F

Monday 17 June 2013 – Morning

GCSE METHODS IN MATHEMATICS

B391/01 Methods in Mathematics 1 (Foundation Tier)
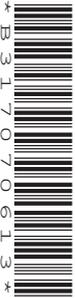
Candidate forename		Candidate surname	

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.
• Your Quality of Written Communication is 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

This paper has been pre modified for carrier language

Turn over

Formulae Sheet: Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$
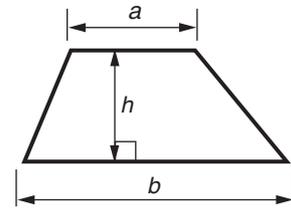
Volume of prism = (area of cross-section) × length
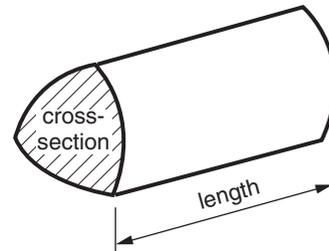
PLEASE DO NOT WRITE ON THIS PAGE

1 Write each set of numbers in order from lowest to highest.

   (a) 0.4   0.39   0.369

   (a) _____ , _____ , _____ [1]
   lowest

   (b) $\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{7}$

   (b) _____ , _____ , _____ [1]
   lowest

   (c) 25341   27164   21989

   (c) _____ , _____ , _____ [1]
   lowest

   (d) ‾2   3   ‾9

   (d) _____ , _____ , _____ [1]
   lowest

Turn over

2 One year a City Council collected 43 820 tonnes of rubbish.

 (a) Write

    (i) 43 820 in words,

    _____

    _____ **[1]**

    (ii) 43 820 correct to the nearest hundred,

                                                (a)(ii) _____ **[1]**

    (iii) 43 820 correct to 2 significant figures.

                                                (iii) _____ **[1]**

 (b) The Smith family recycled 20 kg out of a total of 80 kg of rubbish.

    (i) Complete the boxes to work out the fraction of rubbish the Smith family recycled.

$$\frac{20}{80} = \frac{\boxed{}}{8} = \frac{1}{\boxed{}}$$ **[2]**

    The Jones family recycled 30 kg out of a total of 150 kg of rubbish.

    (ii)* Which family recycled the larger fraction of rubbish?

   _____

    _____

    _____

    _____ **[3]**

3 Here are some words which describe probability.

The probability scale shows some possible values.

Join each word to the value which it fits best.
The first one has been done for you.

likely

impossible

unlikely

certain

evens

| 0 |
| 0.2 |
| 0.5 |
| 0.8 |
| 1 |
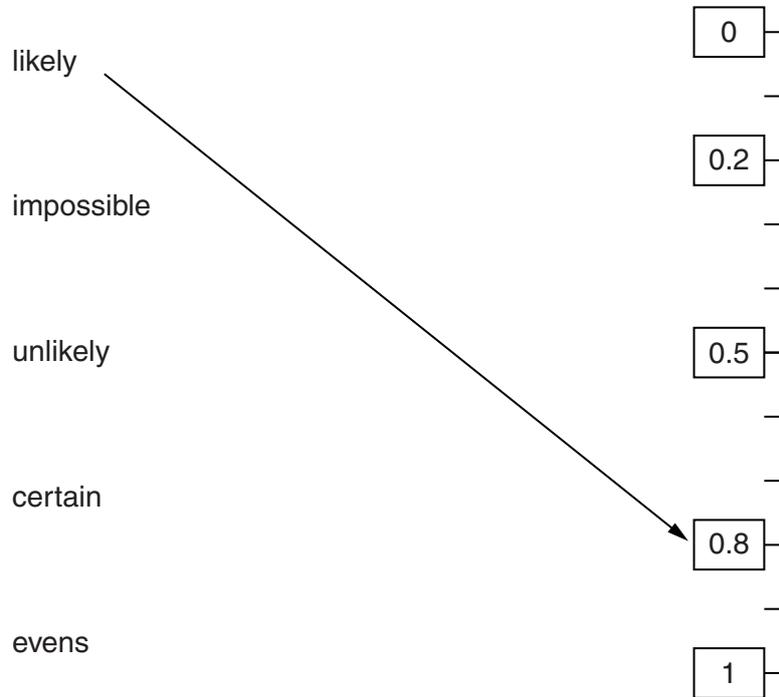
[2]

4 (a) Solve.

