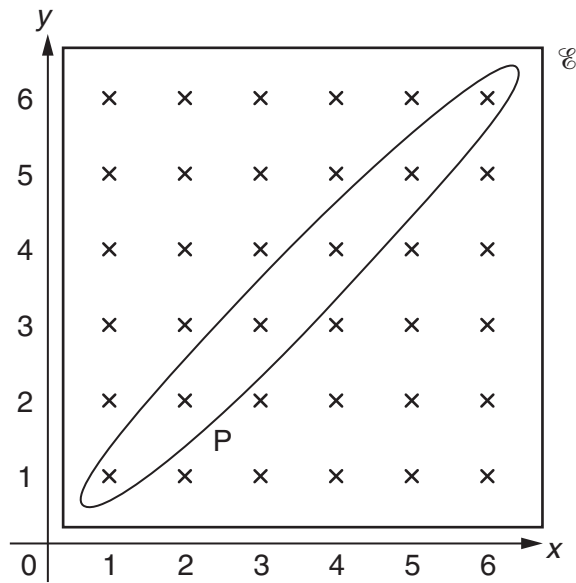
$\mathscr{E}$ = {points where each of the coordinates is an integer from 1 to 6}

(a) (i) Complete this statement.

P = {points where the *x* and *y* coordinates are ....} **[1]**

(ii) Q = {points where the *x* and *y* coordinates add up to 10}

Show the set Q on the Venn diagram above. **[1]**

(b) How many members has the set P ∩ Q?

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

Turn over

14 The diagram shows the **cross-section** of a swimming pool.
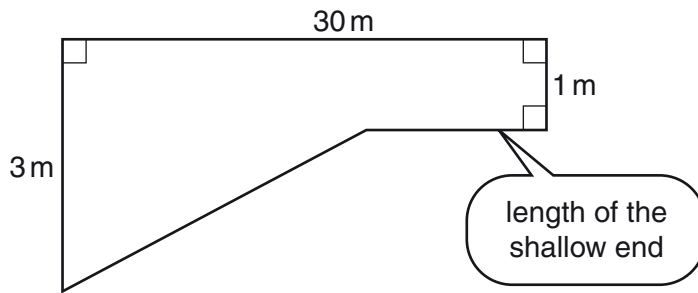
The depth of the shallow end is 1 m and the maximum depth at the deep end is 3 m.
The length of the pool is 30 m.
The area of the cross-section of the pool is 48 m^2.

Find the length of the shallow end.

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

END OF QUESTION PAPER

15

BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE