OCR
RECOGNISING ACHIEVEMENT

F

Thursday 17 January 2013 – 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.
• 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

OCR is an exempt Charity

Turn over

Formulae Sheet: Foundation Tier

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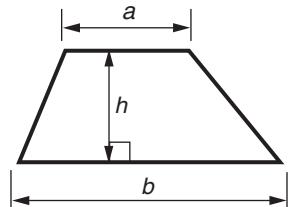
**Volume of prism** = (area of cross-section) × length

PLEASE DO NOT WRITE ON THIS PAGE

**1 (a)** Choose words from this list to complete the statements.

| Segment | Semicircle | Diameter | Sector | Radius |

(i)
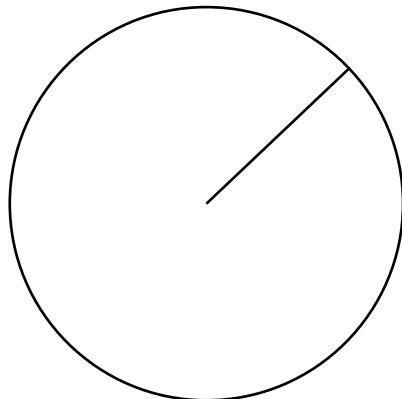
(a)(i) The straight line is a _____ **[1]**

(ii)
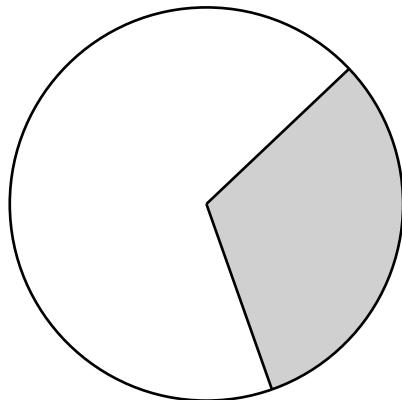
(ii) The shaded shape is a _____ **[1]**

(b) Draw a tangent to this circle.

[1]

Turn over
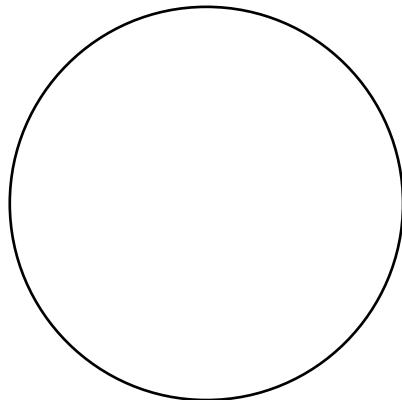
2 **(a)** **(i)** Work out.

4.32 + 5.4

(a)(i) _____ [1]

(ii) How much change should I get from £5 if I spend £2.80?

(ii) £ _____ [1]

(b) Packets of sweets cost 50p each.

How many packets can Janie buy for £9.50?

(b) _____ [2]

3 **(a)** Draw the reflection of the triangle in the mirror line.
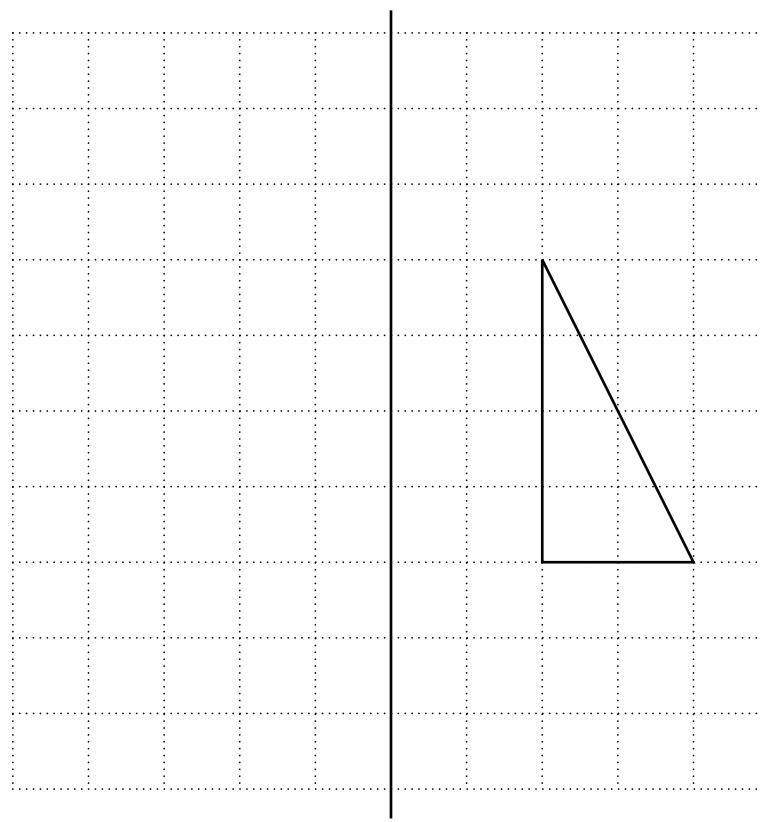
mirror line

[2]

(b) Draw an enlargement of the quadrilateral using scale factor 3.

[2]
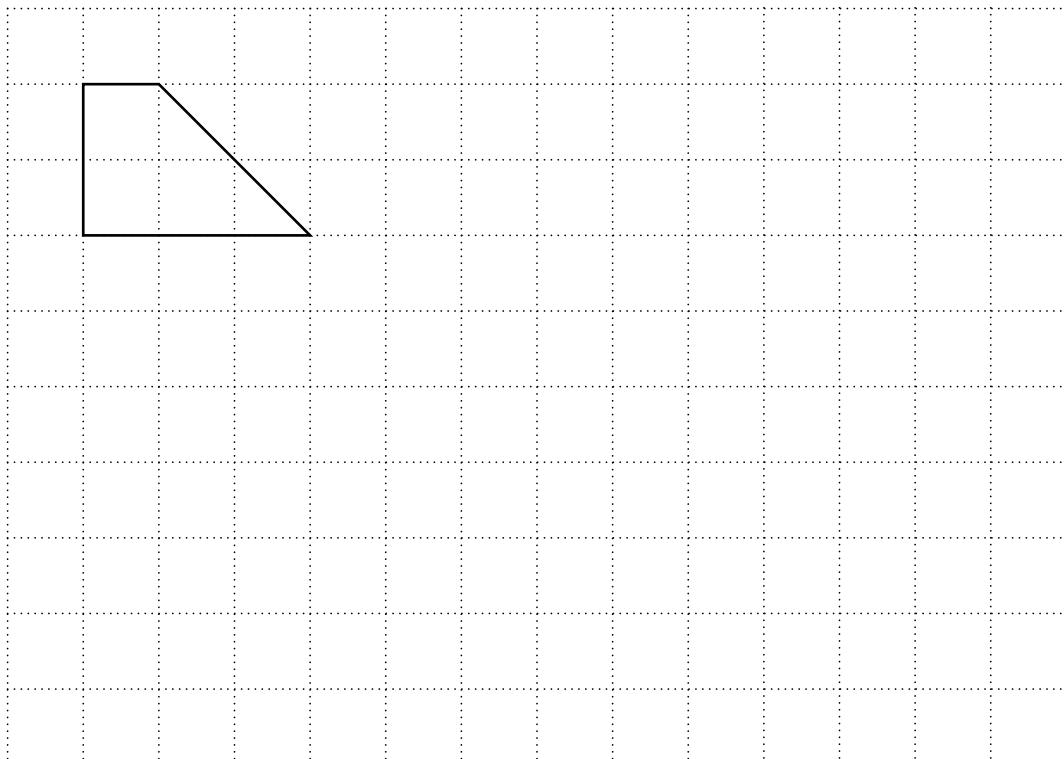
4 In this number puzzle the calculations in each row and column have the same answer 13.

	4		8	
5	×	3	−	2 = 13
	3		2	
7	+	2	+	4 = 13
	1		7	
	=		=	
	13		13	

Put symbols in the circles in the number puzzles below so that the rows and columns have the same answer.
You can use the symbols + , −, ×, or ÷.
You can use the same symbol more than once.

(a)

	3		5	
4	×	3	○	1 = 12
	6		2	
5	○	2	○	9 = 12
	6		2	
	=		=	
	12		12	

[2]

(b)

	8		7	
10	÷	5	+	4 =
	4		5	
5	○	3	○	9 =
	3		6	
	=		=	

[2]

5 A, B and C are three corners of a square.
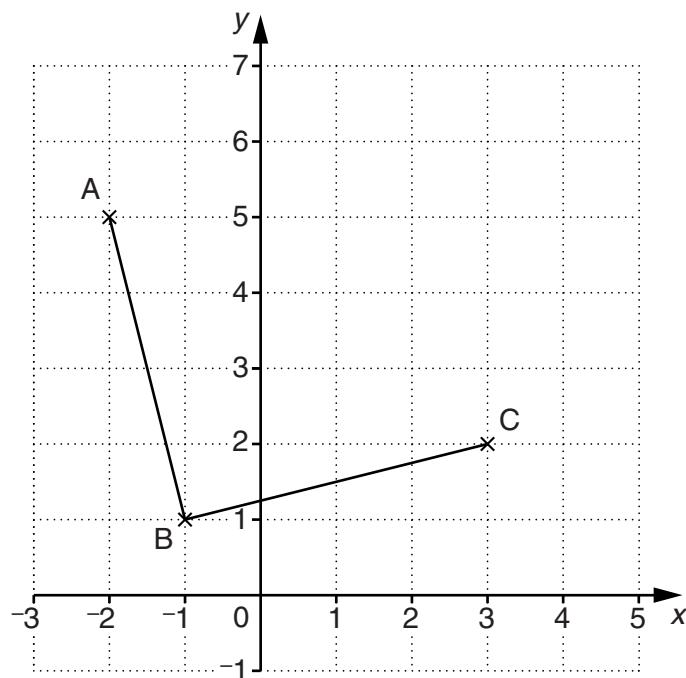
(a) D is the fourth corner of the square.

   (i) Plot the corner D. **[1]**

   (ii) Write down the coordinates of D.

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

(b) Write down the coordinates of A.

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

6 (a) Ethan works out 25.2 × 0.6.

He thinks the answer is 151.22.

How can you tell, without working it out, that his answer must be wrong?

_____ **[1]**

(b) Work out.

(i) 3.2 × 4

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

(ii) 3 ÷ 0.2

(ii) _____ **[1]**

7 On the number line below mark each probability with an arrow.

(a) The probability that it will snow on every day in July in London.
Label the arrow A.

(b) The probability that the name of a day of the week ends in the letter Y.
Label the arrow B.

(c) The probability that you will get an odd number when you throw an ordinary fair dice.
Label the arrow C.

```
0                           0.5                         1
|_____|_____|
```
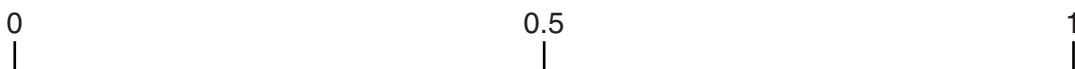
[3]

8 **(a)** Work out.

    (i) $10 + {}^-4 - {}^-5$

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

    (ii) $\dfrac{5}{6}$ of 24

                                        (ii) _____ **[2]**

(b) Work out.

    $\dfrac{1}{4} + \dfrac{5}{8}$

    Give your answer as a fraction in its lowest terms.

                                        (b) _____ **[2]**

Turn over

9 Jane, Xiang and Adam are describing quadrilaterals.

(a) Jane says,

"My quadrilateral has opposite sides equal, adjacent sides not equal and all the angles are right angles".

Give the mathematical name of Jane's shape.

(a) _____ **[1]**

(b) Xiang says,

"My quadrilateral has opposite sides equal, adjacent sides not equal and no right angles".

Give the mathematical name of Xiang's shape.

(b) _____ **[1]**

(c) Adam says,

"My quadrilateral has four equal sides and the diagonals are not equal".

Give the mathematical name of Adam's shape.

(c) _____ **[1]**

10 (a) Solve.

    (i) $x - 5 = 8$

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

    (ii) $2x = 10$

    (ii) _____ **[1]**

(b) Simplify.

    $2n + 4n - 3n$

    (b) _____ **[1]**

(c) Use $a = 4$, $b = 5$ and $c = \dfrac{1}{2}$ to work these out.

    (i) $2a + 3b$

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

    (ii) $3a - 2b + 4c$

    (ii) _____ **[2]**

Turn over

11 Abby, Sanjay and Carrie are playing 'think of a number' .

(a) Abby says, "My number is even and is a factor of 12".

List all the possible numbers that Abby's number could be.

(a) _____ **[2]**

(b) Sanjay says, "My number is a square number and is a multiple of 5".

Give one number that Sanjay's number could be.

(b) _____ **[1]**

**(c)** Carrie says, "If you double my number and add 3 the answer is 21".

What is Carrie's number?

(c) _____ **[2]**

12 Gareth has 50 books altogether.
30 of his books are Sci-Fi books (S).
35 of his books are Paperbacks (P).
20 of the Sci-Fi books are Paperbacks.

This Venn diagram shows the number of each type of book.

(a) Fill in the two missing numbers in the Venn diagram.

$\mathscr{E}$

S

P

10   20   _____   _____
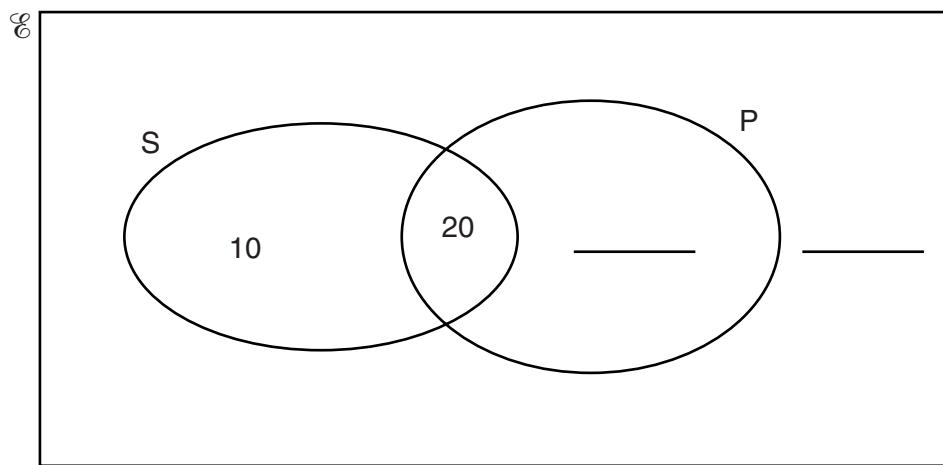
[2]

(b) One of Gareth's 50 books is chosen at random.

Find the probability that it is

(i) a Sci-Fi book that is not a Paperback,

(b)(i) _____ [1]

(ii) not a Paperback and not a Sci-Fi book,

(ii) _____ [1]

(iii) a member of S ∩ P.

(iii) _____ [1]

Turn over

13* The diagram shows a prism.
AB = 6 cm, BC = 8 cm, DF = 10 cm and AD = 11 cm.
Angle ABC = 90° and angle DAC = 90°.
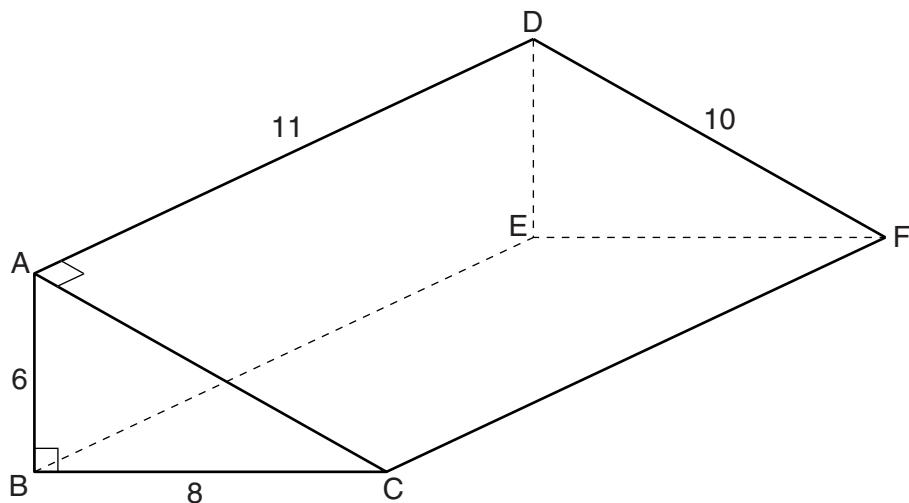
Calculate the total **surface area** of the prism.

_____ cm² **[5]**

14 Ali, Ben, Cara and Danni each throw the same **biased** dice.
They want to find the probability of throwing a six using this dice.
They each throw the dice a different number of times.

These are their results.

	Ali	**Ben**	**Cara**	**Danni**
Number of throws	200	20	100	500
Number of sixes	44	5	15	100

(a) Complete the table below to show the relative frequencies of their results.
Write your answers as decimals.

	Ali	**Ben**	**Cara**	**Danni**
Relative frequency of throwing a six				

[2]

(b) Whose result gives the best estimate of the probability of throwing a six with the biased dice?
Give a reason for your answer.

_____ because _____ [1]

Turn over

15 Liz is thinking about the sequence of square numbers.

$1^2 = 1$ $2^2 = 4$ $3^2 = 9$ $4^2 = $ ....
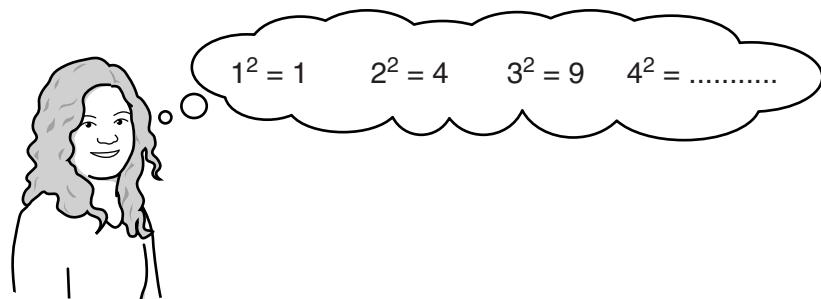
Liz thinks that 1 is the only square number that is also a cube number.

Is she correct?
Give reasons for your answer.

_____

_____

_____ **[3]**

END OF QUESTION PAPER