(i) $5x = 15$

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

(ii) $3x + 2 = 14$

(ii) _____ **[2]**

**(b)** Work out the value of $2a + 3b$ when $a = 7$ and $b = 4$.

(b) _____ **[2]**

Turn over

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

L
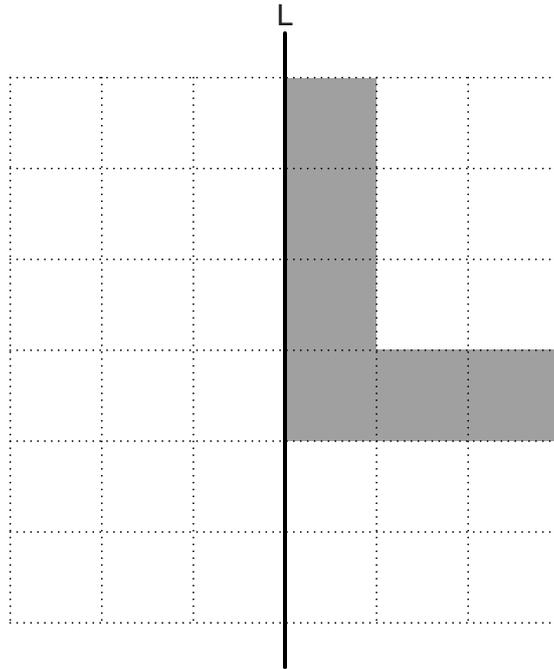
[1]

(b) Shade 6 more squares so that the final pattern has rotation symmetry of order 4 about the centre marked ●.
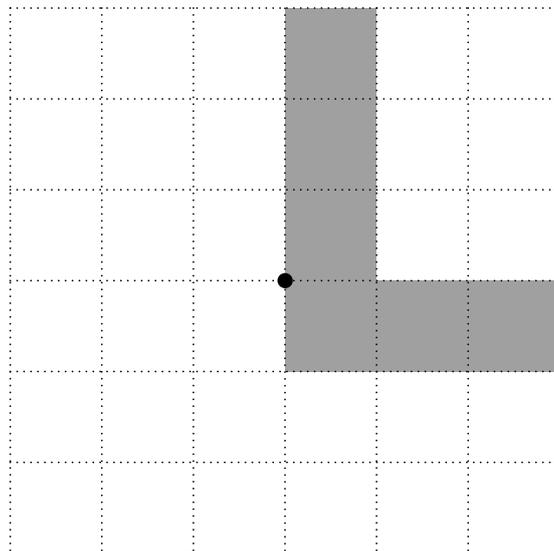
[2]

**6** Jake is playing with some bricks.
Each brick is a cube and they are identical.

(a) He arranges some bricks on the floor in a square layer like this.
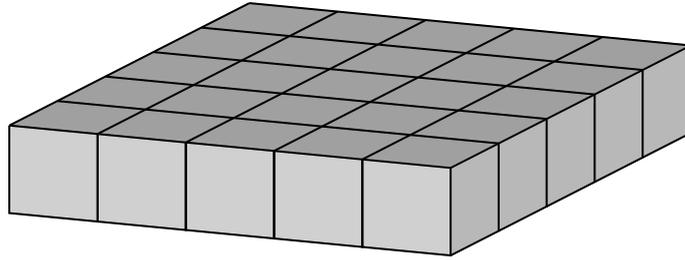
How many bricks are in this layer?

(a) _____ **[1]**

(b) Jake puts more bricks on top of this layer to make a cube.
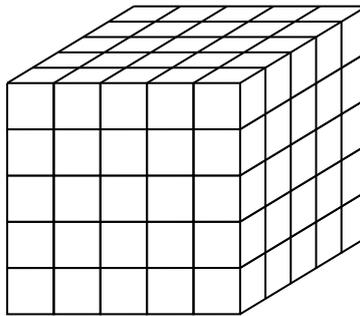
How many bricks are in this cube?

(b) _____ **[2]**

7 Misha belongs to a swimming club. She took part in a sponsored swim.

(a) Misha swam 8 lengths of the pool.

(i) She was sponsored £6 for every length she swam.

How much money did she raise?

(a)(i) £ _____ **[1]**

(ii) Each length of the pool is 25 m.

How many metres did she swim?

(ii) _____ m **[1]**

(b) The club raised £1228 this year. Last year they raised £843.

(i) What is the total amount of money they have raised in these two years?

(b)(i) £ _____ **[1]**

(ii) How much more money was raised this year than last year?

(ii) £ _____ **[2]**

8 A toy company makes small discs, called Chuckies. Each one is sold in a packet.
The company states these probabilities of getting the four colours available.

Colour	Red	Blue	Yellow	Gold
Probability	0.3	0.4		0.1

(a) Work out the probability of getting yellow.

(a) _____ **[2]**

(b) Adam buys 20 Chuckies.

  (i) How many gold ones should he expect to get?

(b)(i) _____ **[2]**

  (ii) When Adam buys 20 Chuckies he does not get any gold ones.
Adam says that the company's probability for gold cannot be correct.

Explain why Adam is wrong.

_____

_____

_____ **[1]**

9 Adam plays a game where he throws his Chuckie onto this grid.
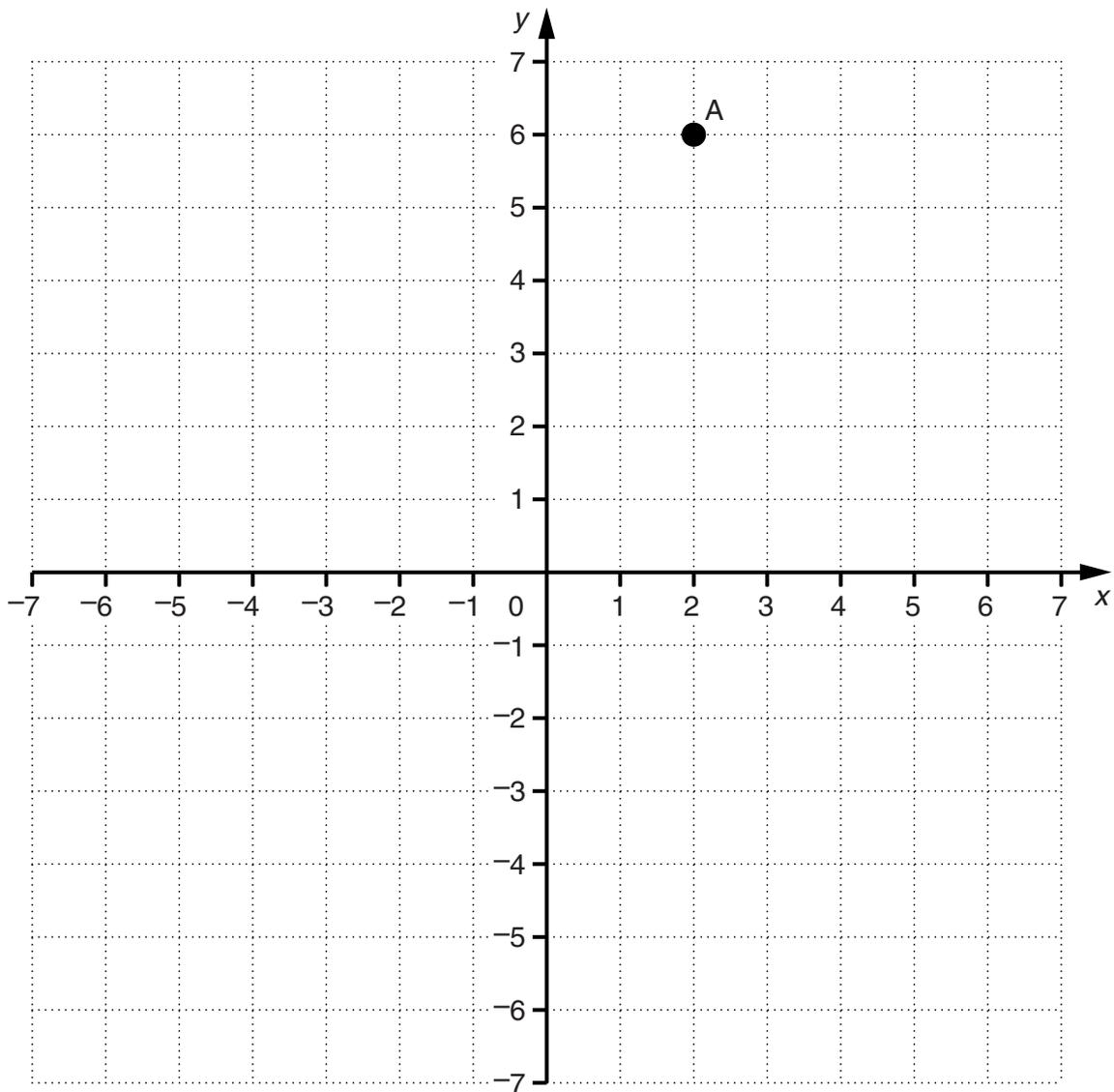
(a) Adam's first throw lands at A.

Write down the coordinates of point A.

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

(b) His next two throws land at point B (0, 2) and point C (−2, 4).

Plot these points on the grid. **[2]**

(c) In the game, Adam has to find the **product** of the *x*-coordinate and the *y*-coordinate of the point where his Chuckie lands.

Fill in the boxes below to show the products for points B and C.

B $\quad 0 \times 2 =$ ▢

C $\quad {}^{-}2 \times 4 =$ ▢ **[2]**

(d) Adam now has to try and land his Chuckie on a point on the same grid where the product of the *x*-coordinate and the *y*-coordinate equals **10 or ⁻10**.

(i) The coordinates of one possible point are given below.

Find the coordinates of **two** other points where the product equals 10.

(d)(i) (___**2**___ , ___**5**___) (_____ , _____) (_____ , _____) **[2]**

(ii) Find the coordinates of two points where the product equals ⁻10.

(ii) (_____ , _____) (_____ , _____) **[2]**

10 In this shape

- AB = GH = 3 cm
- BC = CD = EF = FG = 4 cm
- BE = DG = 5 cm.

A

3

B   ☐

4

D

C

5

Not to scale

E   ☐

F

G

H
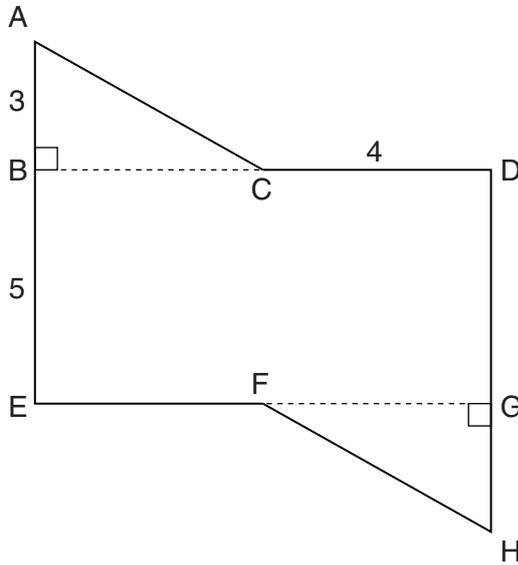
(a) What type of symmetry does this shape have?

(a) _____ **[1]**

(b) Find the area of

(i) the triangle ABC,

(b)(i) _____ cm² **[2]**

(ii) the complete shape.

(ii) _____ cm² **[2]**

11 Here is a completed algebra addition puzzle.

+	y	$x + 4y$
$2x$	$2x + y$	$3x + 4y$

$2x + x + 4y = 3x + 4y$

Complete the following algebra addition puzzle.

+	$3x$	$x + y$
$5x$	_____	_____
_____	_____	$4x + 3y$

[4]

12 Anne and Waqar have each written a number on a piece of paper.
Anne's number is three times Waqar's number.
The difference between the two numbers is 5.
The numbers are not whole numbers.

Find the two numbers.

Anne's number _____

Waqar's number _____ **[3]**

Turn over

13 $\mathscr{E}$ = {integers from 1 to 12}
  P = {prime numbers}
  F = {factors of 12}

  (a) Complete the Venn diagram to show all the members of the set $\mathscr{E}$.
  Some members have been done for you.

$\mathscr{E}$

```
       P
         5               F
              3     6
                      1
   8
```
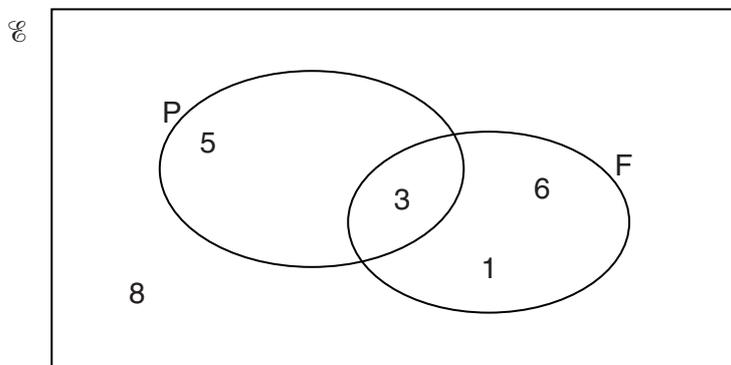
[3]

  (b) List the members of P ∩ F.

(b) _____ [1]

END OF QUESTION PAPER

BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE