EDEXCEL GCSE METHODS IN MATHEMATICS

MATHS



EXAM QUESTION PACK

UNIT 1 FOUNDATION TIER 5MM1F PAPERS

STEMUP

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Centre Number | | | | | |

Candidate Number | | | | |

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Tuesday 13 June 2017 – Morning
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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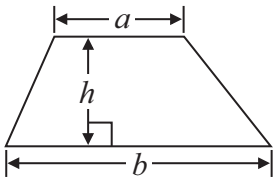
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GCSE Mathematics 2MM01

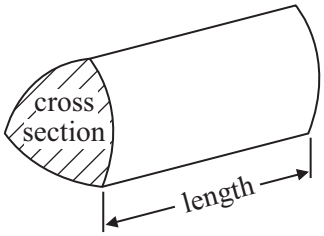
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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DO NOT WRITE IN THIS AREA

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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 (a) Write the number **two thousand and fifty nine** in figures.

.....

(1)

(b) Write the number 10 508 in words.

.....

(1)

(c) Write down the value of the **4** in the number 743

.....

(1)

(d) What is 2449 when rounded to the nearest hundred?

.....

(1)

(e) Write 0.0166 correct to **two** significant figures.

.....

(1)

(Total for Question 1 is 5 marks)

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

2 There are 10 counters in a bag.
5 of the counters are red.
5 of the counters are blue.

impossible	unlikely	evens	likely	certain

A counter is taken at random from the bag.

(a) Which word from the box best describes the likelihood that the counter will be either red or blue?

.....

(1)

(b) Which word from the box best describes the likelihood that the counter will **not** be red?

.....

(1)

(c) Which word from the box best describes the likelihood that the counter will be yellow?

.....

(1)

(Total for Question 2 is 3 marks)

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

3 (a) Work out 37 × 1000

.....

(1)

(b) Work out 196.4 ÷ 100

.....

(1)

(c) Work out 600 – 248

.....

(1)

Natasha thinks of two numbers.

One number is 5 more than the other number.
Natasha adds the two numbers and gets 31

(d) Find the two numbers.

..... and .....

(2)

(Total for Question 3 is 5 marks)

4 Write down the number that is halfway between

$$\frac{4}{5} \text{ and } 1.4$$

.....

(Total for Question 4 is 2 marks)

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5

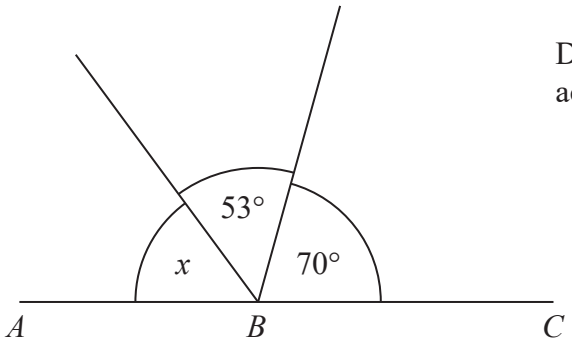


Diagram **NOT** accurately drawn

ABC is a straight line.

(i) Work out the size of the angle marked x.

$x =$ ..... °

(ii) Give a reason for your answer.

.....

.....

(Total for Question 5 is 3 marks)

6 (a) Simplify $4p - 3p + p$

.....

(1)

(b) Simplify $m \times m \times m \times m$

.....

(1)

(c) Simplify $x \times y \times 5$

.....

(1)

(d) Simplify fully $5c - 2d + c - 5d$

.....

(2)

(Total for Question 6 is 5 marks)

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7 Here is a sequence of patterns made from dots.



pattern number 1 pattern number 2 pattern number 3

(a) Draw pattern number 4

(1)

(b) (i) How many dots are there in pattern number 8?

.....

(ii) Explain how you found your answer.

.....

.....

(2)

A pattern in this sequence is made with exactly 35 dots.

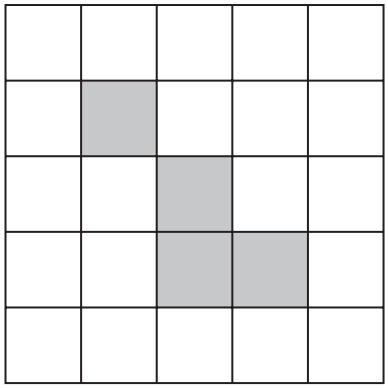
(c) Which pattern number is this?

pattern number .....

(2)

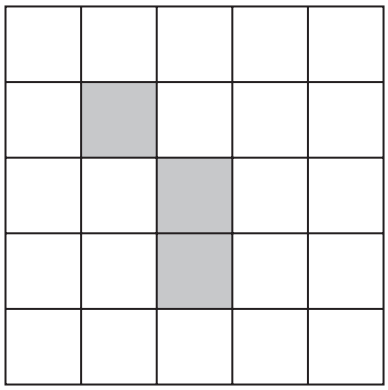
(Total for Question 7 is 5 marks)

8 (a) On the grid below, shade **one** more square to make a shape with one line of symmetry.



(1)

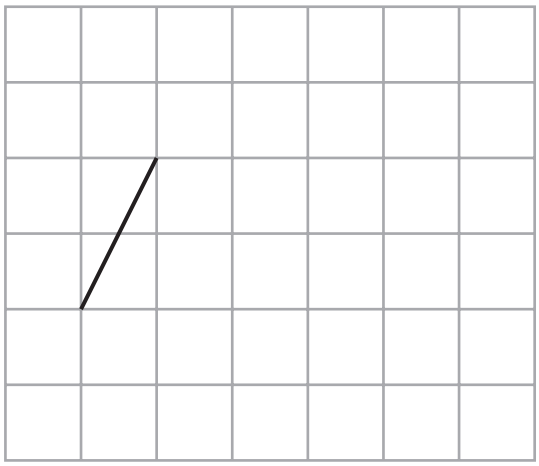
(b) On the grid below, shade **one** more square to make a shape with rotational symmetry of order 2



(1)

(c) On the grid below, draw a quadrilateral with **no** lines of symmetry **and** with rotational symmetry of order 2

One of the sides of the quadrilateral has been drawn for you.



(1)

(Total for Question 8 is 3 marks)

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***9** Here are three calculations.

The sum of 18 and 25	The difference between 100 and 59

The product of 6 and 7

Which of these calculations has the largest answer?
You must show how you get your answer.

(Total for Question 9 is 3 marks)

10 Dan is x years old.

Angela is 3 years younger than Dan.

(a) Write down an expression, in terms of x, for Angela's age.

.....

(1)

Olly is three times as old as Dan.

(b) Write down an expression, in terms of x, for Olly's age.

.....

(1)

(Total for Question 10 is 2 marks)

11 Here is a list of eight numbers.

24 25 26 27 28 29 30 32

From the list, write down

(i) two numbers that add up to 60

..... and .....

(ii) a factor of 72

.....

(iii) a multiple of 15

.....

(iv) a square number

.....

(Total for Question 11 is 4 marks)

12 (a) Solve $6x = 24$

$x =$ .....

(1)

(b) Solve $4c - 5 = 1$

$c =$ .....

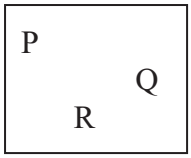
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(Total for Question 12 is 3 marks)

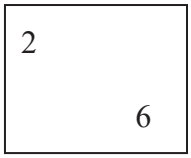
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13 A letter is taken from Box A and a number is taken from Box B.

Box A



Box B



Write down all the possible outcomes.

.....

.....

(Total for Question 13 is 2 marks)

14

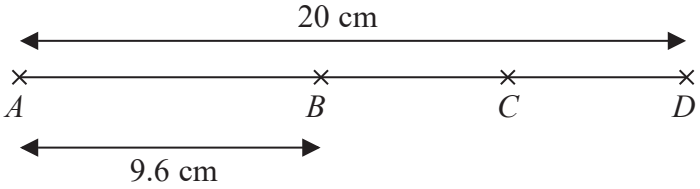


Diagram **NOT** accurately drawn

A, *B*, *C* and *D* are points on a straight line.
AD = 20 cm
AB = 9.6 cm
BC = *CD*

Work out the length of *BC*.

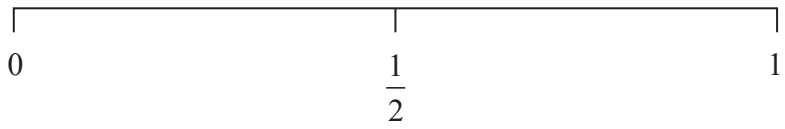
.....cm

(Total for Question 14 is 3 marks)

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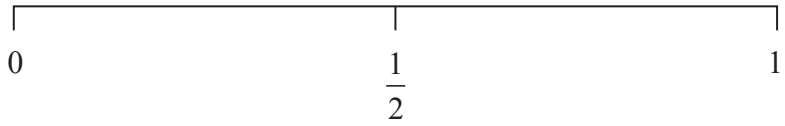
15 An ordinary fair dice is thrown once.

(a) On the probability scale below, mark with a cross (×) the probability that the dice will land on an odd number.



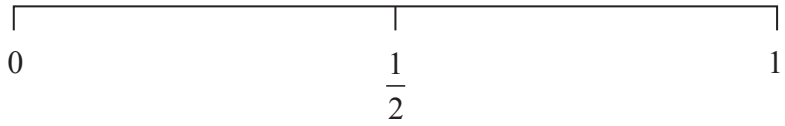
(1)

(b) On the probability scale below, mark with a cross (×) the probability that the dice will land on a number less than 7



(1)

(c) On the probability scale below, mark with a cross (×) the probability that the dice will land on 2

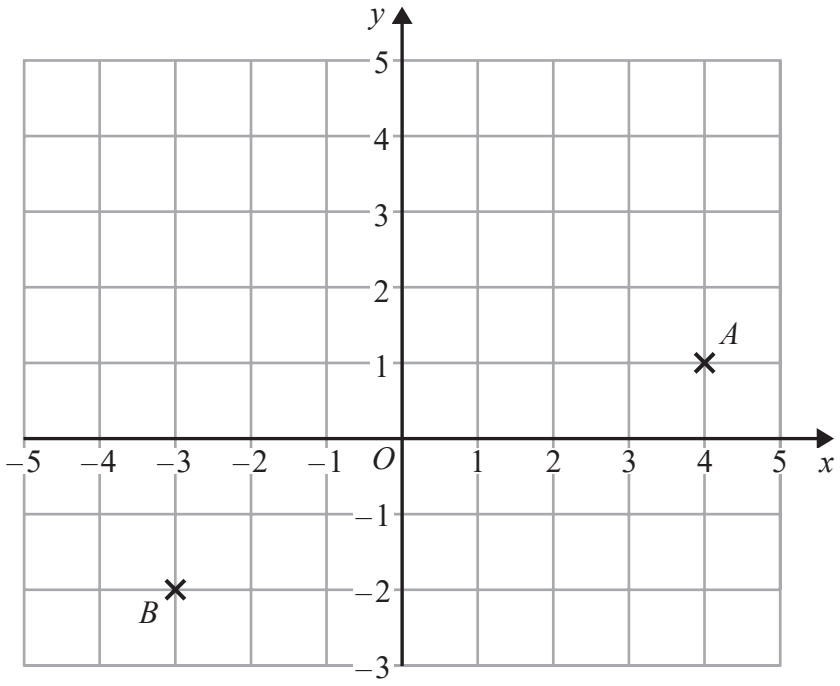


(1)

(Total for Question 15 is 3 marks)

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16



(a) (i) Write down the coordinates of the point A.

(.....,.....)

(ii) Write down the coordinates of the point B.

(.....,.....)

(2)

(b) On the grid, plot the point (−4, 0)
Label the point C.

(1)

D is another point on the grid.
The coordinates of the midpoint of AD are (1, 2)

(c) Find the coordinates of the point D.

(.....,.....)

(2)

(Total for Question 16 is 5 marks)

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17 Here is a 5 cm by 2 cm rectangle.

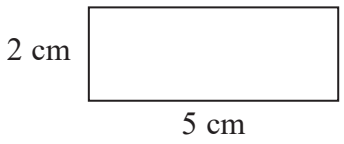
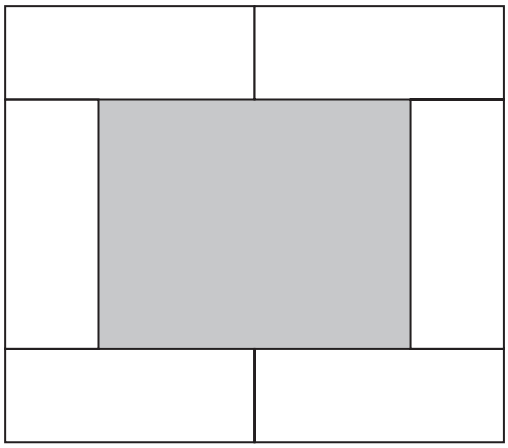


Diagram **NOT** accurately drawn

Six of these rectangles are used to make this pattern.



Work out the area of the shaded region.

.....cm^2

(Total for Question 17 is 3 marks)

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18 (a) Work out 285×34

.....

(3)

(b) Work out $3540 \div 15$

.....

(3)

(Total for Question 18 is 6 marks)

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***19** The diagram shows an isosceles triangle.

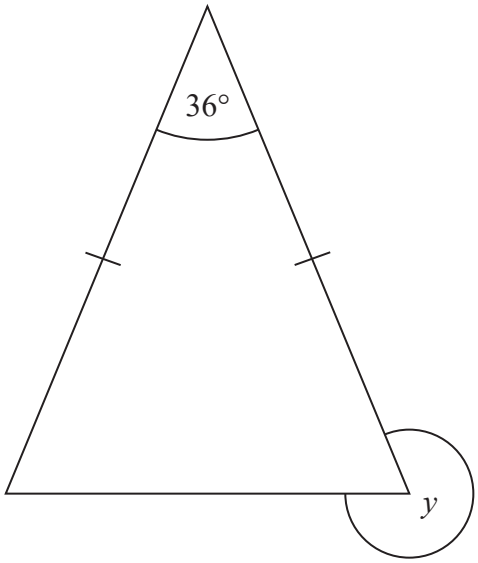


Diagram **NOT** accurately drawn

Work out the size of angle y.

Give reasons for each stage of your working.

(Total for Question 19 is 4 marks)

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20 (a) Write $\frac{8}{18}$ as a fraction in its simplest form.

.....

(1)

(b) Write $\frac{32}{9}$ as a mixed number.

.....

(1)

(c) Work out $\frac{5}{8} + \frac{1}{4}$

.....

(2)

*(d) Which of these fractions is the largest?

$\frac{9}{10}$ $\frac{4}{5}$ $\frac{37}{40}$

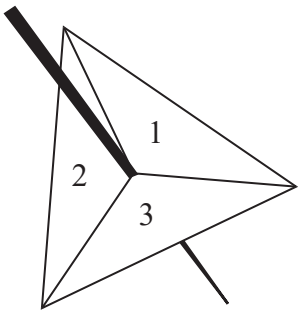
You must show clearly how you get your answer.

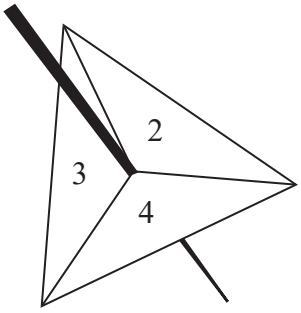
(3)

(Total for Question 20 is 7 marks)

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21 Michelle has two fair 3-sided spinners.





Michelle spins each spinner once.
Each spinner lands on a number.

Michelle multiplies these two numbers together to get her score.

(i) Work out the probability that Michelle's score is 4

.....

(ii) Work out the probability that Michelle's score is at least 8

.....

(Total for Question 21 is 5 marks)

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22

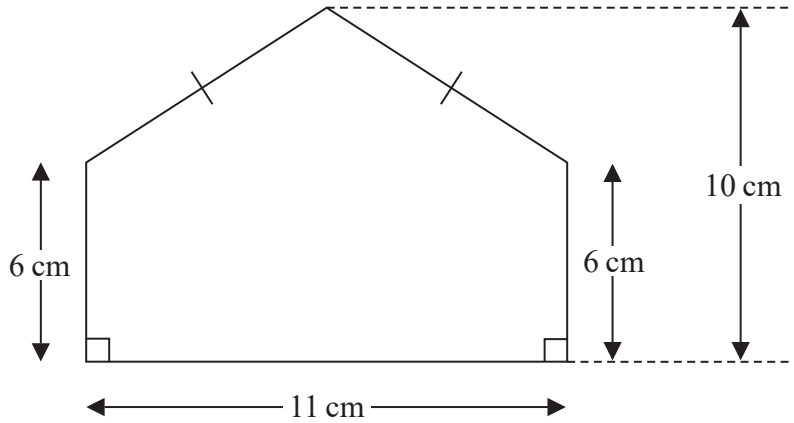


Diagram **NOT** accurately drawn

Work out the area of the shape.

.....

(Total for Question 22 is 5 marks)

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23 The probability that a biased coin will land on Heads is 0.43

Azmol is going to throw the coin 600 times.

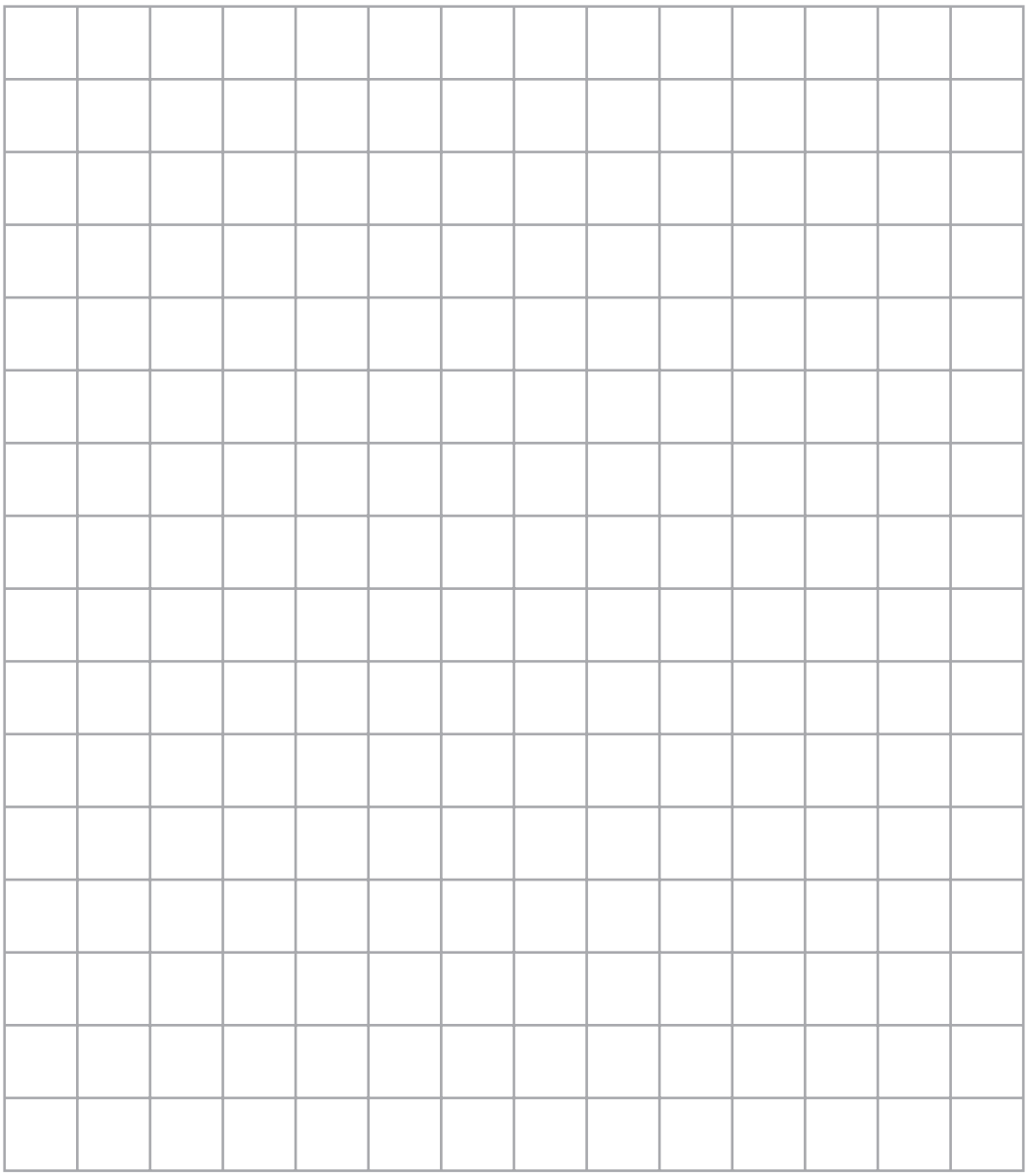
Work out an estimate for the number of times the coin will land on Tails.

.....

(Total for Question 23 is 3 marks)

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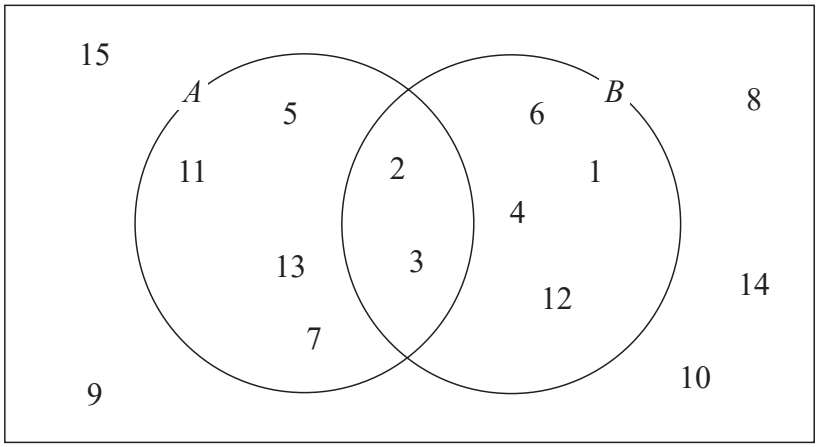
24 On the grid, draw the graph of $y = 3x + 2$ for values of x from -2 to 2



(Total for Question 24 is 4 marks)

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25 The Venn diagram shows the numbers from 1 to 15



cube	even	odd	prime	square

(a) Which one word from the box best describes the numbers in set A?

.....

(1)

(b) (i) Find P($A \cap B$)

.....

(ii) Find P(B')

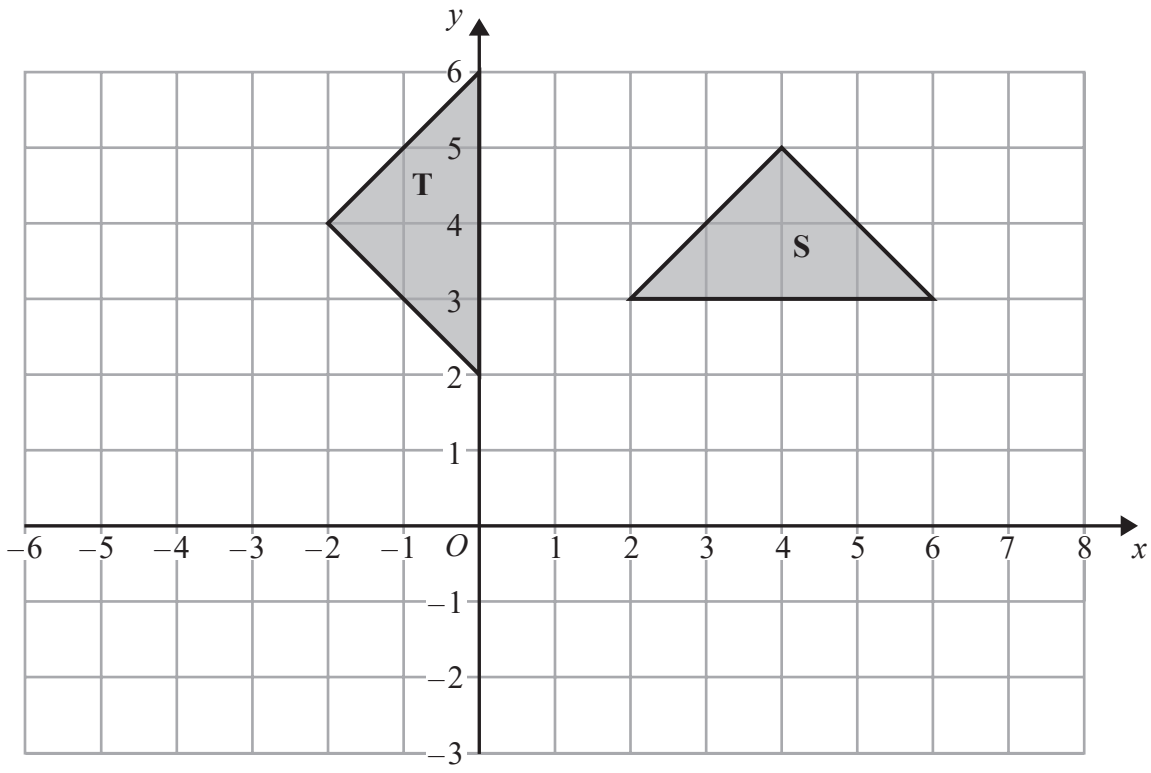
.....

(3)

(Total for Question 25 is 4 marks)

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26



Shape **S** can be transformed to shape **T** by the translation $\begin{pmatrix} 0 \\ -3 \end{pmatrix}$ followed by a rotation.

Describe the rotation.

.....

.....

(Total for Question 26 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

END

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Write your name here

Surname	Other names

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Centre Number | | | | | |

Candidate Number | | | | |

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Monday 10 November 2014 – Morning
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**



Information

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  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

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- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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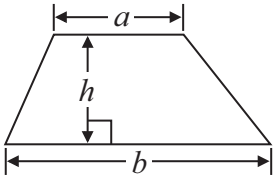
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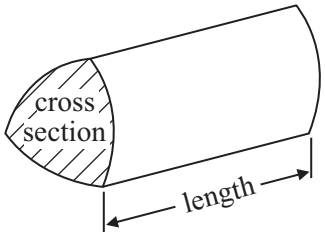
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 (a) Write the number 3 000 000 in words.

.....

(1)

(b) Write down the value of the 2 in 528

.....

(1)

(c) Work out the sum of one thousand and sixty and two hundred and fourteen.
Write your answer in figures.

.....

(2)

(d) Work out 30×40

.....

(1)

(e) Work out $81.4 \div 10$

.....

(1)

(Total for Question 1 is 6 marks)

2 There are 10 counters in a bag.
5 of the counters are red.
5 of the counters are blue.

impossible	unlikely	even	likely	certain

A counter is taken at random from the bag.

(a) Which word from the box best describes the probability that the counter will be white?

.....

(1)

(b) Which word from the box best describes the probability that the counter will be blue?

.....

(1)

(Total for Question 2 is 2 marks)

3 (a) Simplify $m + m + m + m$

.....

(1)

(b) Simplify $5a - 2a$

.....

(1)

(c) Simplify $x \times y \times 4$

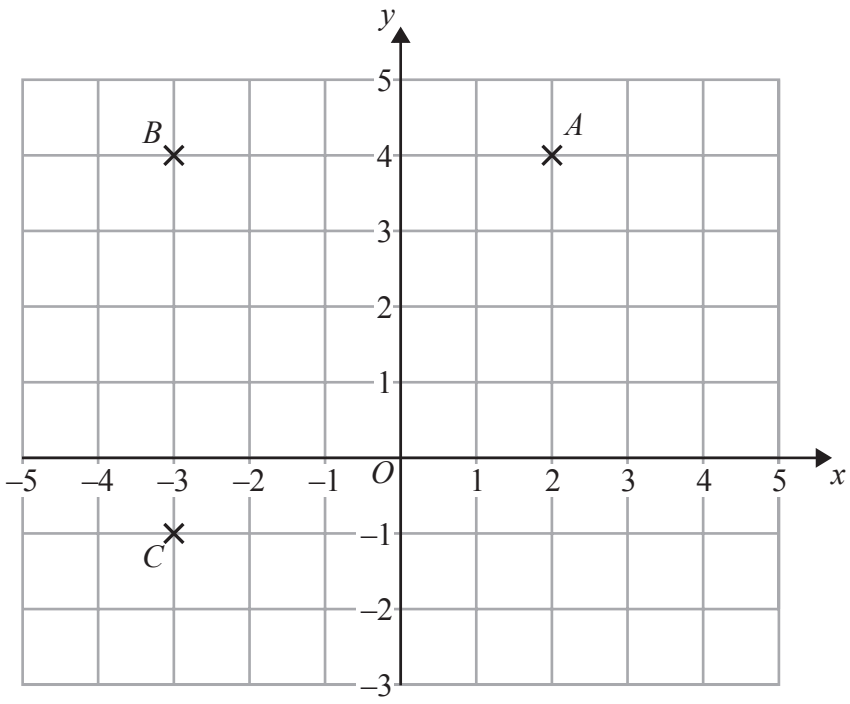
.....

(1)

(Total for Question 3 is 3 marks)

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4



(a) Write down the coordinates of the point

(i) A

(.....,.....)

(ii) C

(.....,.....)

(2)

$ABCD$ is a square.

(b) On the grid, mark with a cross (×) the point D so that $ABCD$ is a square.

(1)

(Total for Question 4 is 3 marks)

5 (a) Write the number 456 correct to the nearest hundred.

.....

(1)

(b) Work out 500 – 152

.....

(2)

(c) Work out 5 + 3.76 + 1.8

.....

(2)

(d) Work out an estimate for the value of 19 × 10.2

.....

(2)

(e) Write the number 5.84 correct to 1 decimal place.

.....

(1)

(Total for Question 5 is 8 marks)

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6 x, y and z are 3 angles.

The size of angle x is 50°.

angle y = angle x + 90°

(a) What type of angle is angle y?

.....

(1)

angle z = 4 × angle x

(b) What type of angle is angle z?

.....

(2)

(Total for Question 6 is 3 marks)

7

5	21	39
11	15	8
38	9	72

From the numbers in the box, write down

(a) an even number,

.....

(1)

(b) a square number,

.....

(1)

(c) a prime number.

.....

(1)

(Total for Question 7 is 3 marks)

8 Here is a sequence of patterns made from dots.



pattern number 1 pattern number 2 pattern number 3

(a) Draw pattern number 4

(1)

(b) (i) How many dots are in pattern number 9?

.....

(ii) Explain how you found your answer.

.....

.....

(2)

A pattern in this sequence is made with exactly 29 dots.

(c) Which pattern number is this?

pattern number .....

(2)

(Total for Question 8 is 5 marks)

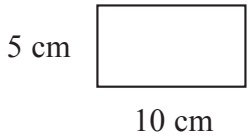
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9 A square has sides of length 5 cm.



Diagrams **NOT** accurately drawn

A rectangle is 10 cm by 5 cm.



Here is a larger rectangle made from some of these squares and some of these rectangles.

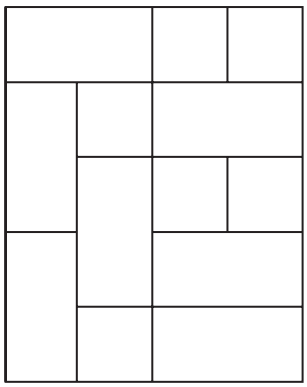


Diagram **NOT** accurately drawn

Work out the area of this larger rectangle.

.....

(Total for Question 9 is 4 marks)

10

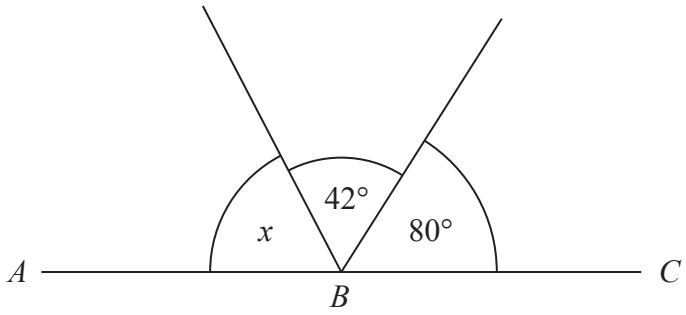


Diagram **NOT** accurately drawn

ABC is a straight line.

(i) Work out the size of the angle marked *x*.

$x =$ ..... °

(ii) Give a reason for your answer.

.....

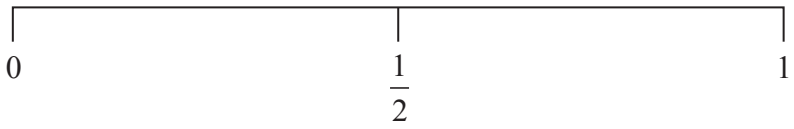
.....

(Total for Question 10 is 3 marks)

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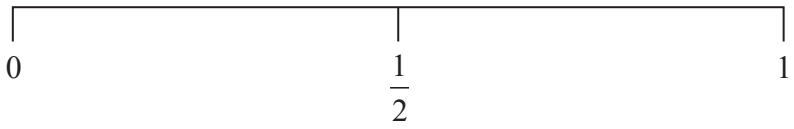
11 An ordinary fair dice is thrown once.

(a) On the probability scale below, mark with a cross (×) the probability that the dice will land on a number less than 7



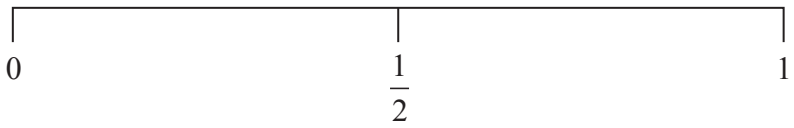
(1)

(b) On the probability scale below, mark with a cross (×) the probability that the dice will land on an even number.



(1)

(c) On the probability scale below, mark with a cross (×) the probability that the dice will land on 5



(1)

(Total for Question 11 is 3 marks)

***12** Here are two fractions.

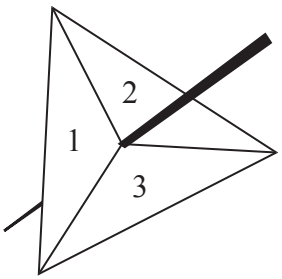
$$\frac{1}{6} \quad \text{and} \quad \frac{2}{9}$$

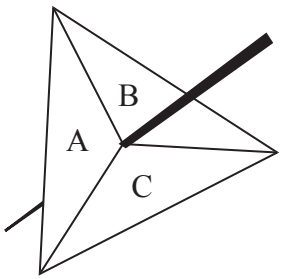
Which is the smaller fraction?

You must show clearly how you get your answer.

(Total for Question 12 is 3 marks)

13 Here are two 3-sided spinners.





Lottie spins each spinner once.

Write down all the possible outcomes she can get.

(Total for Question 13 is 2 marks)

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14 (a) Write these numbers in order of size.

Start with the smallest number.

-3 2 0 -1

.....

(1)

(b) Work out $-3 + 5$

.....

(1)

(c) Work out $1 + 2 \times 3$

.....

(1)

(d) Put in brackets to make the following calculation correct.

$$2 \times 3 + 8 - 4 = 18$$

(1)

(e) Work out $5^2 - 2^3$

.....

(2)

(Total for Question 14 is 6 marks)

---

15 Here are the first four terms of a number sequence.

3 8 13 18

Here are the first four terms of a different number sequence.

4 7 10 13

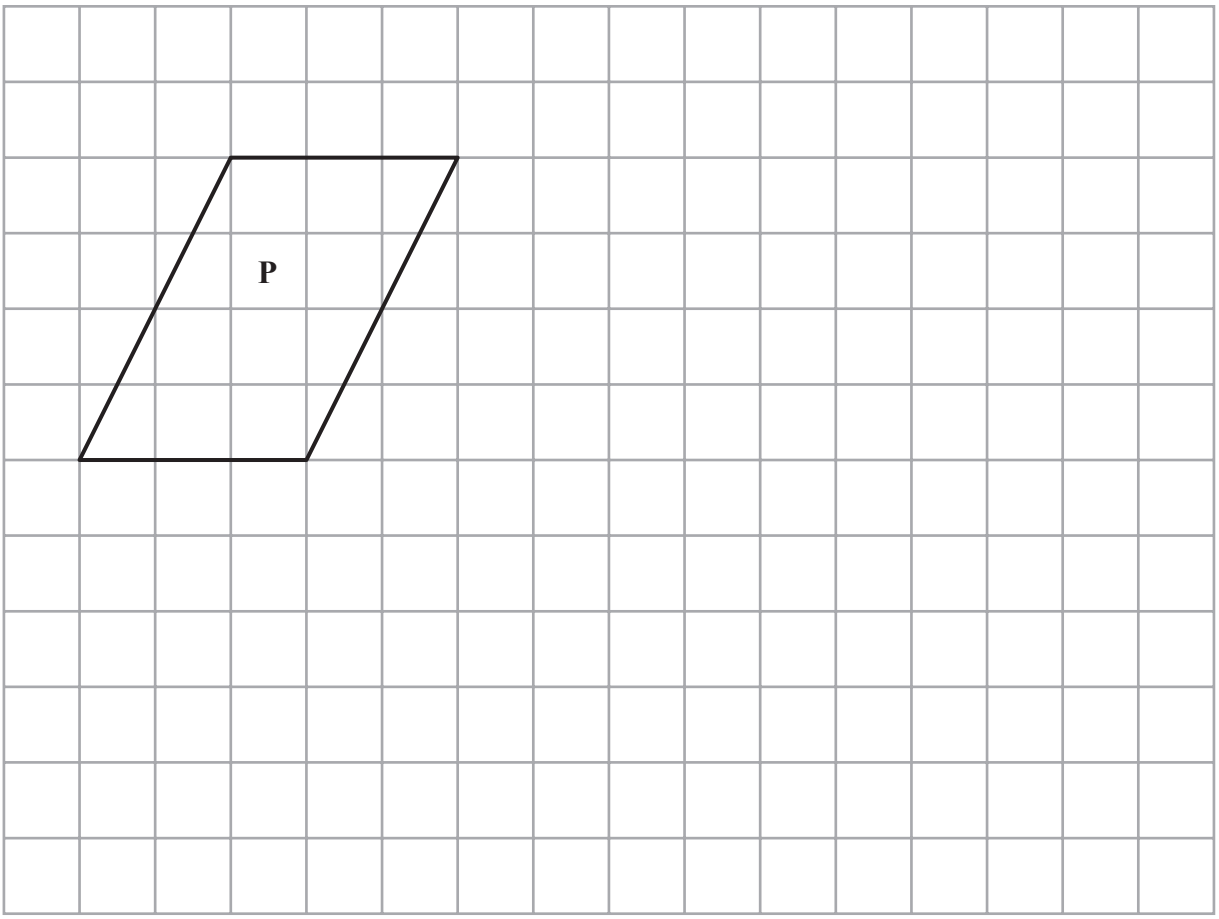
The number 13 is in both number sequences.

What is the next number that is in both number sequences?

.....

(Total for Question 15 is 2 marks)

16



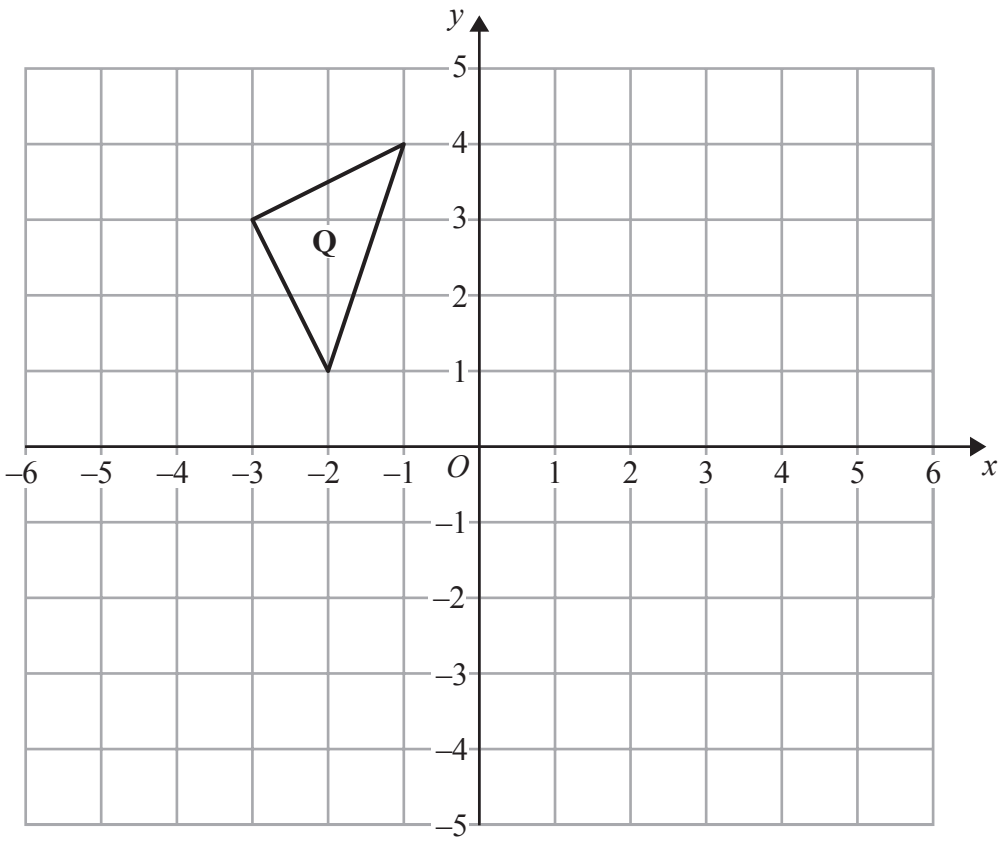
(a) (i) Write down the order of rotational symmetry of shape **P**.

.....

(ii) On the grid above, draw an enlargement of shape **P** with a scale factor of 2

(3)

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(b) On the grid, reflect triangle **Q** in the y-axis.

(1)

(Total for Question 16 is 4 marks)

17 (a) Solve $6p = 30$

.....

(1)

(b) Solve $12 + t = 19$

.....

(1)

(c) Solve $4x - 7 = 3$

.....

(2)

(Total for Question 17 is 4 marks)

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18 There are 24 marbles in a bag.

8 of the marbles are gold.
6 of the marbles are silver.
The rest of the marbles are bronze.

One marble is to be taken at random from the bag.

(a) What is the probability that this marble will be silver?
Give your answer as a fraction in its simplest form.

.....

(2)

(b) What is the probability that this marble will be bronze?

.....

(2)

(c) What is the probability that this marble will **not** be gold?

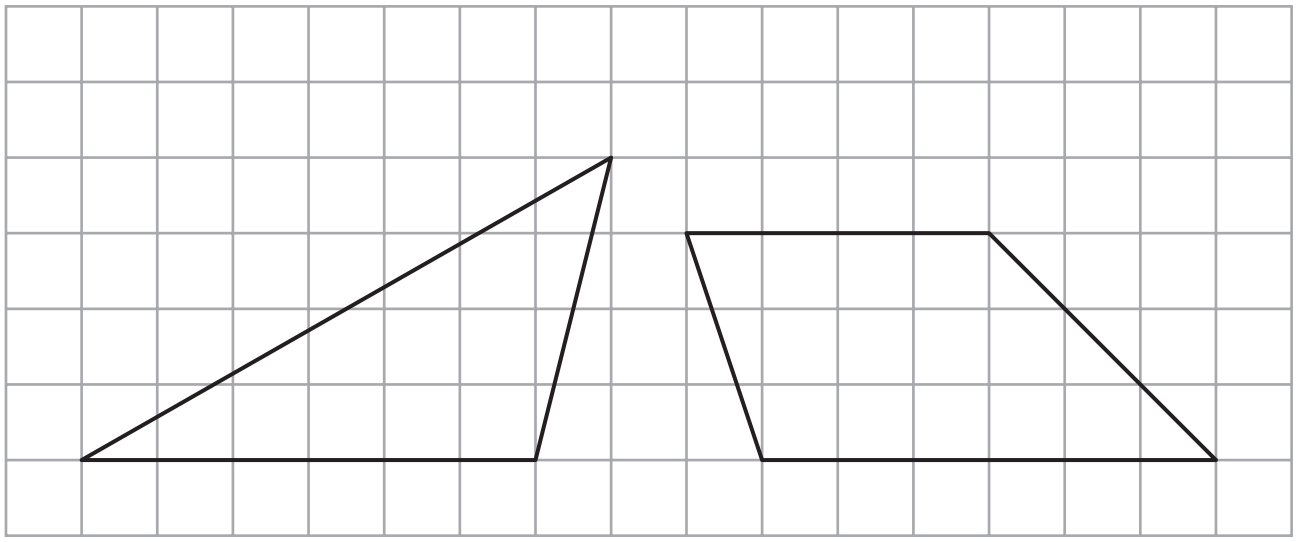
.....

(1)

(Total for Question 18 is 5 marks)

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***19** The diagram shows two shapes on a grid of centimetre squares.



Compare the areas of these two shapes.

(Total for Question 19 is 4 marks)

***20**

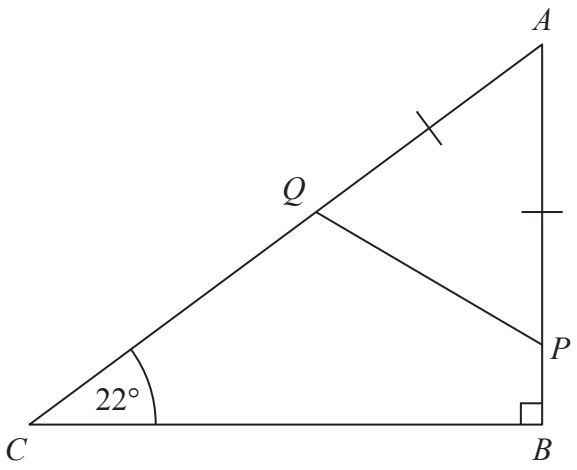


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.
Angle *B* = 90°
Angle *ACB* = 22°

P is a point on *AB*.
Q is a point on *AC*.
AP = *AQ*.

Work out the size of angle *APQ*.
Give reasons for each stage of your working.

(Total for Question 20 is 5 marks)

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21 (a) Find two factors of 36 with a difference of 5

..... and .....

(2)

The Lowest Common Multiple (LCM) of three numbers is 30
Two of the numbers are 2 and 5

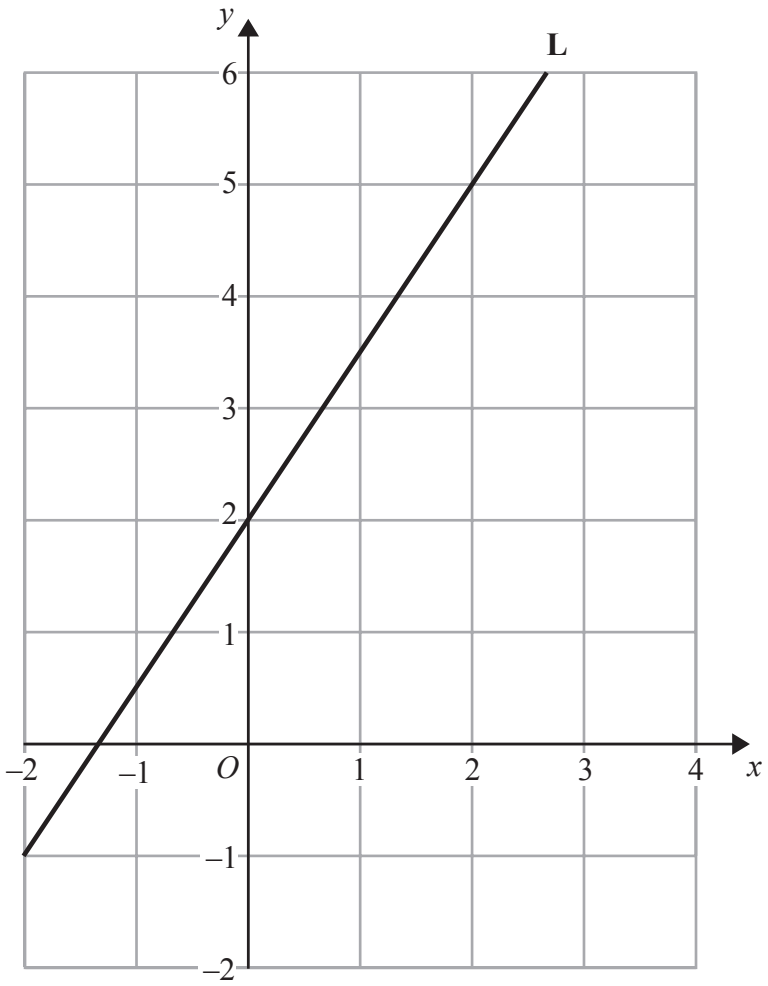
(b) What could be the third number?

.....

(2)

(Total for Question 21 is 4 marks)

***22** The diagram shows a straight line **L** drawn on a grid.



$y = 2x - 1$ is the equation of a different straight line.

Which straight line has the greater gradient?
Show how you get your answer.

(Total for Question 22 is 4 marks)

23 There are 50 counters in a bag.

The counters are blue or yellow or black or white.
A counter is taken at random from the bag.

The table shows each of the probabilities that the counter will be blue or black or white.

Colour	blue	yellow	black	white
Probability	0.4		0.3	0.16

Work out the number of yellow counters in the bag.

.....

(Total for Question 23 is 4 marks)

24 There are 30 children in a class.

21 of the children sing in the choir.
10 of the children play in the band.
6 of the children sing in the choir **and** play in the band.

(a) Draw a Venn diagram to show this information.

(4)

One of the children from the class is chosen at random.

(b) Work out the probability that this child plays in the band, but does **not** sing in the choir.

.....

(2)

(Total for Question 24 is 6 marks)

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***25** *PQRS* is a square.

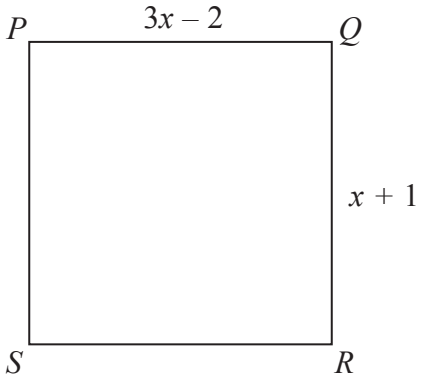


Diagram **NOT** accurately drawn

All measurements are in centimetres.

Show that the perimeter of the square is 10 cm.

(Total for Question 25 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

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Mark Scheme (Results)

November 2014

Pearson Edexcel GCSE
Linked Pair Pilot in Mathematics
Methods in Mathematics
Foundation: (Non-Calculator) Unit 1

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Note that in some cases a correct answer alone will not score marks unless supported by working; these situations are made clear in the mark scheme. Examiners should be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will award marks for the quality of written communication (QWC).
The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labelling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Partial answers shown (usually indicated in the ms by brackets) can be awarded the method mark associated with it (implied).
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks; transcription errors may also gain some credit. Send any such responses to review for the Team Leader to consider.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect cancelling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

14 The detailed notes in the mark scheme, and in practice/training material for examiners, should be taken as precedents over the above notes.

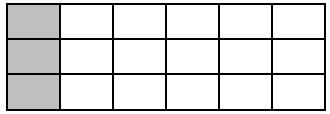
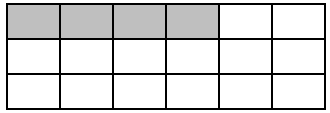
Guidance on the use of codes within this mark scheme
M1 – method mark for appropriate method in the context of the question A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		three million	1	B1 for three million (accept 3 million or 3 thousand thousand)
	(b)		2 tens or 20	1	B1 for 2 tens or 20 or twenty
	(c)		1274	2	M1 for 1060 + 214 or 1000 + 60 + 200 + 14 A1 for 1274
	(d)		1200	1	B1 cao
	(e)		8.14	1	B1 cao
2	(a)		impossible	1	B1 cao
	(b)		even	1	B1 cao
3	(a)		$4m$	1	B1
	(b)		$3a$	1	B1
	(c)		$4xy$	1	B1
4	(a)(i)		(2, 4)	2	B1 cao
	(ii)		(-3, -1)		B1 cao
	(b)		× at (2, -1)	1	B1 for × at (2, -1)

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)		500	1	B1 cao
	(b)		348	2	M1 for a complete method to subtract 152 from 500 or 8 seen in the units column of a calculation or the answer A1 cao
	(c)		10.56	2	M1 for setting out the addition with digits in the correct columns oe A1 cao
	(d)		200 (or 190)	2	M1 for 20 or 10 A1 for 200 or 190
	(e)		5.8	1	B1 cao
6	(a)		obtuse	1	B1 for obtuse.
	(b)		reflex	2	M1 for 4 × 50 (= 200) A1 for reflex or ft “200”

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
7	(a)		8 or 38 or 72	1	B1 for 8 or 38 or 72
	(b)		9	1	B1 cao
	(c)		5 or 11	1	B1 for 5 or 11
8	(a)		● ● ● ● ● ● ● ● ●	1	B1 cao
	(b)(i)		19	2	B1 cao
	(ii)		Add 2 each time or 2 × 9 + 1		B1 for ‘add 2’ oe or 2 × 9 + 1 oe
	(c)		14	2	M1 for (29 – 1) ÷ 2 or for listing terms to include 29 A1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
9			500 cm^2	4	M1 for method to find the area of the square or rectangle or either dimension of the large rectangle. M1 for a complete method to find the total area of the large rectangle A1 cao B1 (indep) for units of cm^2 Note: Areas may be just shown on diagrams
10	(i)		58^o	3	M1 for 180 – 42 – 80 A1 for $x = 58^o$ (this may be just seen on the diagram in the correct place)
	(ii)		the sum of the angles on a straight line is 180^o		B1 for the sum of the angles on a straight line is 180^o

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		× at 1	1	B1 cao
	(b)		× at $\frac{1}{2}$	1	B1 cao
	(c)		× at $\frac{1}{6}$	1	B1
*12		$\frac{1}{6} = \frac{3}{18}$, $\frac{2}{9} = \frac{4}{18}$ OR   OR $\frac{1}{6}$ of 100 = 100 ÷ 6 = 16.6 …. $\frac{2}{9}$ of 100 = 200 ÷ 9 = 22.2 ….	$\frac{1}{6}$	3	M1 for an attempt to convert both fractions to fractions with a common denominator, with at least one correct; 18, 36, etc. A1 for both equivalent fractions being correct C1 (dep on M1) for $\frac{1}{6}$ is the smaller fraction, oe OR M1 for diagrams of the same size, 18,36, etc. squares with correct shading on at least one of them A1 for both diagrams being correct C1 (dep on M1) for $\frac{1}{6}$ is the smaller fraction, oe OR M1 for $\frac{1}{6}$ and $\frac{2}{9}$ of a quantity A1 for Two correct answers for their chosen quantity. C1 (dep on M1) for $\frac{1}{6}$ is the smaller fraction, oe

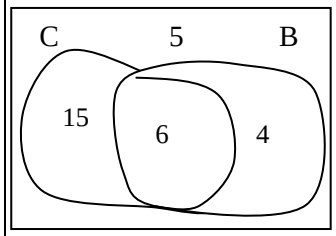
PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
13			A 1,B 1,C 1,A 2,B 2, C 2,A 3,B 3,C 3	2	M1 for at least 3 correct pairs A1 for all 9 correct pairs (no repeats and no extras)
14	(a)		-3 -1 0 2	1	B1 cao
	(b)		2	1	B1 cao
	(c)		7	1	B1 cao
	(d)		2×(3+8) –4 = 18	1	B1 for one pair of brackets around 3+8. Ignore further brackets drawn if the calculation is still correct
	(e)		17	2	M1 for $5^2 = 25$ or $2^3 = 8$ A1 for 17
15		3 8 13 18 23 28 33 38 4 7 10 13 16 19 22 25 28	28	2	M1 for correctly finding the next term (23 or 16) in either sequence A1 for 28

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)(i)		2	3	B1 cao
	(ii)		Correct shape drawn		M1 for one side enlarged correctly A1 for a fully correct enlargement
	(b)		Triangle with vertices (1,4), (3,3) and (2,1)	1	B1 for triangle with vertices (1,4), (3,3) and (2,1)
17	(a)		5	1	B1 cao
	(b)		7	1	B1 cao
	(c)		2.5	2	M1 for a clear intention to add 7 to both sides or divide all terms by 4 A1 for 2.5 oe
18	(a)		$\frac{1}{4}$	2	M1 for $\frac{6}{24}$ oe, for example 25% or 0.25 A1 for $\frac{1}{4}$ cao
	(b)		$\frac{10}{24}$	2	M1 for 24 – 8 – 6 (=10) or $1 - '\frac{6}{24}' - \frac{8}{24}$ A1 for $\frac{10}{24}$ oe
	(c)		$\frac{16}{24}$	1	B1 for $\frac{16}{24}$ oe or ft $\frac{'10'}{24} + \frac{6}{24}$

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*19			The area of the trapezium is greater than the area of the triangle	4	M1 for a complete method to find the area of the triangle M1 for a complete method to find the area of the trapezium A1 for 12 and 15 C1 ft (dep on M1) for comparison of their figures eg the area of the trapezium is greater or the difference is 3 OR M1 for the complete method of the area of the triangle or trapezium M1 for superimposing the area of the triangle on to the trapezium or the area of the trapezium on to the area of the triangle A1 for a difference of 3 C1 ft (dep on M1) for comparison of their figures eg the area of the trapezium is greater or the difference is 3

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*20			Angle *APQ* = 56	5	M1 for 180 – 90 – 22 (= 68) M1 (180 – '68') ÷ 2 (= 56) A1 for angle *APQ* = 56 C2 (dep on M2) for 'sum of the angles in a triangle is 180^{o}' oe and 'base angles of an isosceles triangle are equal' oe (C1(dep on M1) for one correct reason in the correct context) OR M1 for 360 – 22 – 90 (= 248) M1 for (360 – '248')÷2 (=56) A1 for angle *APQ* = 56 C2 (dep on M2) for 'sum of the angles in an quadrilateral is 360^{o}' and 'base angles of an isosceles triangle are equal' and 'sum of the angles on a straight line is 180^{o}' oe (C1 (dep on M1) for one correct reason in the correct context)
21	(a)	1, 2, 3, 4, 6, 9, 12, 18, 36	4 and 9 or 1 and 6	2	M1 for listing at least 2 factors of 36 A1 for 4 and 9 or 1 and 6
	(b)		3 or 6 or 15 or 30	2	M1 for 30÷2 or 30÷5 or 30 ÷ (2 × 5) or for any factors of 30 other than 2 or 5 A1 for 3 or 6 or 15 or 30

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*22			$y = 2x - 1$ has the greater gradient	4	M1 for plotting at least 2 unambiguous correct points satisfying $y = 2x - 1$; ignore any incorrect points M1 for correct points plotted with no incorrect points A1 for a single straight line segment of $y = 2x - 1$ C1 (dep on M1) for "$y = 2x - 1$ has the greater gradient" or ft their single line **(Alternative method)** M1 for a correct method to find gradient of **L** A1 for gradient of 1.5 M1 for gradient of $y = 2x - 1$ is 2 C1 (dep on M1) for "$y = 2x - 1$ has the greater gradient" oe or ft their gradients [SC: B1 for a single line segment drawn of gradient 2 if M0 scored]

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
23			7	4	M1 for 1 – 0.4 – 0.3 – 0.16 or 100 – 40 – 30 – 16 A1 for 0.14 oe M1 for "0.14" × 50 oe A1 for 7 or ft "0.14" × 50 OR M1 for 0.4 × 50 (= 20) or 0.3 × 50 (= 15) or 0.16 × 50 (= 8) A1 for 20 and 15 and 8 M1 for 50 – "20" – "15" – "8" A1 for 7 or ft from "20", "1" or "8"
24	(a)			4	M1 for two intersecting circles with 6 labelled in the intersection M1 for 21 – 6 (=15) or 10 – 6 (=4) M1 for 30 – 15 – 6 – 4 (=5) A1 for a fully correct and labelled Venn diagram; condone a missing outer rectangle
	(b)		$\frac{4}{30}$	2	M1 (ft from (a)) for $\frac{"4"}{a}$, $a >$ "4" or $\frac{b}{30}$, $b < 30$ with $b \neq 0$ A1 for $\frac{4}{30}$ oe

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*25			Proof	4	M1 for setting up a correct equation in x, eg. $3x - 2 = x + 1$ M1 (dep) for a fully correct method to solve their equation or for $x = 1.5$ M1 (dep) for ("1.5" + 1) × 4 or (3 × "1.5" – 2) × 4 or (3 × "1.5" – 2) × 2 + ("1.5"- 1) × 2 C1 (dep on M3) for a completing the proof resulting in a perimeter of 10 OR M1 for setting up a correct equation in x, Eg. $2(3x - 2) + 2(x + 1) = 10$ M1 (dep) for a fully correct method to solve their equation or for $x = 1.5$ M1 (dep) for "1.5" + 1 and 3× "1.5" – 2 C1 (dep on M3) for a completing the proof resulting in a justification that the shape is a square

Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5º
Measurements of length: ±5 mm

PAPER: 5MM1F_01			
Question		**Modification**	**Notes**
3	(b)	MLP a changed to y	
	(c)	MLP x changed to e y changed to f	
4		Grid enlarged Crosses changed to black circles.	
6		MLP x changed to w	
8		First 3 patterns laid out vertically. Pattern number 4 is started and candidates asked to complete. (Pattern number 3 is repeated & labelled Pattern number 4)	
9		Shapes based on a 2 cm square.	
11		Probability scales extended.	

PAPER: 5MM1F_01			
Question		**Modification**	**Notes**
13		Spinners straightened up No spike just a black circle at the centre.	
16	(a) (b)	Enlarged grid Shape P moved down to 1 square up from the bottom. Enlarged grid	
19		Enlarged grid. Centimetre' removed from the 1st line. Wording added to question paper and diagram: 'Each square on the grid represents a one centimetre square'.	
25		MLP x changed to y	

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Surname	Other names

Pearson Edexcel GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Tuesday 17 June 2014 – Morning
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P43401A

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5/5/6/6/

P 4 3 4 0 1 A 0 1 2 8

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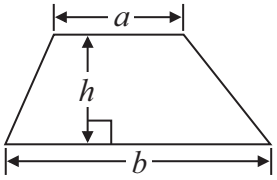
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GCSE Mathematics 2MM01

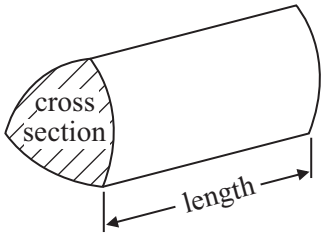
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 (a) Write the number **fifty two thousand and eighteen** in figures.

.....

(1)

(b) Write down the value of the **6** in the number 26 780

.....

(1)

(c) Write the number 6749 to the nearest hundred.

.....

(1)

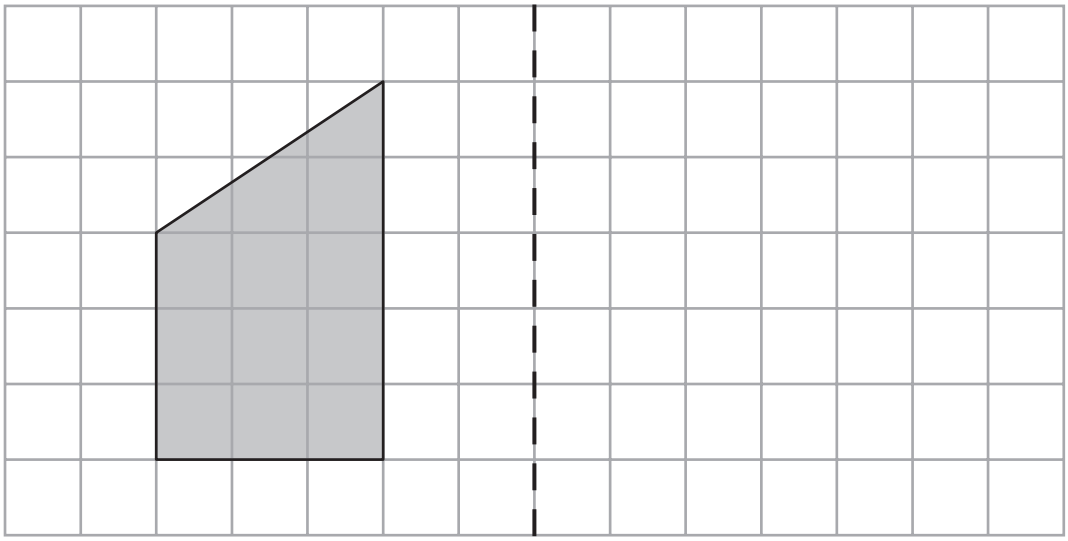
(d) Write 0.0763 correct to **one** significant figure.

.....

(1)

(Total for Question 1 is 4 marks)

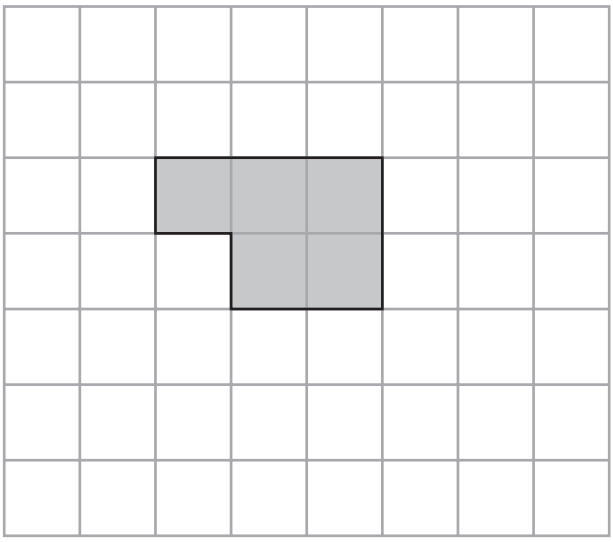
2 (a) Reflect the shaded shape in the mirror line.



mirror line

(2)

(b) On the grid below, shade **one** more square so that the shape has rotational symmetry of order 2



(1)

(Total for Question 2 is 3 marks)

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3 Here are the first four terms of a number sequence.

23 20 17 14

(i) Write down the next term of the sequence.

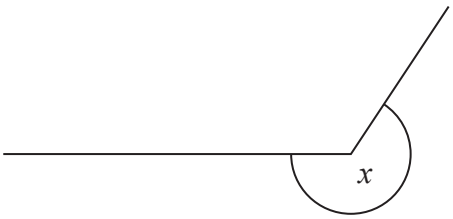
.....

(ii) Explain how you got your answer.

.....

(Total for Question 3 is 2 marks)

4



(a) Write down the mathematical name for the type of angle marked x.

.....

(1)

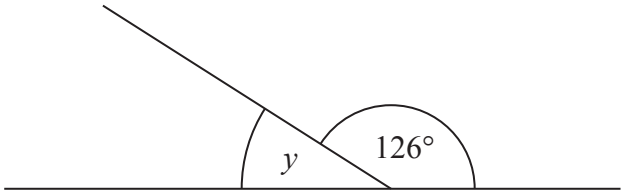


Diagram **NOT** accurately drawn

(b) (i) Work out the size of the angle marked y.

..... °

(ii) Give a reason for your answer.

.....

(2)

(c) Complete each statement correctly.

(i) The size of each angle of a rectangle is ..... °

(ii) The size of each angle of an equilateral triangle is ..... °

(2)

(Total for Question 4 is 5 marks)

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***5** Here are three fractions.

$$2\frac{2}{5} \qquad \frac{14}{5} \qquad \frac{52}{20}$$

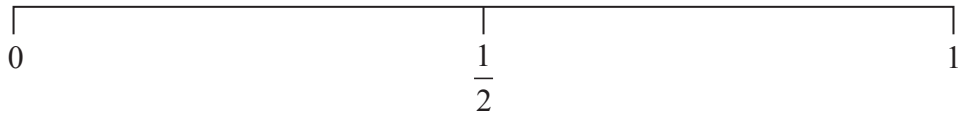
Which of these is the smallest fraction?

You must show how you get your answer.

(Total for Question 5 is 2 marks)

6 Tony throws a fair coin.

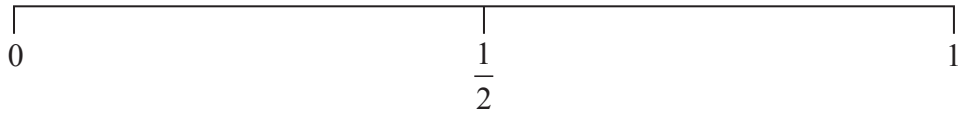
(a) On the probability scale, mark with a cross (×) the probability that the coin will land on tails.



(1)

Ali throws an ordinary 6-sided dice numbered from 1 to 6

(b) On the probability scale, mark with a cross (×) the probability that the dice will land on a number less than 7



(1)

There are 5 red beads, 2 blue beads and 4 yellow beads in a bag.

A bead is to be taken at random from the bag.

(c) (i) What colour of bead is **least** likely to be taken?

.....

(ii) What is the probability that the colour of the bead will be yellow?

.....

(3)

(Total for Question 6 is 5 marks)

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7 (a) Work out 56×1000

.....

(1)

(b) Work out $783.5 \div 100$

.....

(1)

(c) Work out $870 - 249$

.....

(1)

Ben thinks of two numbers.

Ben adds the two numbers and gets 25
One number is 3 more than the other number.

(d) Find the two numbers.

..... and .....

(2)

(Total for Question 7 is 5 marks)

8 A letter is taken from Box A and a number is taken from Box B.

Box A

M
E

Box B

2
4
7

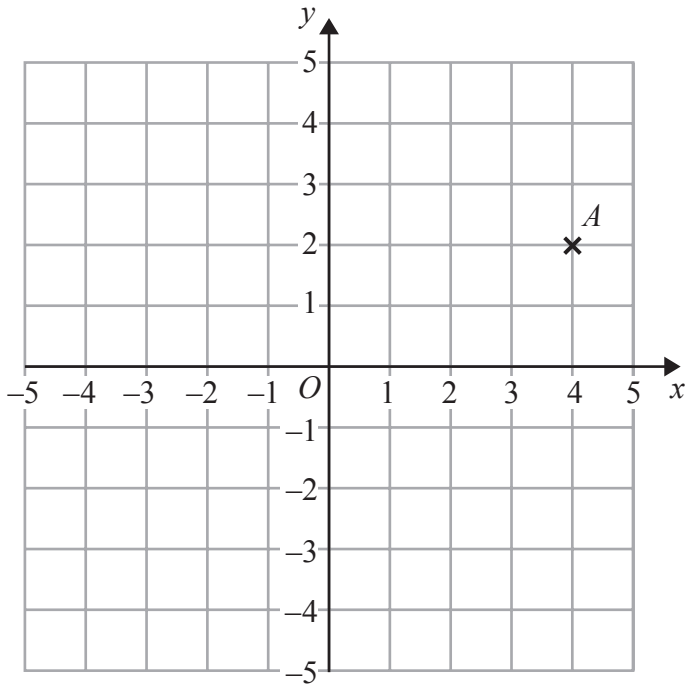
Show all the possible outcomes.

.....

.....

(Total for Question 8 is 2 marks)

9



(a) Write down the coordinates of point A.

(..... , ...)

(1)

(b) On the grid, mark with a cross (×) the point (−3, 0).
Label this point B.

(1)

(Total for Question 9 is 2 marks)

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10 (a) Write down an even number.

.....

(1)

(b) Write down a square number.

.....

(1)

(c) Write down a prime number between 30 and 40

.....

(1)

(d) Find all the factors of 40

.....

(2)

(Total for Question 10 is 5 marks)

11 (a) Write these numbers in order of size.
Start with the smallest number.

–7 3 –9 –4 0

.....

(1)

(b) Work out $-6 + 10$

.....

(1)

(c) Work out $7 - -3$

.....

(1)

(Total for Question 11 is 3 marks)

12

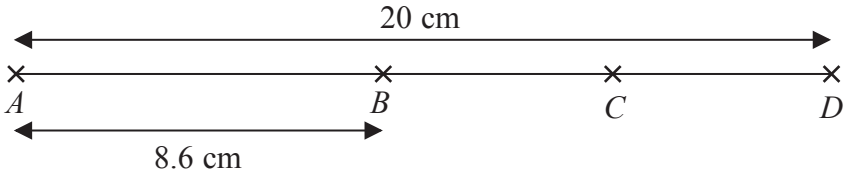


Diagram **NOT** accurately drawn

A, B, C and D are points on a straight line.
$AD = 20$ cm
$AB = 8.6$ cm
$BC = CD$

Work out the length of BC.

..... cm

(Total for Question 12 is 3 marks)

13 (a) Simplify $t + t + t$

.....

(1)

(b) Simplify $e \times 4 \times f$

.....

(1)

(c) Simplify $6m + 3k - 2m + 5k$

.....

(2)

(d) Simplify $y^4 \times y^3$

.....

(1)

(Total for Question 13 is 5 marks)

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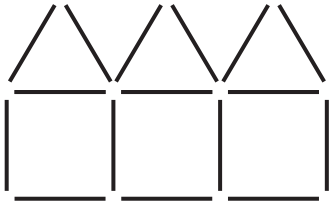
14 Here is a sequence of patterns made from sticks.



pattern number 1



pattern number 2



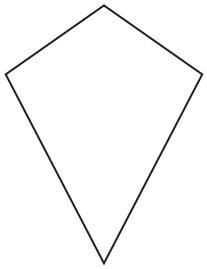
pattern number 3

Work out the number of sticks needed to make pattern number 10

.....

(Total for Question 14 is 3 marks)

15 (a) Here is a quadrilateral.



(i) Write down the mathematical name for this quadrilateral.

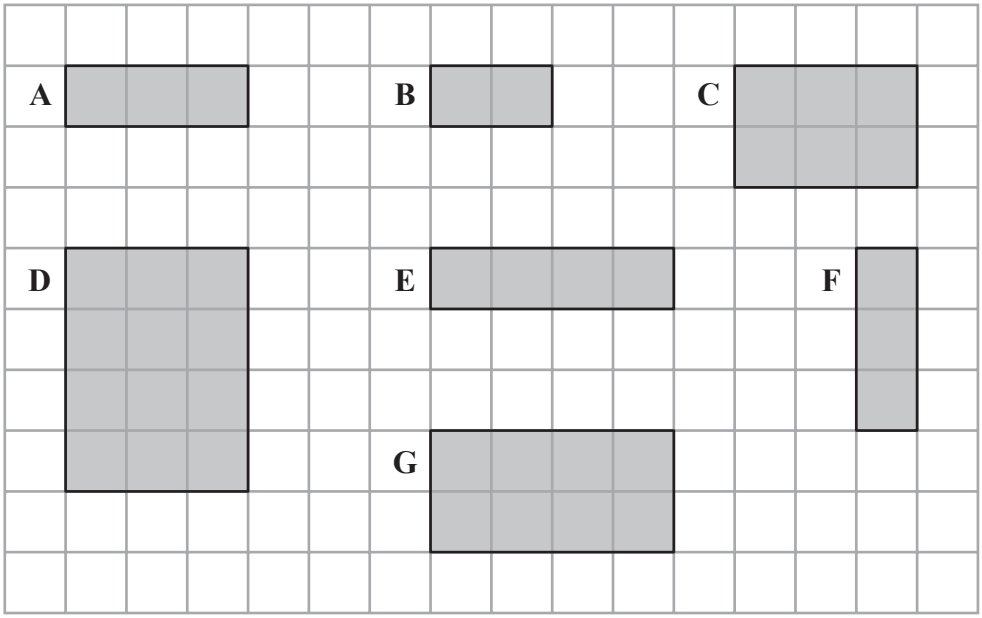
.....

(ii) How many lines of symmetry does this quadrilateral have?

.....

(2)

Here are 7 shaded rectangles drawn on a grid.



(b) One of the rectangles is congruent to rectangle **A**.

(i) Write down the letter of this rectangle.

.....

One of the rectangles is similar to rectangle **B**.

(ii) Write down the letter of this rectangle.

.....

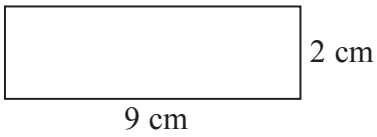
(2)

(Total for Question 15 is 4 marks)

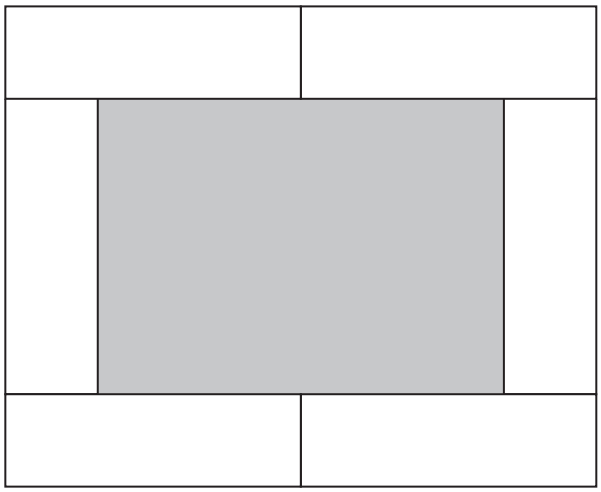
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16 Here is a 9 cm by 2 cm rectangle.

Diagram **NOT** accurately drawn



Six of these rectangles are used to make this pattern.



Work out the area that is shaded.

..... cm^2

(Total for Question 16 is 3 marks)

17 $p = 3a + 2b$

$a = 10$
$b = 4$

Work out the value of p.

.....

(Total for Question 17 is 2 marks)

18 There are 11 counters in a bag.
6 of these counters are green.
5 of these counters are red.

Some more red counters are put into the bag.

A counter is then taken at random from the bag.

The probability that the counter is red is $\frac{3}{5}$

How many red counters were put into the bag?

.....

(Total for Question 18 is 3 marks)

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***19** The diagram shows an isosceles triangle.

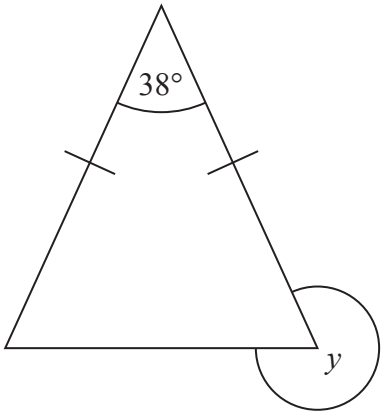


Diagram **NOT** accurately drawn

Work out the size of angle y.

Give reasons for your answer.

(Total for Question 19 is 4 marks)

20 (a) Solve $5e = 15$

.....

(1)

(b) Solve $f + 11 = 20$

.....

(1)

(c) Solve $3x - 4 = 17$

.....

(2)

(Total for Question 20 is 4 marks)

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21 (a) Work out 523×64

(3)

(b) Work out $5810 \div 14$

(3)

(Total for Question 21 is 6 marks)

***22** Which of these is the largest fraction?

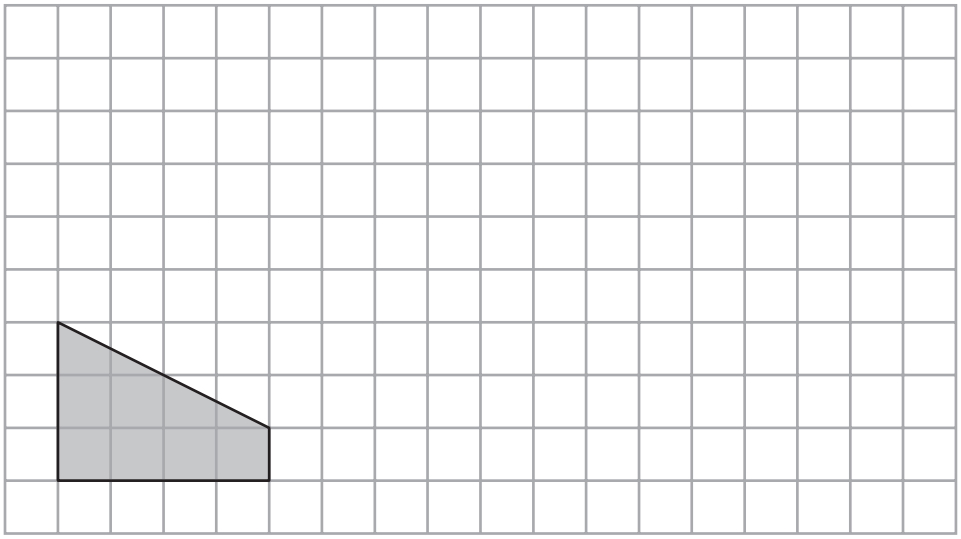
$$\frac{7}{10} \qquad \frac{3}{5} \qquad \frac{29}{40}$$

You must show clearly how you got your answer.

(Total for Question 22 is 3 marks)

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23 A shaded shape is shown on the grid.



On the grid, draw an enlargement of the shaded shape with scale factor 2

(Total for Question 23 is 2 marks)

***24** Here is a shape.

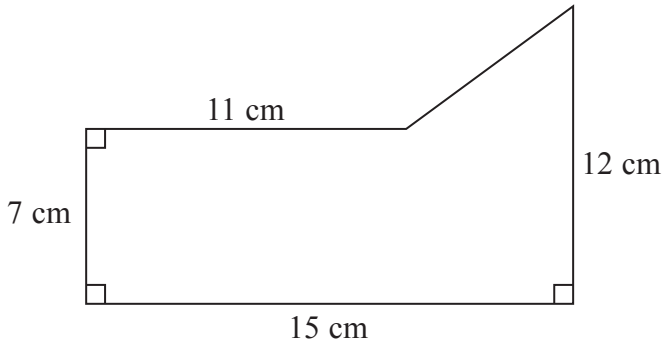


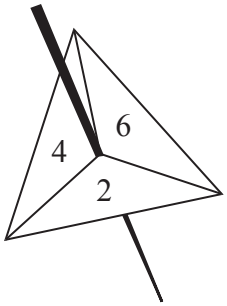
Diagram **NOT** accurately drawn

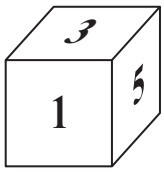
Work out the area of this shape.

(Total for Question 24 is 4 marks)

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25 Sue has a fair 3-sided spinner numbered 2, 4 and 6
She also has a fair 6-sided dice numbered 1, 2, 3, 4, 5 and 6





Sue spins the spinner once and rolls the dice once.
She adds the two numbers together to get the total score.

(i) Work out the probability that the total score will be 7

(ii) Work out the probability that the total score will be less than 6

(Total for Question 25 is 5 marks)

26 Here is a rectangle.

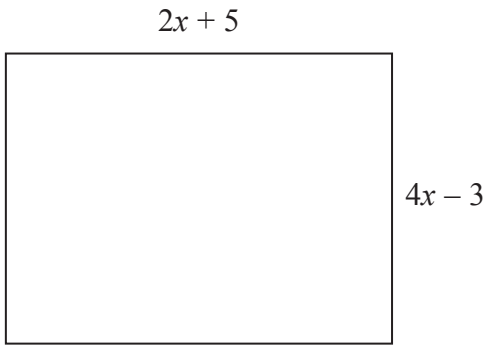


Diagram **NOT** accurately drawn

All the measurements are in centimetres.

The perimeter of the rectangle is 46 cm.

Work out the area of the rectangle.
You must show all your working.

..... cm^2

(Total for Question 26 is 5 marks)

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27 Here is some information about the students in Year 10

There are 60 students in Year 10
34 of the students study French.
25 of the students study German.
18 of the students study both French and German.

(a) Draw a suitable diagram for this information.

(4)

A teacher chooses at random one of the 60 students.

(b) Work out the probability that this student does **not** study French or German.

.....

(2)

(Total for Question 27 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

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Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE
Linked Pair Pilot in Mathematics
Methods in Mathematics (2MM01)
Foundation Paper 1F

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

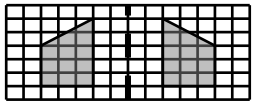
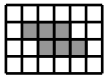
12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		52018	1	B1 cao
	(b)		Six thousand	1	B1 accept 6000
	(c)		6700	1	B1 cao
	(d)		0.08	1	B1 cao
2	(a)			2	B2 cao (B1 for any reflection in a vertical line or 3 vertices in correct position)
	(b)	 	Correct position	1	B1
3	(i)		11	2	B1 cao
	(ii)				B1 for an appropriate reason e.g. subtract 3 e.g. goes down by 3

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)		Reflex	1	B1
	(bi)		54	2	B1 cao
	(bii)		reason		B1 for Angles on a straight line add up to 180°
	(ci)		90	2	B1 cao
	(cii)		60		B1 cao
*5			$2\frac{2}{5}$	2	M1 for a method to convert all fractions to the same form e.g. improper fractions, mixed numbers, decimals, % with at least one correct C1 (dep on M1) for statement that $2\frac{2}{5}$ is the smallest oe with 3 correct conversions for comparison
6	(a)		Cross at $\frac{1}{2}$	1	B1 for cross at $\frac{1}{2}$
	(b)		Cross at 1	1	B1 for cross at 1
	(ci)		blue	3	B1 for blue
	(cii)		$\frac{4}{11}$		M1 for $\frac{a}{11}$ where $a < 11$ **or** $\frac{4}{b}$ where $b > 4$ A1 for $\frac{4}{11}$ oe

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
7	(a)		56000	1	B1 cao
	(b)		7.835	1	B1 cao
	(c)		621	1	B1 cao
	(d)		11 , 14	2	M1 for identifying a pair of numbers that sum to 25 or differ by 3 A1 cao **OR** M1 for $(25 - 3) \div 2$ (= 11) or $(25 + 3) \div 2$ (= 14) A1 cao **OR** M1 for $x + x + 3 = 25$ oe A1 cao

PAPER: 5MM1F_01

Question		Working	Answer	Mark	Notes
8		<table><tr><th></th><th>M</th><th>E</th></tr><tr><td>2</td><td>M,2</td><td>E,2</td></tr><tr><td>4</td><td>M,4</td><td>E,4</td></tr><tr><td>7</td><td>M,7</td><td>E,7</td></tr></table>	M2, M4, M7, E2, E4, E7	2	M1 for at least 4 correct combinations A1 for all 6 correct combinations (ignore repeats) **OR** M1 for possibility space with at least 4 combinations shown in table A1 for complete table
9	(a)		(4, 2)	1	B1 cao
	(b)		(−3, 0) plotted	1	B1 cao
10	(a)		example of an even number	1	B1 for any even number
	(b)		example of a square number	1	B1 for any square number
	(c)		31 or 37	1	B1 for 31 or 37 or 31 and 37
	(d)		1, 2, 4, 5, 8, 10, 20, 40	2	M1 for at least 4 factors of 40 (condone 1 error); may be seen in factor pairs A1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		$-9, -7, -4, 0, 3$	1	B1 cao
	(b)		4	1	B1 cao
	(c)		10	1	B1 cao
12			5.7	3	M1 for $20 - 8.6$ (=11.4) M1 for '11.4' ÷ 2 A1 cao **or** M1 for $2x + 8.6 = 20$ oe M1 for clear intention to subtract 8.6 from each side A1 cao
13	(a)		$3t$	1	B1
	(b)		$4ef$	1	B1
	(c)		$4m + 8k$	2	M1 for $4m$ **or** $8k$ A1
	(d)		y^7	1	B1 for y^7

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
14		6, 11, 16, ...	51	3	M1 for a correct pattern number (> 3) drawn M1 for pattern number 10 drawn A1 cao **OR** M1 for 6, 11, 16, (...) or + 5 seen M1 for continuing the sequence to at least the10th term (condone one arithmetic error) A1 cao **OR** M1 for $5n$ M1 for $5\times10 + 1$ oe or $5n + 1$ A1 cao
15	(ai)		Kite	2	B1 cao
	(aii)		1		B1 cao
	(bi)		F	2	B1 cao
	(bii)		G		B1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
16			126	3	M1 for a method to find the area of 1 rectangle e.g. 9 × 2 e.g. 18 × 13 (= 234) or for 7 + 7 (= 14) as the length of the shaded rectangle M1 for a complete method e.g. 14 × 9 A1 cao
17		3 × 10 + 2 × 4	38	2	M1 for 3 × 10 (= 30) or 2 × 4 **(** = 8) A1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
18			4	3	M1 for any fraction equivalent to $\frac{3}{5}$ e.g. $\frac{9}{15}$ M1 for calculation to work out number of additional counters e.g. '15' − 6 – 5 A1 cao **OR** M1 for $\frac{5}{11}$ or 6 : 5 M1 for $\frac{5+n}{11+n}$ $\frac{5+n}{11+n}$or 6 : 5 + *n*, where n is a number A1 cao **OR** M1 for $\frac{5+x}{6+5+x}=\frac{3}{5}$ M1 for correct method to solve equation as far as isolating terms in *x* A1 cao **OR** M1 for p(green) = $\frac{2}{5}=\frac{6}{n}$ M1 for (*n* =) 5 × (6 ÷ 2) (=15) A1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*19			289	4	M1 for (180 − 38) ÷2 (= 71) M1 (dep) for 360 − '71' or 180 + '71' + 38 A1 cao C1 for stating reasons appropriate to their method shown e.g. Angles in a triangle add up to 180^o Base angles in an isosceles triangle are equal Angles at a point add up to 360^o
20	(a)		3	1	B1 cao
	(b)		9	1	B1 cao
	(c)	$3x - 4 = 17$ $3x = 21$	7	2	M1 for clear intention to add 4 to each side **or** divide all terms by 3 in an equation A1 cao

PAPER: 5MM1F_01

Question		Working	Answer	Mark	Notes
21	(a)	523 64 × 2092 31380 33472 × | 500 | 20 | 3 60 | 30000 | 1200 | 180 4 | 2000 | 80 | 12 30000 + 1200 + 180 + 2000 + 80 + 12 = 33472 5 2 3 3 | 30 | 12 | 18 | 6 3 | 20 | 08 | 12 | 4 4 7 2	33 472	3	M1 for complete method for multiplying 523 by 4 and 60 (condone one arithmetic error in multiplication) M1 (dep) for addition (condone one addition error) A1 cao **OR** M1 for complete method for multiplying 500, 20 and 3 by 60 and 4 (condone one arithmetic error in multiplication) M1 (dep) for addition (condone one addition error) A1 cao **OR** M1 for complete method for multiplying 5, 2 and 3 by 6 and 4 (condone one arithmetic error in multiplication) M1 (dep) for addition (condone one addition error) A1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
21	(b)	415 14)5810 56 21 14 70 70 0 4 1 5 14)58 ^{2}1 ^{7}0 5810 1400 – 100 4410 1400 – 100 3010 1400 – 100 1610 1400 – 100 210 140 – 10 70 70 – 5 0 400 + 10 + 5	415	3	M1 for method that establishes 58 ÷ 14 = 4 M1 for a complete method that deals with remainders (condone one arithmetic error) A1 cao **OR** M1 for method that establishes the subtraction of a multiple of 14 or addition of multiples of 14 M1 for a complete method that could lead to the correct answer (condone one arithmetic error) A1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
21	(b)	415 14)5810 56 21 14 70 70 0 4 1 5 14)58 ^{2}1 ^{7}0 5810 1400 – 100 4410 1400 – 100 3010 1400 – 100 1610 1400 – 100 210 140 – 10 70 70 – 5 0 400 + 10 + 5	415	3	M1 for method that establishes 58 ÷ 14 = 4 M1 for a complete method that deals with remainders (condone one arithmetic error) A1 cao **OR** M1 for method that establishes the subtraction of a multiple of 14 or addition of multiples of 14 M1 for a complete method that could lead to the correct answer (condone one arithmetic error) A1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*22			$\frac{29}{40}$	3	M1 for writing $\frac{7}{10}$ as $\frac{28}{40}$ **or** $\frac{3}{5}$ as $\frac{24}{40}$ M1 for writing $\frac{7}{10}$ as $\frac{28}{40}$ **and** $\frac{3}{5}$ as $\frac{24}{40}$ C1 for correct conclusion with supportive evidence **OR** M1 for clear attempt to write all 3 fractions with a common denominator (e.g. 80) with at least 1 numerator correct M1 for all 3 fractions correctly written as equivalent fractions with a common denominator C1 for correct conclusion with supportive evidence **OR** M1 for clear attempt to write all 3 fractions as decimals (or %) with at least 1 correct M1 for all 3 fractions correctly written as decimals (or %) for comparison C1 for correct conclusion with supportive evidence **OR** M1 for drawing grid of 40 (or any multiple of 40) squares **and** shading $\frac{3}{5}$ or $\frac{7}{10}$ or $\frac{29}{40}$ of grid M1 for drawing grid of 40 (or any multiple of 40) squares **and** shading $\frac{3}{5}$ **and** $\frac{7}{10}$ **and** $\frac{29}{40}$ of grid C1 for correct conclusion with supportive evidence

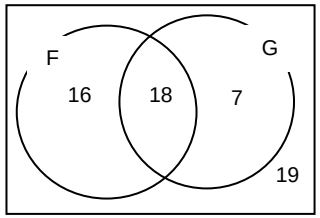
PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*22			$\frac{29}{40}$	3	M1 for writing $\frac{7}{10}$ as $\frac{28}{40}$ **or** $\frac{3}{5}$ as $\frac{24}{40}$ M1 for writing $\frac{7}{10}$ as $\frac{28}{40}$ **and** $\frac{3}{5}$ as $\frac{24}{40}$ C1 for correct conclusion with supportive evidence **OR** M1 for clear attempt to write all 3 fractions with a common denominator (e.g. 80) with at least 1 numerator correct M1 for all 3 fractions correctly written as equivalent fractions with a common denominator C1 for correct conclusion with supportive evidence **OR** M1 for clear attempt to write all 3 fractions as decimals (or %) with at least 1 correct M1 for all 3 fractions correctly written as decimals (or %) for comparison C1 for correct conclusion with supportive evidence **OR** M1 for drawing grid of 40 (or any multiple of 40) squares **and** shading $\frac{3}{5}$ or $\frac{7}{10}$ or $\frac{29}{40}$ of grid M1 for drawing grid of 40 (or any multiple of 40) squares **and** shading $\frac{3}{5}$ **and** $\frac{7}{10}$ **and** $\frac{29}{40}$ of grid C1 for correct conclusion with supportive evidence

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
23			Correct enlargement	2	M1 for 2 lines correctly enlarged **or** a correct enlargement by incorrect scale factor in any orientation A1 for correct enlargement, scale factor 2 in any orientation
*24			115 cm^2	4	M1 for correct method to find area of one part of shape M1 for a complete method to find area A1 for 115 C1 (dep on M1) for '115' cm^2 with the answer clearly identified

PAPER: 5MM1F_01

<table>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>25</td><td>(i)</td><td>
<table>
<tr><th>+</th><th>2</th><th>4</th><th>6</th></tr>
<tr><td>1</td><td>3</td><td>5</td><td>7</td></tr>
<tr><td>2</td><td>4</td><td>6</td><td>8</td></tr>
<tr><td>3</td><td>5</td><td>7</td><td>9</td></tr>
<tr><td>4</td><td>6</td><td>8</td><td>10</td></tr>
<tr><td>5</td><td>7</td><td>9</td><td>11</td></tr>
<tr><td>6</td><td>8</td><td>10</td><td>12</td></tr>
</table>
</td><td>$\frac{3}{18}$</td><td>5</td><td>M1 for identifying or using 1 + 6 (= 7) and 3 + 4 (= 7) and 5 + 2 (= 7)
M1 (indep) for 18 seen or 18 outcomes
or sample space with 18 possibilities
or list of 18 ordered pairs
A1 for $\frac{3}{18}$ oe

ALTERNATIVE METHOD
M1 for $\frac{1}{6}\times\frac{1}{3}$ oe seen
M1 for $3\times\frac{1}{6}\times\frac{1}{3}$ oe
A1 for $\frac{3}{18}$ oe</td></tr>
<tr><td></td><td>(ii)</td><td></td><td>$\frac{4}{18}$</td><td></td><td>M1 for identifying or using all four possible of 2+1 (= 3), 2+2 (= 4), 2+3 (= 5) and 4+1 (= 5), condone inclusion of 2+ 4 (= 6) and/or 4 +2 (= 6) or ft from their ordered list in part (i)
A1 for $\frac{4}{18}$ oe
[SC: If M0 scored, award B1 for $\frac{6}{18}$ oe]</td></tr>
</table>

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
26		$2 \times (4x - 3 + 2x + 5) = 46$ $2 \times (6x + 2) = 46$ $6x + 2 = 23$ $6x = 21$ $x = 3.5$ $4 \times 3.5 - 3 = 11$ $2 \times 3.5 + 5 = 12$ 11×12	132	5	M1 for $2 \times (4x - 3 + 2x + 5)$ oe or $4x - 3 + 2x + 5$ oe M1 for $2 \times (4x - 3 + 2x + 5) = 46$ oe or $4x - 3 + 2x + 5 = 23$ oe M1 (dep on M2) for correct process to isolate terms in x or ($x =$) 3.5 oe M1 (dep on M3) for substituting their value of x into $4x - 3$ **or** $2x + 5$ **or** 12 seen as length **or** 11 seen as width A1 cao
27	(a)		Correct Venn diagram	4	M1 for two overlapping ovals M1 for 18 shown in the intersection M1 for $34 - 18$ (= 16) or $25 - 18$ (= 7) A1 for fully correct Venn diagram with correct labels
	(b)		$\frac{19}{60}$	2	M1 (ft part a) for $\frac{'19'}{a}$, $a >$ '19' or $\frac{b}{60}$, $b < 60$ with $b \neq 0$ A1 cao for $\frac{19}{60}$ oe

Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5º
Measurements of length: ±5 mm

PAPER: 5MM1F_01			
Question		**Modification**	**Notes**
Q2	(a)	2 cm grid. 'mirror' 'line' marked at the top as well as bottom	
	(b)	2 cm grid. cut-out square provided	
Q6		Probability scale lengthened	
Q8		Letters and numbers put level in boxes	
Q9		2cm grid. Cross changed to solid circle	
	(b)	Q2 'with a cross (x)' removed	
Q12		Vertical line put at A B C and D. Measurement arrow removed and 8.6cm move up between A and B	

PAPER: 5MM1F_01			
Question		**Modification**	**Notes**
Q13	(a)	*t* changed to *p*	
Q14		Patterns put vertically	
Q15	(b)	Rectangle D removed, E relabelled as D, F as E and G as F. 2 cm grid. '7 shaded rectangles' changed to '6'	
Q16		Single rectangle – labelled top and left	
Q17		*a* changed to *e*, *b* changed to *f*	
Q19		'…the size of the angle marked *y*'	
Q23		2cm grid – last 2 columns removed to fit in page more easily. Dotty shading for shape	
Q26		*x* changed to *y*. Diagram labels top and left	
Q27		Diagram sheet put into Diagram Book instead of answer space in the paper.	

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Write your name here

Surname	Other names

Pearson
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Centre Number | | | | | |

Candidate Number | | | | |

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Monday 11 November 2013 – Morning
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P43605A

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6/5/5/5/

P 4 3 6 0 5 A 0 1 3 2

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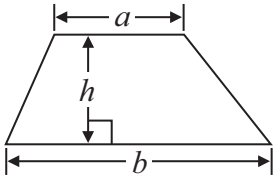
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GCSE Mathematics 2MM01

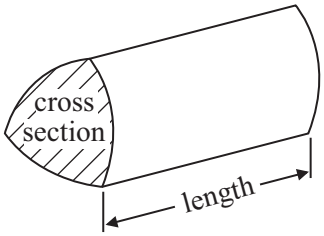
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 (a) Write the number 6050 in words.

.....

(1)

(b) Write 15.83 correct to the nearest whole number.

.....

(1)

(c) Write 5748 correct to the nearest hundred.

.....

(1)

(d) What is the value of the figure **8** in the number 4185?

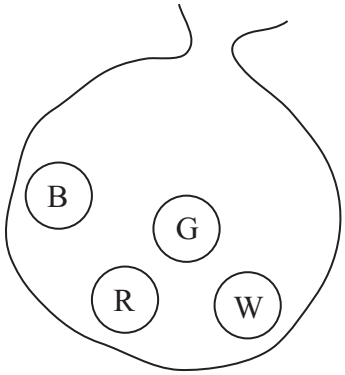
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(1)

(Total for Question 1 is 4 marks)

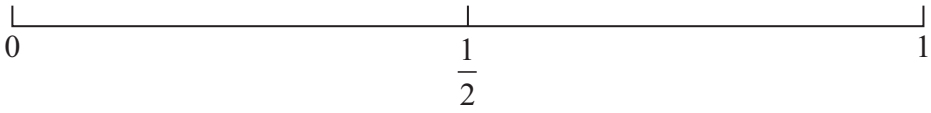
2 There are four beads in a bag.

One bead is blue, one bead is green, one bead is red and one bead is white.



Robert takes at random a bead from the bag.

(a) On the probability scale, mark with a cross (×) the probability that Robert takes a blue bead.



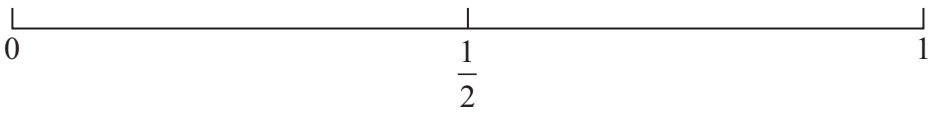
(1)

(b) Circle the word that best describes the likelihood that Robert takes a yellow bead.

impossible unlikely even likely certain

(1)

(c) On the probability scale, mark with a cross (×) the probability that Robert takes a red bead or a white bead.



(1)

(Total for Question 2 is 3 marks)

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3 (a) Write these numbers in order of size.
Start with the smallest number.

85 107 111 93 102

.....

(1)

(b) Write these numbers in order of size.
Start with the smallest number.

−6 2 7 −1 4

.....

(1)

(c) Work out the number that is halfway between

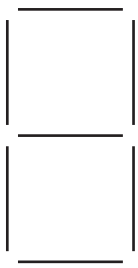
$\frac{4}{5}$ and 1.1

.....

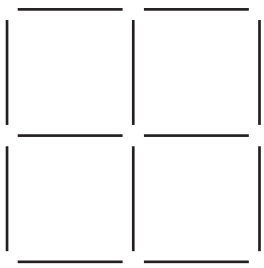
(2)

(Total for Question 3 is 4 marks)

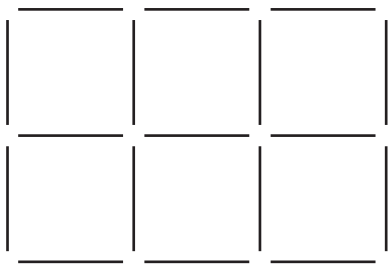
4 Here are some patterns made from sticks.



Pattern number 1



Pattern number 2



Pattern number 3

(a) In the space below, draw Pattern number 4

(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of sticks	7	12	17		

(1)

Hattie says

"The number of sticks in Pattern number 6 is twice the number of sticks in Pattern number 3."

(c) Is Hattie right?
You must explain your answer.

.....

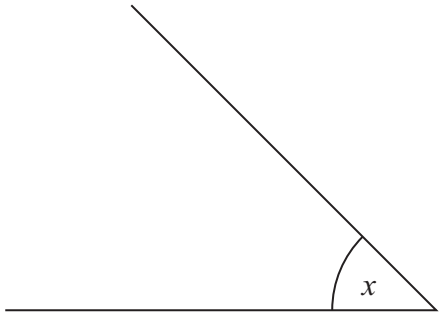
.....

(1)

(Total for Question 4 is 3 marks)

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5



(a) (i) What type of angle is the angle marked x?

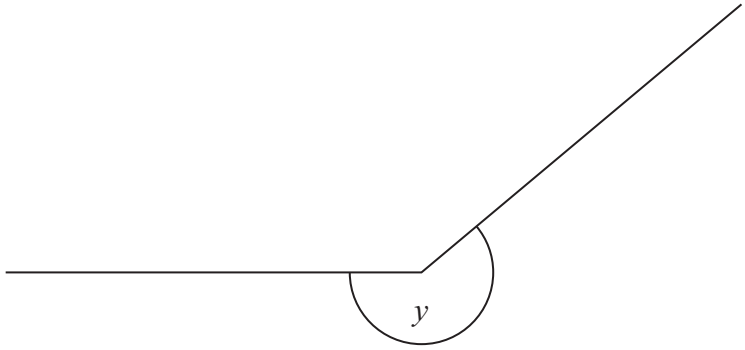
.....

(ii) Estimate the size of the angle marked x.

..... °

(2)

(b)



Sunita says that $y = 140°$

Is Sunita right?
Explain your answer.

.....

.....

(1)

(Total for Question 5 is 3 marks)

6 Tom is x years old.

Lily is 5 years younger than Tom.

(a) Write down an expression, in terms of x, for Lily's age.

.....

(1)

Richard is twice as old as Tom.

(b) Write down an expression, in terms of x, for Richard's age.

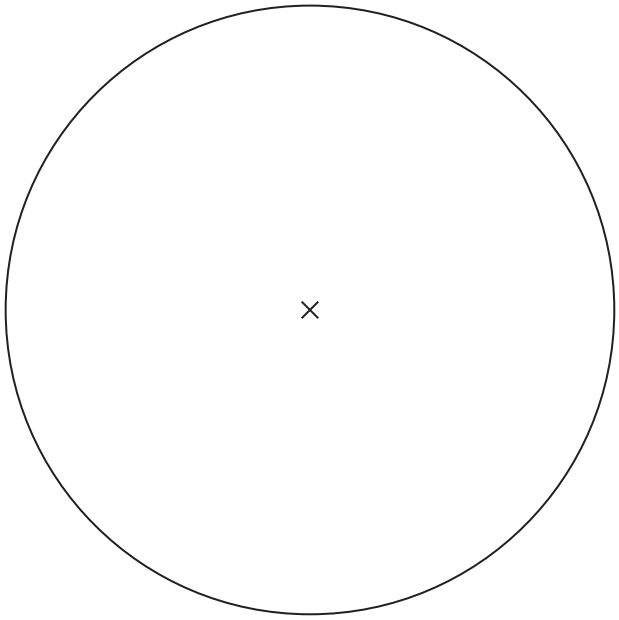
.....

(1)

(Total for Question 6 is 2 marks)

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7 Here is a circle.



The circle has a radius of 4 cm.

(a) Write down the length of the diameter of this circle.

..... cm

(1)

(b) On the diagram, draw a tangent to the circle.

(1)

(Total for Question 7 is 2 marks)

8 $r + s + t = 100$

$r = 15$
$s = 25$

Work out the value of t.

.....

(Total for Question 8 is 2 marks)

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9 Here are ten letters.

A B B C C C D D D D

Jason takes at random one of the ten letters.

(a) Which letter is Jason most likely to take?

.....

(1)

(b) Write down the probability Jason takes the letter A.

.....

(1)

(Total for Question 9 is 2 marks)

***10**

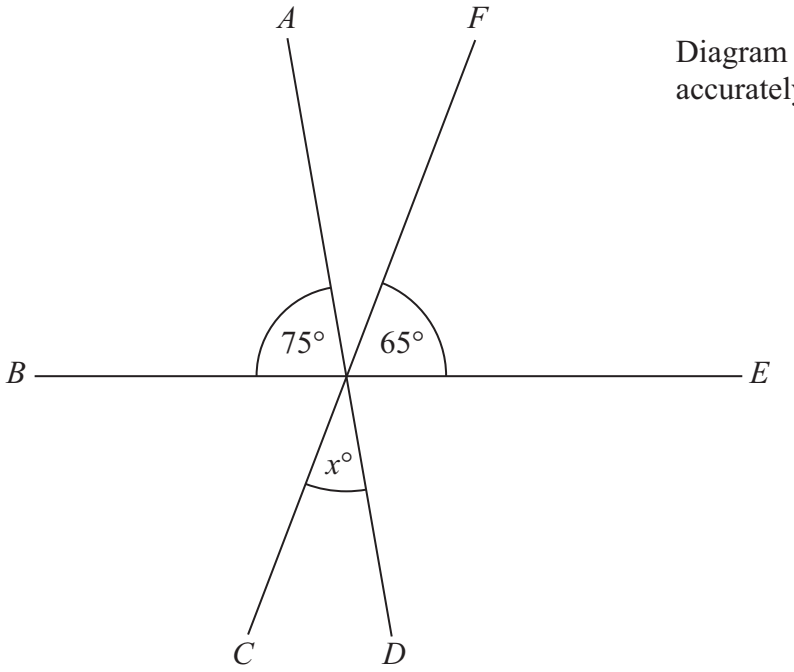


Diagram **NOT** accurately drawn

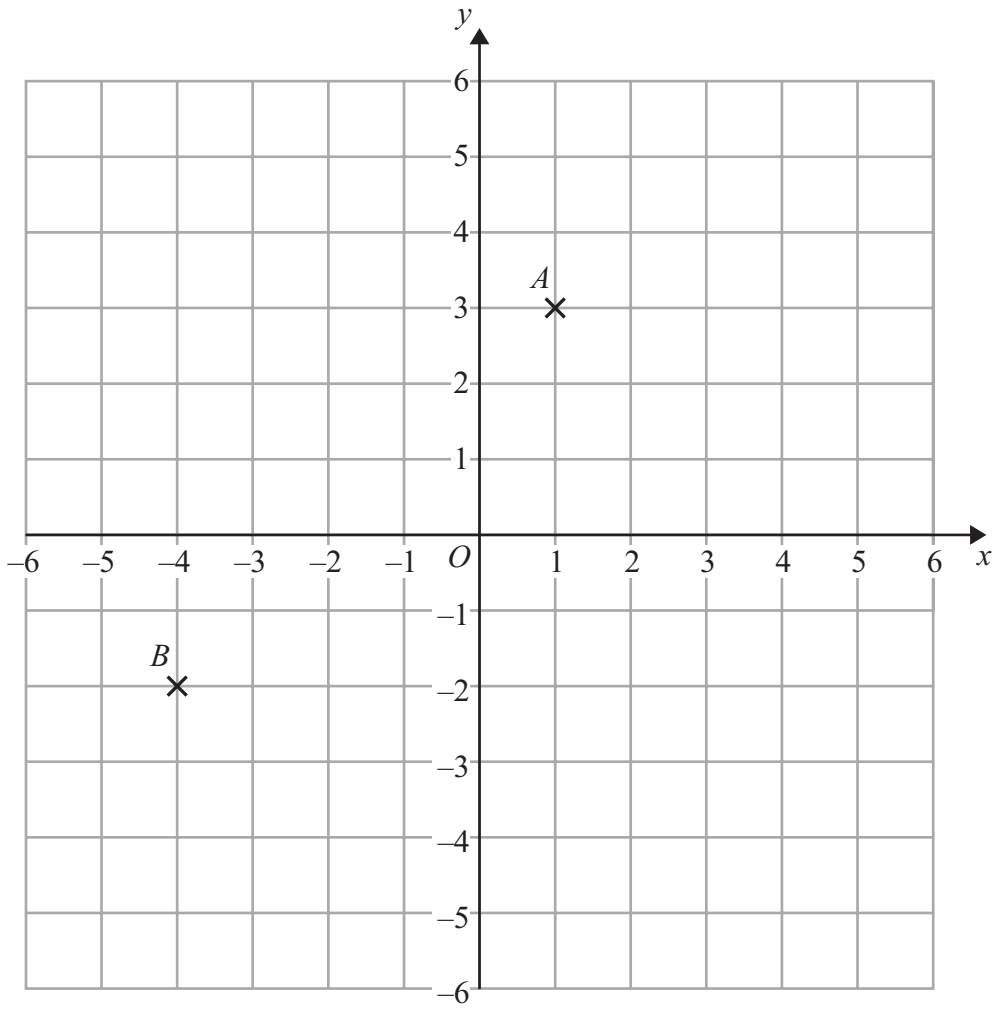
AD, *BE* and *FC* are straight lines.

Work out the value of *x*.
Give reasons for your answer.

(Total for Question 10 is 4 marks)

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11



(a) (i) Write down the coordinates of the point A.

(.....,.....)

(ii) Write down the coordinates of the point B.

(.....,.....)

(2)

(b) On the grid, plot the point $(-3, 0)$.
Label the point C.

(1)

D is another point on the grid.
The coordinates of the midpoint of AD are $(1, -1)$.

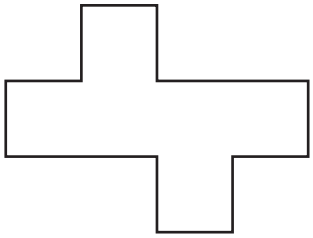
(c) Find the coordinates of the point D.

(.....,.....)

(2)

(Total for Question 11 is 5 marks)

12 Here is a shape.

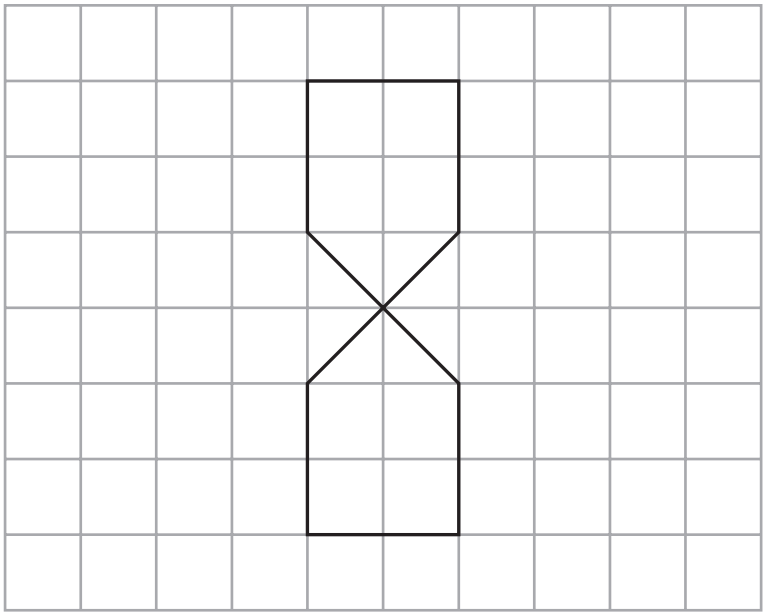


(a) Write down the order of rotational symmetry of the shape.

.....

(1)

Here is part of a different shape.



(b) Complete this shape so that it has rotational symmetry of order 4

(1)

(Total for Question 12 is 2 marks)

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13 Here is a list of numbers.

$$-2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4$$

From the list,

(a) write down **two** different numbers that add together to give 0

.....

(1)

(b) write down **two** different numbers that multiply together to give 0

.....

(1)

(c) write a different number in each box to make the statement true.

$$\square \times \square \times \square = -12$$

(2)

(Total for Question 13 is 4 marks)

14 The probability that Emma will win a prize is 0.2
The probability that Sheila will win a prize is 0.05

(a) Who is more likely to win a prize, Emma or Sheila?
Give a reason for your answer.

.....

.....

(1)

(b) Work out the probability that Emma does **not** win a prize.

.....

(2)

(Total for Question 14 is 3 marks)

15 (a) Simplify $3p - p$

.....

(1)

(b) Simplify $t \times t$

.....

(1)

(c) Simplify $2x + 3y - x + y$

.....

(2)

(Total for Question 15 is 4 marks)

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16 (a) Write down a factor of 30

.....

(1)

(b) Write down a multiple of 6

.....

(1)

(c) Write down a square number.

.....

(1)

*(d) Here is a statement.

"If you multiply any prime number by 2 and then subtract 1 you always get another prime number."

Is this statement right?

Give a reason for your answer.

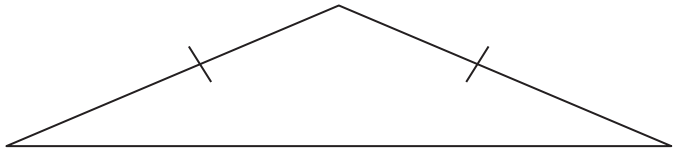
.....

.....

(2)

(Total for Question 16 is 5 marks)

17 Here is a triangle.

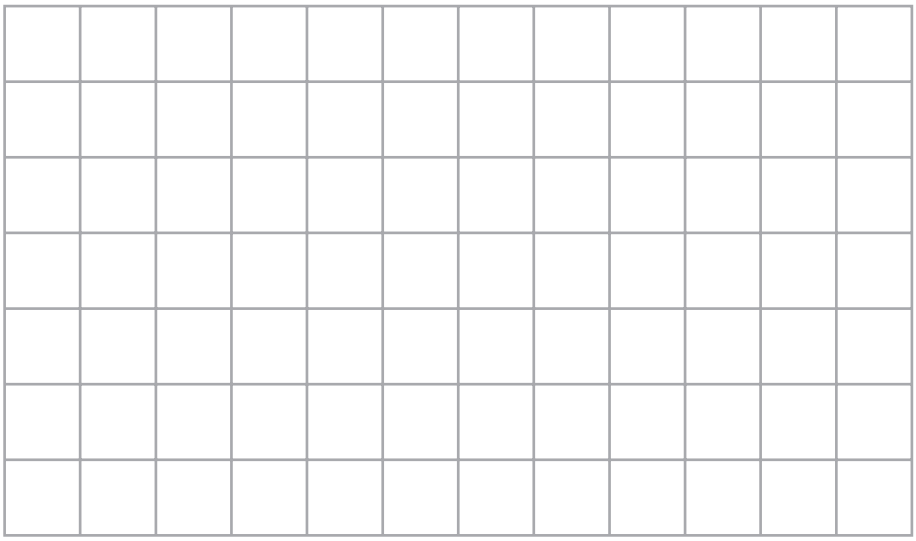


(a) Write down the mathematical name for this triangle.

.....

(1)

(b) On the grid, draw a four-sided shape that has exactly one pair of parallel sides.



(1)

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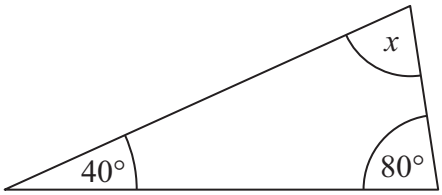


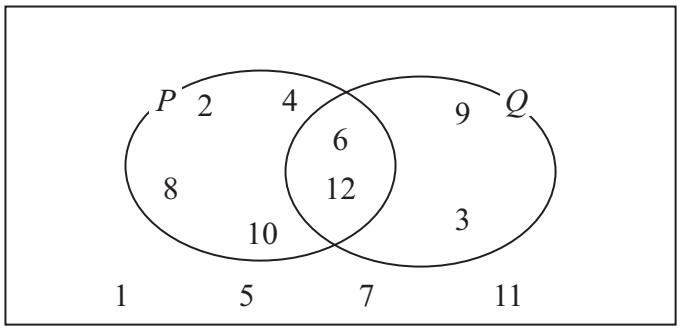
Diagram **NOT** accurately drawn

*(c) Work out the size of the angle marked x.
Give a reason for your answer.

(3)

(Total for Question 17 is 5 marks)

18 Here is a Venn diagram.



(a) Write down the numbers that are in set Q.

.....

(2)

(b) Write down the numbers that are in set P but are **not** in set Q.

.....

(1)

(c) Write down the numbers that are in set P **and** also in set Q.

.....

(1)

A student chooses at random a number from the Venn diagram.

(d) Write down the probability that this number is **not** in set Q.

.....

(2)

(Total for Question 18 is 6 marks)

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19 (a) Write $\frac{7}{5}$ as a mixed number.

.....

(1)

(b) Write $\frac{15}{55}$ as a fraction in its simplest form.

.....

(1)

*(c) Here are two fractions.

$$\frac{3}{8} \qquad \frac{1}{6}$$

Which of these fractions has a value closest to $\frac{1}{4}$?
You must show clearly how you get your answer.

(4)

(Total for Question 19 is 6 marks)

20 (a) Solve $x - 7 = 3$

.....

(1)

(b) Solve $2p + 7 = 23$

.....

(2)

(Total for Question 20 is 3 marks)

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21 Jo throws a biased dice 100 times.
Each time she records the number it shows.

Here are her results.

Number shown	1	2	3	4	5	6
Frequency	18	12	25	13	21	11

Jo throws the dice one more time.

(a) Estimate the probability that the dice will land showing

(i) the number 3

.....

(ii) an even number

.....

(3)

Luke and Martha have a coin.
They want to find an estimate for the probability that this coin will land on heads.

Luke throws the coin 10 times and records his results.
Martha throws the coin 100 times and records her results.

(b) Who is likely to get the better estimate, Luke or Martha?
Give a reason for your answer.

.....

.....

(1)

(Total for Question 21 is 4 marks)

22 Work out 365×28

.....

(Total for Question 22 is 3 marks)

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23 Here is a square.

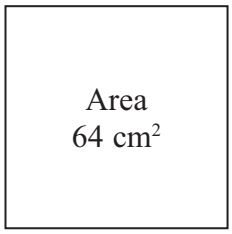


Diagram **NOT** accurately drawn

The area of the square is 64 cm².

(a) Work out the length of one side of the square.

..... cm

(1)

Here is a rectangle.

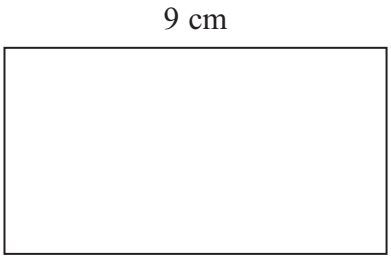


Diagram **NOT** accurately drawn

The length of the rectangle is 9 cm.
The perimeter of the rectangle is 31 cm.

(b) Work out the width of the rectangle.

.....

(4)

(Total for Question 23 is 5 marks)

24

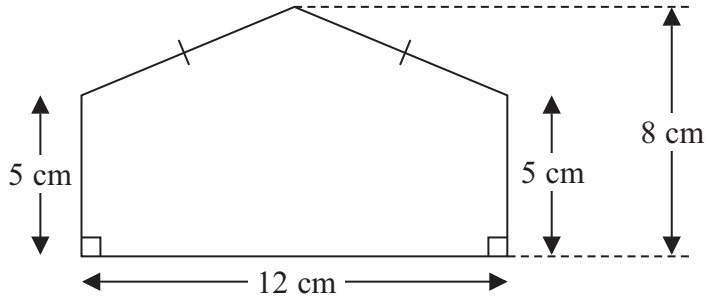


Diagram **NOT** accurately drawn

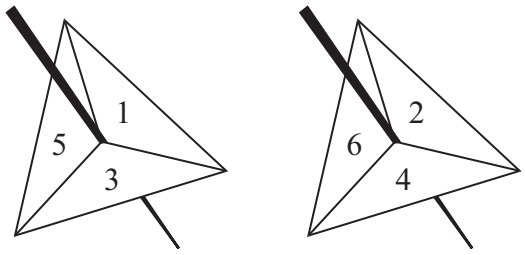
Work out the area of the shape.

..... cm^2

(Total for Question 24 is 4 marks)

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25 Jack has two fair 3-sided spinners.



Jack spins each spinner once.
Each spinner lands on a number.

Jack multiplies these two numbers together to get his score.

(i) Work out the probability that Jack's score is 6

.....

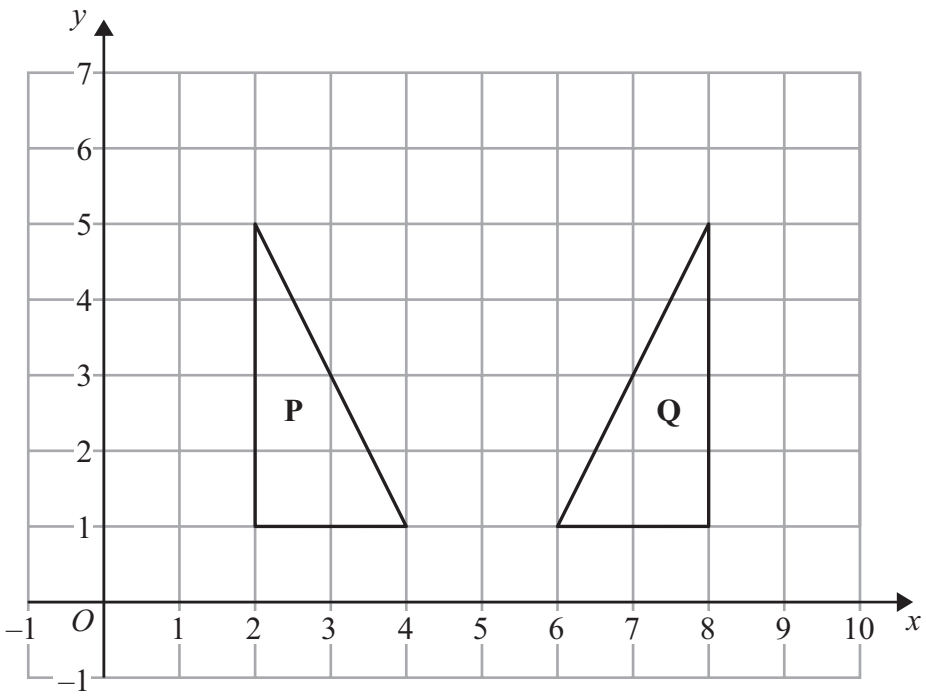
(ii) Work out the probability that Jack's score is at least 10

.....

(Total for Question 25 is 5 marks)

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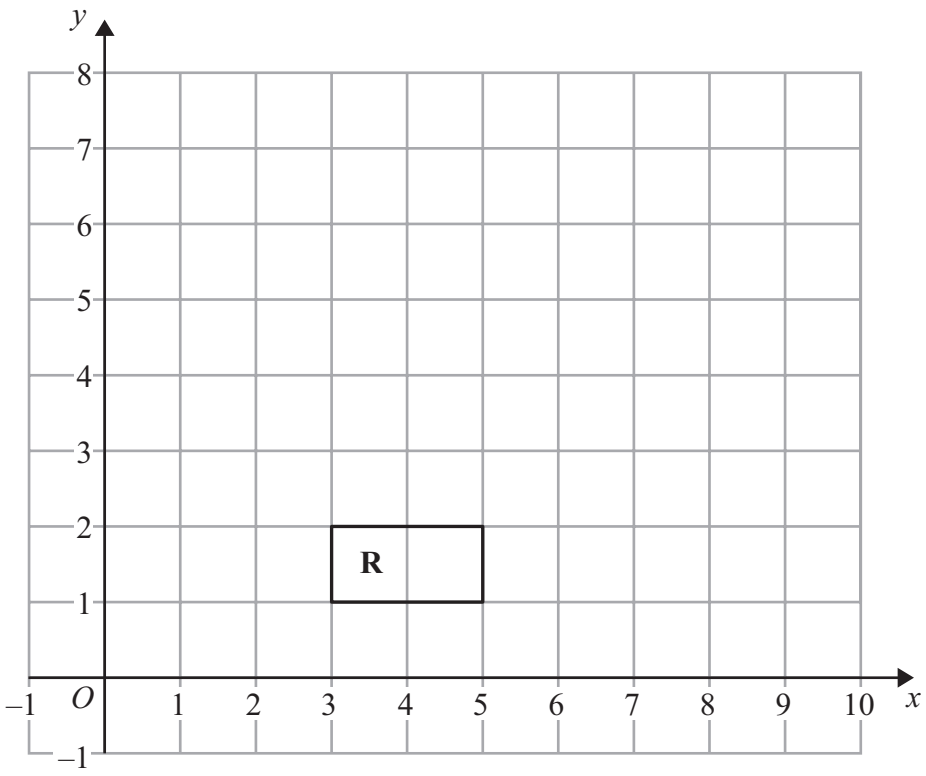
26



(a) Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

.....

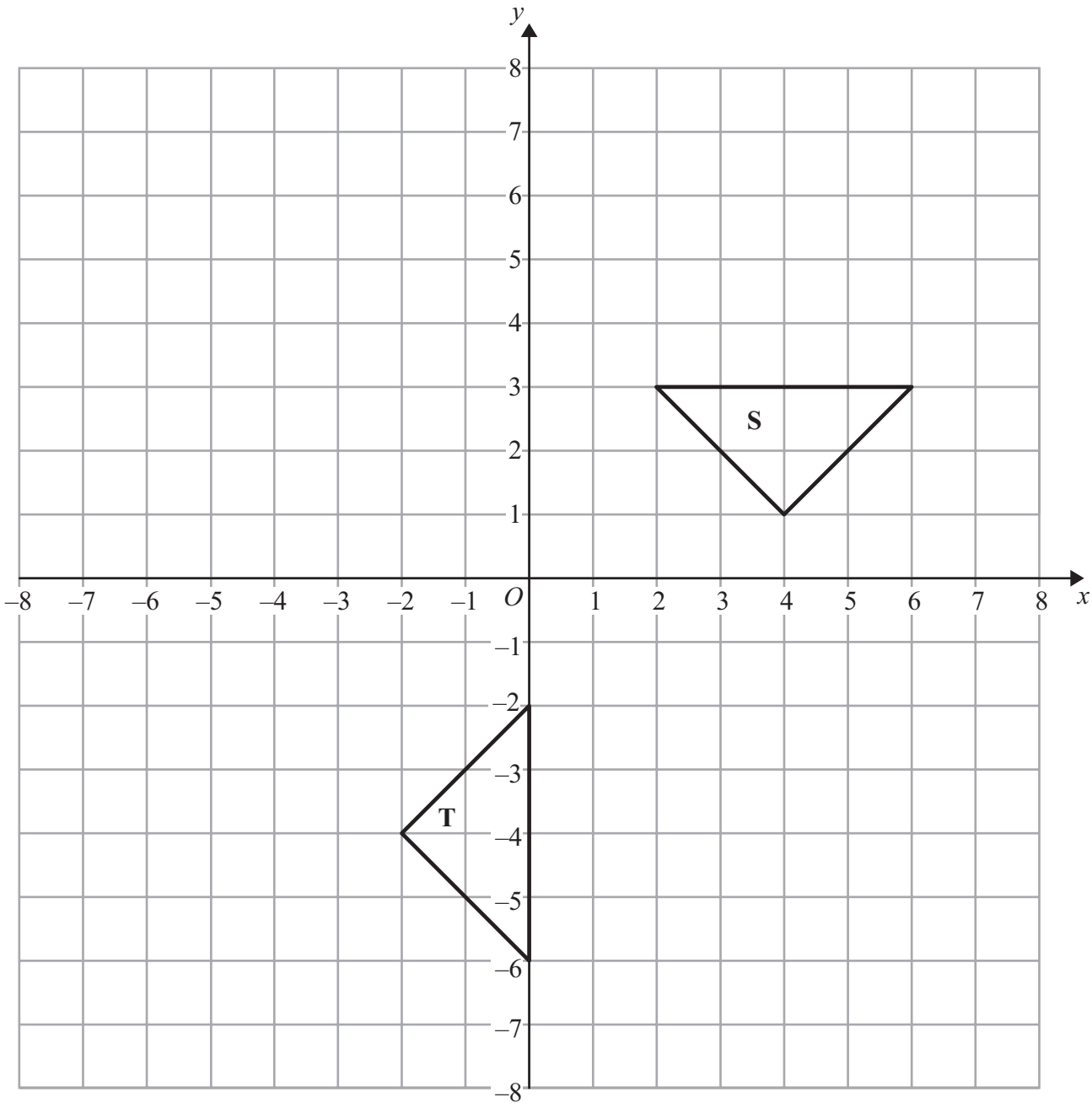
(2)



(b) Enlarge rectangle **R**, with scale factor 3 and centre (4, 0).

(2)

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Shape **S** can be transformed to shape **T** by the translation $\begin{pmatrix} 0 \\ -3 \end{pmatrix}$ followed by a rotation.

(c) Describe the rotation.

.....

.....

(3)

(Total for Question 26 is 7 marks)

TOTAL FOR PAPER IS 100 MARKS

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Mark Scheme (Results)

November 2013

Pearson Edexcel GCSE
Linked Pair Pilot in Mathematics
Methods in Mathematics (2MM01)
Foundation Paper 1F

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Six thousand (and) fifty	1	B1 cao
	(b)		16	1	B1 cao
	(c)		5700	1	B1 cao
	(d)		80	1	B1 (accept in words)
2	(a)		× at $\frac{1}{4}$	1	B1 for cross at $\frac{1}{4}$ (accept between $\frac{1}{8}$ and $\frac{3}{8}$)
	(b)		impossible	1	B1 cao
	(c)		× at $\frac{1}{2}$	1	B1 for cross at $\frac{1}{2}$
3	(a)		85, 93, 102, 107, 111	1	B1 cao
	(b)		$-6, -1, 2, 4, 7$	1	B1 cao
	(c)		0.95	2	M1 for a complete correct method to find the halfway point A1 for 0.95 oe

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)			1	B1 for correct diagram
	(b)		22, 27	1	B1 cao
	(c)		No + explanation	1	C1 for no + explanation, eg number of sticks in pattern number 6 is 32 and the number of sticks in pattern number 3 is 17, 2 × 17 is not 32 or ft from (b)
5	(a)(i)		Acute	2	B1
	(ii)		45		B1 for value in the range 40 to 50
	(b)		No with explanation	1	B1 for no with explanation, eg it is 220°, it is reflex, it is greater than 180°
6	(a)		$x - 5$	1	B1 for $x - 5$ oe
	(b)		$2x$	1	B1 for $2x$ oe

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
7	(a)		8	1	B1 for 8
	(b)		tangent drawn	1	B1 for any tangent drawn
8			60	2	M1 for $15 + 25 + t = 100$ oe A1 cao
9	(a)		D	1	B1 cao
	(b)		$\frac{1}{10}$	1	B1 for $\frac{1}{10}$ or 0.1 or 10%
*10			40 and reasons	4	M1 for $180 – (75 + 65)$ oe A1 for 40 C2 (dep M1) for $x = 40$ **and** Vertically opposite angles are equal **and** Angles on a straight line add up to 180^o (C1 (dep M1) for 1 correct reason) or M1 for $(360 – 2 \times (75 + 65)) \div 2$ oe A1 for 40 C2 (dep M1) for $x = 40$ **and** Vertically opposite angles are equal **and** Angles at a point add up to 360^o (C1 (dep M1) for 1 correct reason)

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)(i)		(1, 3)	2	B1 cao
	(ii)		(−4, −2)		B1 cao
	(b)		(−3, 0) plotted	1	B1 for (−3, 0)
	(c)		(1, −5)	2	M1 for −1 – 4 (= −5) or (1, *y*) or (1, −5) plotted on the diagram A1 for (1, −5)
12	(a)		2	1	B1 cao
	(b)		Completed shape	1	B1 for completing the given shape to give any correct shape which has rotational symmetry of order 4
13	(a)		−2, 2 or −1, 1	1	B1 cao
	(b)		0, −2 or 0, −1 or 0, 1 or 0, 2 or 0, 3 or 0, 4	1	B1 cao
	(c)		-2, 3, 2 or -1, 3, 4	2	M1 for any three numbers from the list whose product is a negative number or 12 (condone repeats) A1 cao
14	(a)		Emma + reason	1	C1 for Emma with reason, eg 0.2 is greater than 0.05
	(b)		0.8	2	M1 for 1 − 0.2 oe A1 for 0.8 oe

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		$2p$	1	B1 for $2p$ (accept $p2$)
	(b)		t^2	1	B1 for t^2
	(c)		$x + 4y$	2	M1 for $2x - x$ (= x) or $3y + y$ (= $4y$) A1 for $x + 4y$ oe
16	(a)		1 or 2 or 3 or 5 or 6 or 10 or 15 or 30	1	B1 for 1 or 2 or 3 or 5 or 6 or 10 or 15 or 30
	(b)		any multiple of 6	1	B1 for any multiple of 6
	(c)		any square number	1	B1 for any square number
	*(d)		No and explanation	2	M1 for 2 × prime number − 1 C1 (dep) for no and a counter example
17	(a)		isosceles	1	B1
	(b)		shape drawn	1	B1 for sketch of trapezium (do not accept a parallelogram)
	*(c)		60 + Reason	3	M1 for 180 − 80 − 40 A1 for $x = 60$ C1 for Angles in a triangle add up to 180^o

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)		3, 6, 9, 12	2	M1 for writing down at least two numbers from set Q with no incorrect responses. A1 cao
	(b)		2, 4, 8, 10	1	B1 cao
	(c)		6, 12	1	B1 cao
	(d)		$\frac{8}{12}$	2	M1 for $\frac{x}{12}$, $x \neq 8$, $x < 12$ or $\frac{8}{x}$, $x \neq 12$, $x > 8$ A1 for $\frac{8}{12}$ oe or ft from (a)
19	(a)		$1\frac{2}{5}$	1	B1 for $1\frac{2}{5}$ oe
	(b)		$\frac{3}{11}$	1	B1 cao

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
19 (cont)	*(c)		$\frac{1}{6}$	4	M1 for attempting to write at least two fractions expressed with a suitable common denominator (multiple of 24) and at least one of the two fractions correct M1 for attempting to write all three fractions with a common denominator and at least two of the three fractions correct A1 for three fully correct fractions C1 for correct conclusion including comparisons to $\frac{1}{4}$ (dep M2 and comparison of 3 fractions with a correct common denominator) OR M1 for writing $\frac{3}{8}$ as 0.375 or 37.5% or $\frac{1}{6}$ as 0.16(…) or 16(.66…)% or $\frac{1}{4}$ as 0.25 or 25% M1 for attempting to write all three fractions as decimals or percentages and at least two of the three correct A1 for fully correct decimals or percentages C1 for correct conclusion including comparisons to 0.25/25% (dep M2 and comparison of 3 decimals or 3 percentages)

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)		10	1	B1 cao
	(b)		8	2	M1 for an attempt to subtract 7 from both sides or divide both sides by 2 as a first step A1 cao
21	(a)(i)		$\frac{25}{100}$	3	B1 for $\frac{25}{100}$ oe
	(ii)		$\frac{36}{100}$		M1 for 12 + 13 + 11 (=36) A1 for $\frac{36}{100}$ oe
	(b)		Martha and reason	1	B1 for Martha and statement that implies more trials gives a more accurate probability oe

PAPER: 5MM1F_01

Question		Working	Answer	Mark	Notes
22		365 28× 2920 7300+ 10220	10220	3	M1 for a complete method with relative place value correct- condone one multiplication error addition not necessary M1 (dep) for addition of all relevant elements. A1 cao OR M1 for complete grid. Condone one multiplication error, addition not necessary M1 (dep) for addition of all relevant elements. A1 cao OR M1 for sight of complete partitioning method. Condone one multiplication error. Final addition not necessary. M1 (dep) for addition of all relevant elements. A1 cao (SC B1 for attempting to add 28 lots of 365 if M0 scored)

×	300	60	5
20	6000	1200	100
8	2400	480	40

6000+2400+1200+480+100+40

	3	6	5	
	0 6	1 2	1 0	2
	2 4	4 8	4 0	8
10	2	2	0	

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
23	(a)		8	1	B1 cao
	(b)		6.5 cm	4	M1 for $31 - 9 - 9$ (=13) M1 for "13" ÷ 2 A1 for 6.5 oe C1 for units (cm) or M1 for $x + 9 + x + 9 = 31$ oe (do not accept cm in equation) M1 for $\frac{31 - 9 - 9}{2}$ A1 for 6.5 oe C1 for units (cm)

PAPER: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
24			78	4	M1 for a correct method to find the area of a relevant rectangle. M1 for a correct method to find the area of a relevant triangle. M1 for a complete and correct method to find the total area A1 cao or M2 for splitting the shape into two trapeziums and using a correct method to find the area of the trapezium M1 for 2 x 'area of trapezium' A1 cao

PAPER: 5MM1F_01

Question		Working	Answer	Mark	Notes
25	(i)	$(\frac{1}{3}\times\frac{1}{3})+(\frac{1}{3}\times\frac{1}{3})$	$\frac{2}{9}$	5	M1 for identifying there are 9 possible outcomes or $(\frac{1}{3}\times\frac{1}{3})$ M1 for clearly identifying the two outcomes (1, 6) and (3, 2) or $(\frac{1}{3}\times\frac{1}{3})+(\frac{1}{3}\times\frac{1}{3})$ A1 for $\frac{2}{9}$ oe
	(ii)	× | 1 | 3 | 5 2 | 2 | 6 | 10 4 | 4 | 12 | 20 6 | 6 | 18 | 30	$\frac{5}{9}$		M1 for identifying the 5 correct outcomes or at least 4 correct with no more than one incorrect A1 for $\frac{5}{9}$ oe
26	(a)		reflection in $x = 5$	2	B1 for reflection B1 for $x = 5$
	(b)		rectangle with vertices (1, 3),(1, 6), (7, 6), (7, 3)	2	M1 for enlargement sf 3 A1 for fully correct answer
	(c)		90° clockwise, centre (0, 0)	3	B2 90° clockwise or 270° anticlockwise (B1 90° or 270° stated without direction or with incorrect direction or correct translation of S shown) B1 centre (0,0)





Llywodraeth Cynulliad Cymru
Welsh Assembly Government



Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Monday 17 June 2013 – Morning
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P40650A

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6/6/8/

P 4 0 6 5 0 A 0 1 2 4

PEARSON

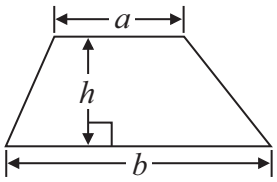
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GCSE Mathematics 2MM01

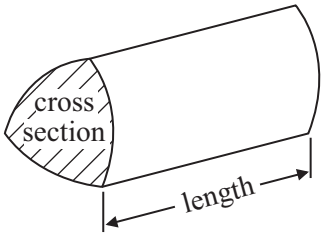
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 (a) Write the number 3506 in words.

.....

.....

(1)

(b) Write the number **one thousand four hundred and twenty five** in figures.

.....

(1)

(c) Write 82 553 correct to the nearest thousand.

.....

(1)

(d) Write 3.74 correct to **one** decimal place.

.....

(1)

(Total for Question 1 is 4 marks)

---

2 (a) Write these numbers in order of size.
Start with the smallest number.

18 84 45 138 53

.....

(1)

(b) Write these numbers in order of size.
Start with the smallest number.

5.06 0.56 5.6 0.65 6.5

.....

(1)

(Total for Question 2 is 2 marks)

3

impossible	unlikely	even	likely	certain

Use a word from the box that best describes the likelihood of each of the following events.

(a) You take a red marble out of a bag that has only blue and green marbles in it.

.....

(1)

(b) You throw a fair coin and get a tail.

.....

(1)

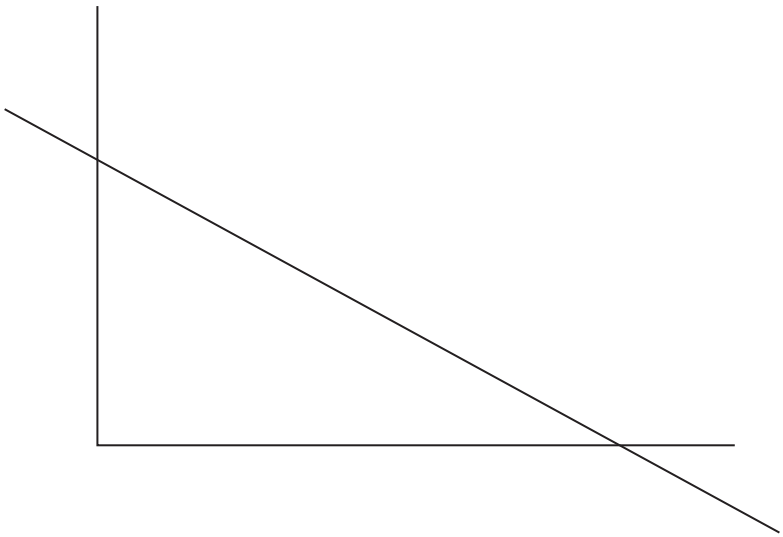
(c) You throw a fair dice and get a number less than 5

.....

(1)

(Total for Question 3 is 3 marks)

4



(a) Mark, with the letter *A*, an acute angle.

(1)

(b) Mark, with the letter *R*, a right angle.

(1)

(Total for Question 4 is 2 marks)

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5 (a) Work out 367 + 128

.....

(2)

(b) Work out 15.6 – 4.37

.....

(2)

(c) Work out 3.8×4

.....

(2)

(d) Work out $-7 + 9$

.....

(1)

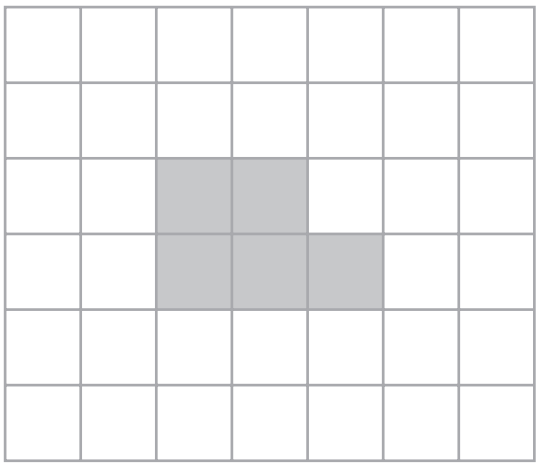
(e) Work out 5×-6

.....

(1)

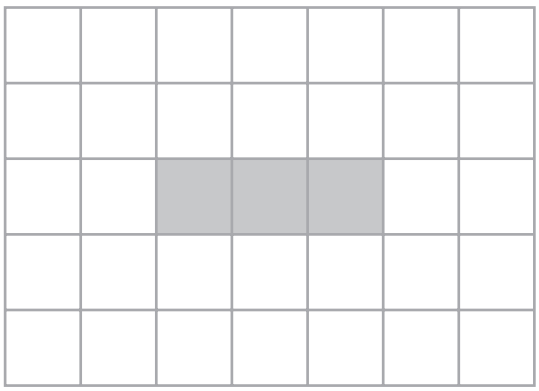
(Total for Question 5 is 8 marks)

6 (a) On the diagram below, shade **one** square so that the shape has rotational symmetry of order 2



(1)

(b) On the diagram below, shade **one** square so that the shape has only one line of symmetry.



(1)

(Total for Question 6 is 2 marks)

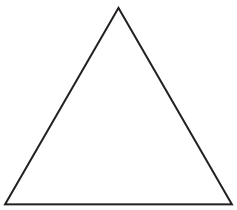
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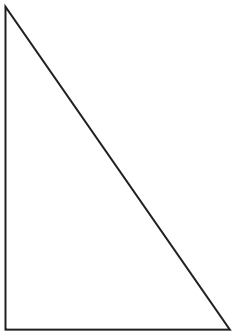
***7** Which is bigger $\frac{2}{5}$ or 0.6?

Give a reason for your answer.

(Total for Question 7 is 3 marks)

8 Write down the mathematical name of each of these triangles.





(i) ..... (ii) .....

(Total for Question 8 is 2 marks)

9 Here are the first five terms of two number sequences, A and B.

Sequence A	1	3	5	7	9
Sequence B	0	3	6	9	12

The numbers 3 and 9 are in both sequences.

Find another number that is in both sequences.

.....

(Total for Question 9 is 3 marks)

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10 (a) Work out $12 \div 4 + 7$

.....

(1)

(b) Work out $(4 + 3) \times 5$

.....

(1)

(c) Work out $20 - 6 \times 2$

.....

(1)

(Total for Question 10 is 3 marks)

11 Here is a list of eight numbers.

6 16 17 18 24 27 33 37

From the list, write down

(i) **two** numbers that add up to 50

..... and .....

(ii) a factor of 48

.....

(iii) a multiple of 12

.....

(iv) a square number

.....

(Total for Question 11 is 4 marks)

***12** Here are three calculations.

The sum of 14 and 19	The difference between 57 and 29

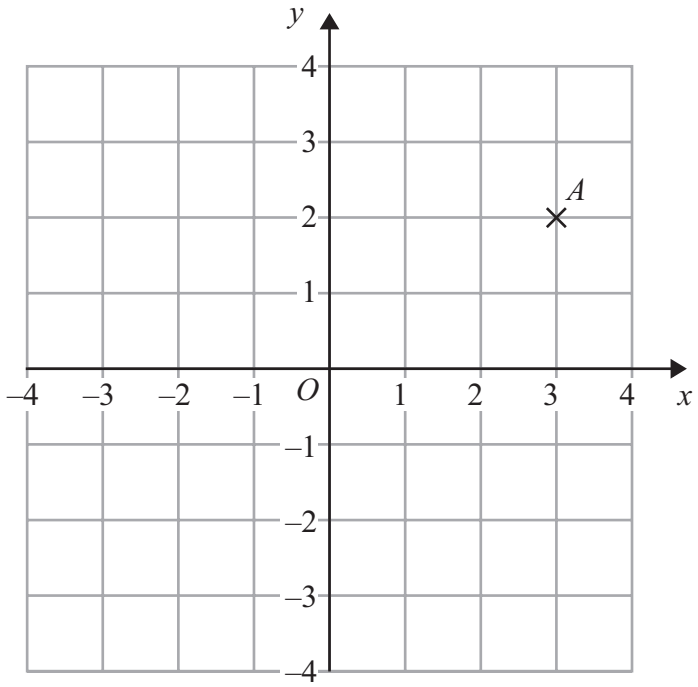
The product of 9 and 4

Which of these calculations has the biggest answer?
You must show how you got your answer.

(Total for Question 12 is 3 marks)

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13 Here is a coordinate grid.



(a) Write down the coordinates of the point A.

(..... , ...)

(1)

(b) On the grid, mark with a cross (×) the point (–2, 1).
Label this point B.

(1)

(Total for Question 13 is 2 marks)

14 (a) Write $\frac{9}{15}$ in its simplest form.

.....

(1)

(b) Write $\frac{29}{8}$ as a mixed number.

.....

(1)

(c) Work out $\frac{4}{9} + \frac{1}{3}$

.....

(2)

(Total for Question 14 is 4 marks)

---

15 Here are the first five terms of a number sequence.

9 13 17 21 25

(a) Find the 8th term of the sequence.

.....

(1)

200 is **not** in this sequence.

(b) Explain why.

.....

.....

(1)

(Total for Question 15 is 2 marks)

16 There are four counters in a bag.
There is one red counter, one blue counter, one green counter and one yellow counter.

Roberto takes at random a counter from the bag.

(a) What is the probability that he takes a blue counter?

.....

(1)

Roberto puts the counter back in the bag.

Tia takes at random two counters from the bag.
She records the colours of the counters.

(b) Write down all the possible outcomes.

.....

.....

.....

(2)

(Total for Question 16 is 3 marks)

---

17 (a) Simplify $w + w + w - w$

.....

(1)

(b) Simplify $5 \times d \times e$

.....

(1)

(c) Simplify $4a + 5b + 3a - 3b$

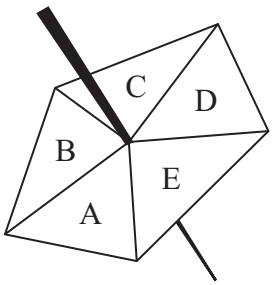
.....

(2)

(Total for Question 17 is 4 marks)

18 Here is a 5-sided spinner.
The sides of the spinner are labelled A, B, C, D and E.

Izrah spins the spinner 40 times.



The table shows the number of times the spinner lands on A, on B, on C, on D and on E.

Outcome (letter)	A	B	C	D	E
Frequency	18	13	3	4	2

(a) Is the spinner biased? .....

Use the numbers in the table to explain your answer.

.....

.....

.....

(1)

Thomas spins the spinner once.

(b) Using the information in the table find an estimate for the probability that the spinner will land on E.

.....

(2)

(Total for Question 18 is 3 marks)

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19 (a) Solve $3z = 21$

$z =$ .....

(1)

(b) Solve $y - 10 = 4$

$y =$ .....

(1)

(c) Solve $5x + 6 = 21$

$x =$ .....

(2)

(d) Factorise fully $6ef + 9e^2$

.....

(2)

(Total for Question 19 is 6 marks)

20 Here is a square.

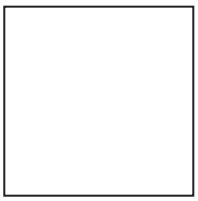


Diagram **NOT** accurately drawn

The square has a perimeter of 24 cm.

Five of these squares are used to make this shape.

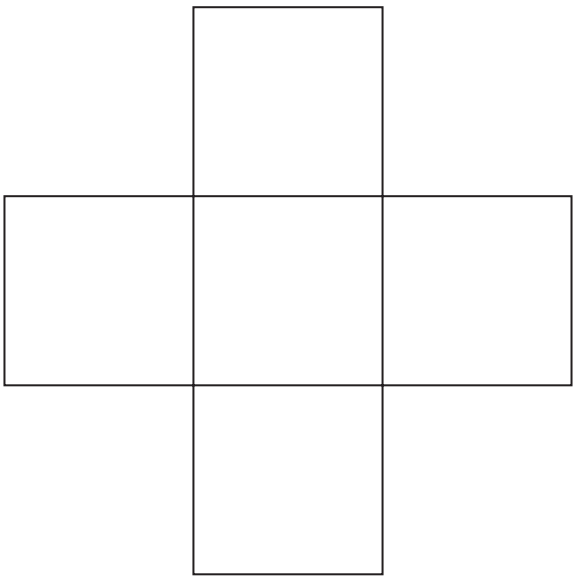


Diagram **NOT** accurately drawn

Work out the perimeter of this shape.

..... cm

(Total for Question 20 is 3 marks)

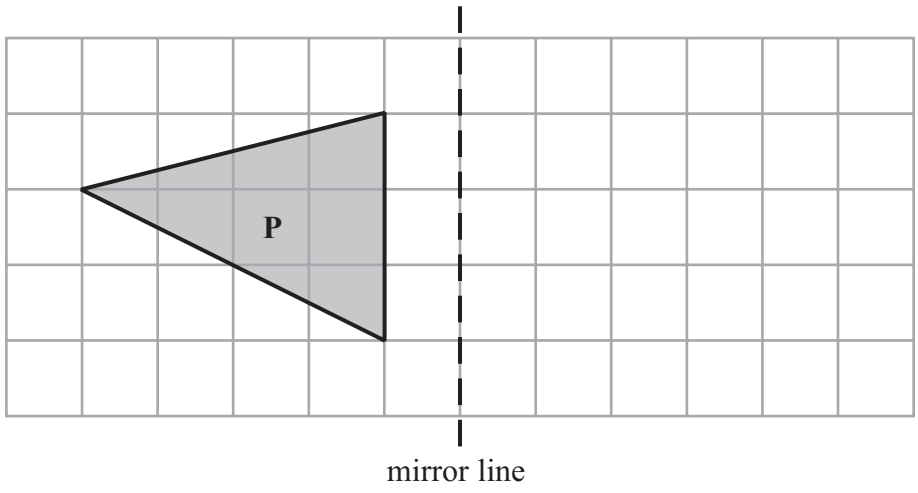
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21 Work out 427×56

.....

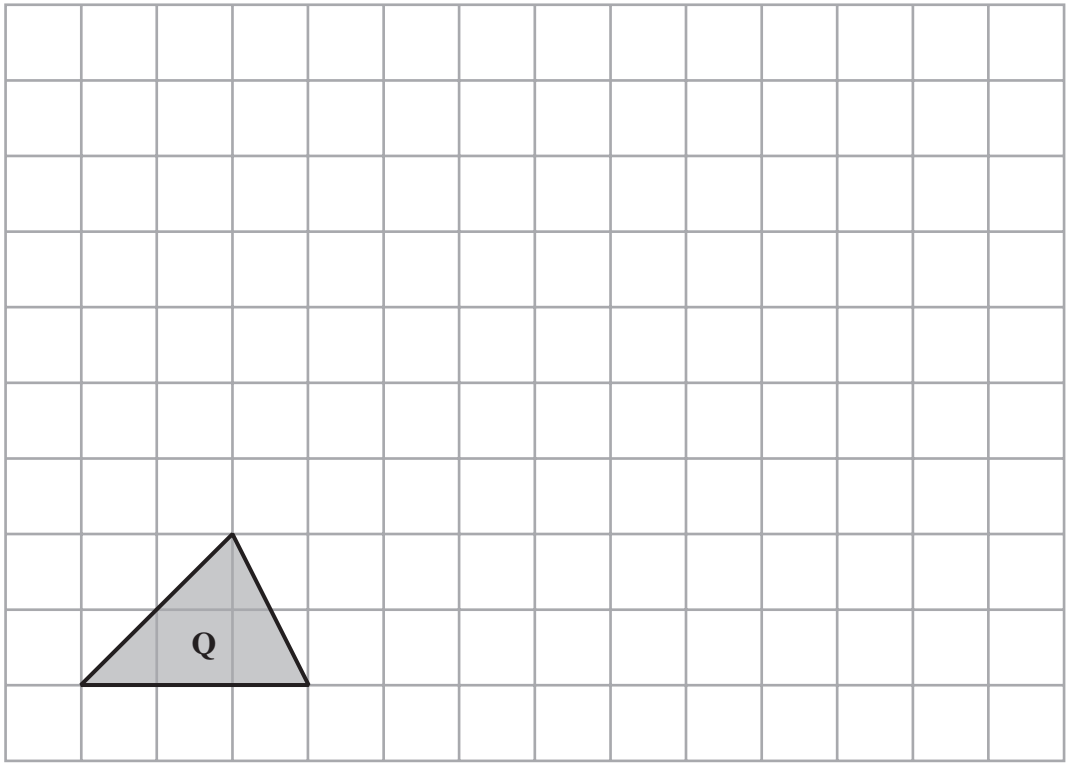
(Total for Question 21 is 3 marks)

22



(a) Reflect shape **P** in the mirror line.

(1)



(b) On the grid, draw an enlargement of shape **Q** with a scale factor of 2

(2)

(Total for Question 22 is 3 marks)

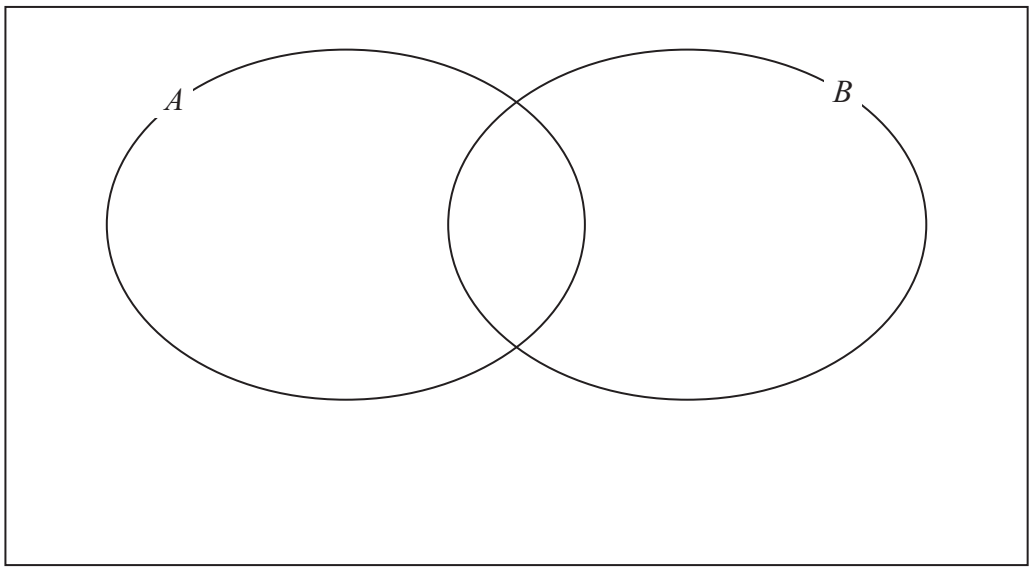
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23 Here is a list of numbers.

30 31 32 33 34 35 36 37 38 39 40

set $A = \{30, 33, 36, 39\}$
set $B = \{31, 33, 35, 37, 39\}$

(a) Write each number from the list in the correct place in the Venn diagram.



(4)

A number is chosen at random from the numbers in the list.

(b) Find the probability that the number is in both set A and set B.

$P(A \cap B) =$ .....

(1)

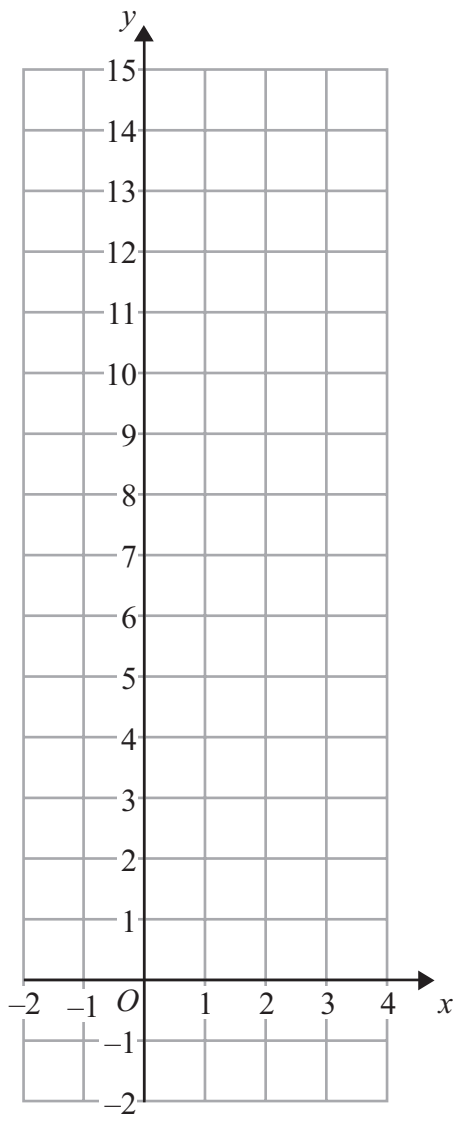
(c) Find the probability that the number is **not** in set A.

$P(A') =$ .....

(1)

(Total for Question 23 is 6 marks)

24 (a) On the grid, draw the graph of $y = 3x + 5$ for values of x from –2 to 3



(3)

*(b) Explain why the point (6, 24) does **not** lie on the line $y = 3x + 5$

(2)

(Total for Question 24 is 5 marks)

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25 Given that

$$124 \times 68 = 8432$$

work out the value of

(a) 680×124

.....

(1)

(b) 1.24×6.8

.....

(1)

(c) 124×34

.....

(1)

(Total for Question 25 is 3 marks)

26 Sophie has a fair 6-sided dice numbered 1, 2, 3, 4, 5 and 6
She also has a fair 4-sided dice numbered 1, 3, 5 and 7

Sophie rolls each dice once.
Each dice lands on a number.
She **adds** the two numbers together to get the score.

(i) Work out the probability that the score will be 12

.....

(ii) Work out the probability that the score will be less than 5

.....

(Total for Question 26 is 5 marks)

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27 Here is a symmetrical shape.

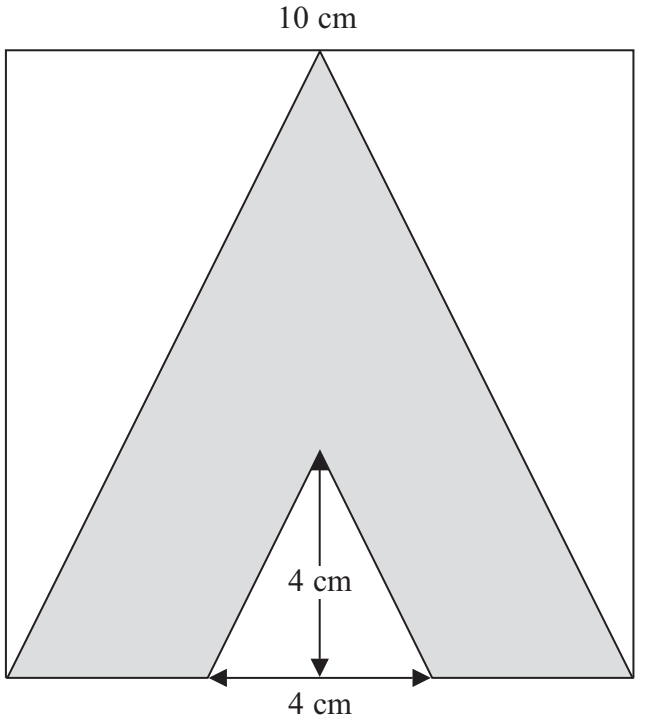


Diagram **NOT** accurately drawn

Work out the area of the shape that is shaded.

.....

(Total for Question 27 is 4 marks)

Turn over for Question 28

***28** The diagram shows a triangle.

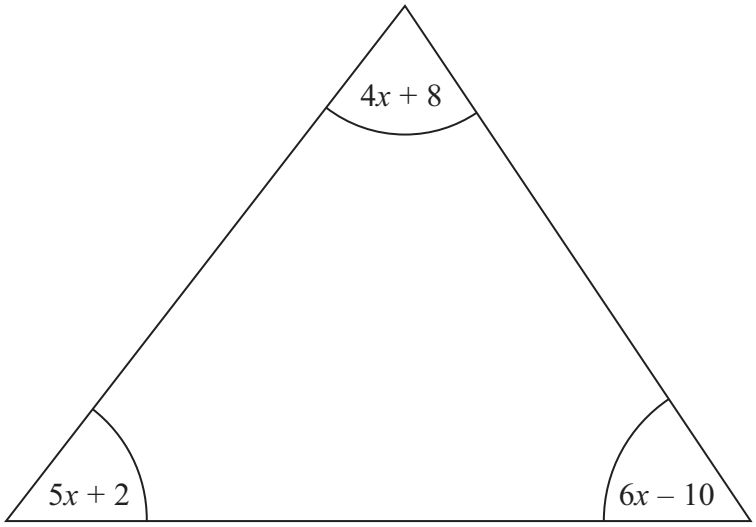


Diagram **NOT** accurately drawn

All the angles are measured in degrees.

Show that the triangle is isosceles.

(Total for Question 28 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

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Mark Scheme (Results)

Summer 2013

GCSE Mathematics Linked Pair Pilot
Methods in Mathematics (2MM01)
Foundation (Non Calculator) Paper 1F

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Summer 2013
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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

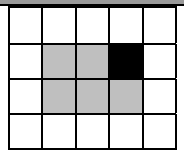
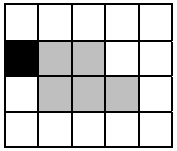
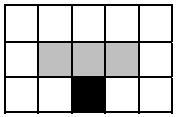
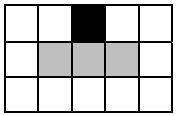
13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Three thousand, five hundred and six	1	B1 accept thirty five hundred and six
	(b)		1425	1	B1 cao
	(c)		83 000	1	B1 cao
	(d)		3.7	1	B1 cao
2	(a)		18 45 53 84 138	1	B1 cao
	(b)		0.56 0.65 5.06 5.6 6.5	1	B1 cao
3	(a)		impossible	1	B1 cao
	(b)		even	1	B1 cao
	(c)		likely	1	B1 cao
4	(a)		Acute angle marked	1	B1
	(b)		Right angle marked	1	B1

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)	367 + 128	495	2	M1 for correct method to add the numbers, evidence of correct carrying used at least once A1 cao
	(b)	15.6 – 4.37	11.23	2	M1 for correct method to subtract the numbers with evidence of borrowing from 6 **or** evidence of counting on from 7 (NB. decimal points must be correctly lined up) A1 cao
	(c)	3.8 4× **or** 3.8+3.8+3.8+3.8	15.2	2	M1 for valid method to multiply 38 by 4 (ignore decimals, condone one multiplication error) **or** the digits 152 in the answer **or** 3.8+3.8+3.8+3.8 A1 cao
	(d)		2	1	B1 cao
	(e)		− 30	1	B1 cao

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		 	1	B1 One extra square shaded to make a shape with rotational symmetry order 2
	(b)		 	1	B1 One extra square shaded to make a shape with one line of symmetry only

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
7			0.6 is bigger than $\frac{2}{5}$	3	M1 for 0.4 **or** 40% **or** fraction equivalent to $\frac{2}{5}$ with denominator =10,15,20... **OR** 60% **or** $\frac{3}{5}$ **or** a fraction equivalent to $\frac{3}{5}$ with denominator = 10,15,20... A1 for two comparable figures eg. (0.6) ,0.4 **or** 40% , 60% **or** $\frac{3}{5}, \left(\frac{2}{5}\right)$ **or** $\frac{6}{10}, \frac{4}{10}$ etc C1 (dep on M1) ft for correct statement from their figures **OR** M1 for a correct method involving shading **or** calculation Eg. drawing a rectangle 2 by 5 and shading 6 squares or 4 squares **or** correct method to find $\frac{2}{5}$ or 0.6 of a number A1 correct comparable figures. Eg. Two 2×5 rectangles, one with 4 squares shaded, one with 6 squares shaded **or** $\frac{2}{5} \times 20 = 8$ **and** $0.6 \times 20 = 12$ C1 (dep on M1) ft for correct statement from their figures **OR** M1 $\frac{2}{5}$ < half **or** 0.6 > half A1 $\frac{2}{5}$ < half **and** 0.6 > half C1 (dep on M1) ft for correct statement from their figures

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(i)		Equilateral or isosceles	2	B1 use professional judgement for spelling
	(ii)		Right angled or scalene		B1 use professional judgement for spelling
9		.....11, 13, 15, 17, 19, 21,..... .....15, 18, 21, ...	Any odd multiple of 3 greater than 14	3	M1 for finding the next number in either sequence M1 for finding the next number in both sequences **or** extending either sequence by two more terms A1 15 **or** any odd multiple of three >14
10	(a)		10	1	B1 cao
	(b)		35	1	B1 cao
	(c)		8	1	B1 cao
11	(i)		33 and 17	4	B1 both 17 and 33 needed
	(ii)		6, 16 or 24		B1
	(iii)		24		B1 cao
	(iv)		16		B1 cao

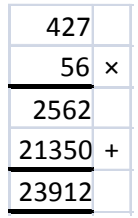
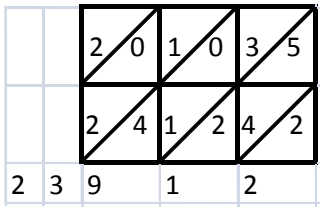
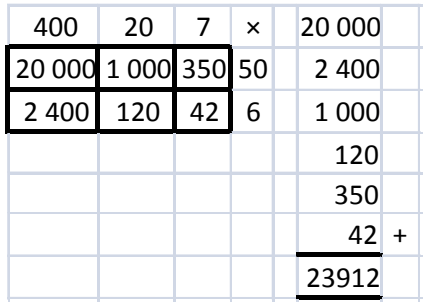
Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*12		14 + 19 = 33 57 – 29 = 28 (or -28) 9 × 4 = 36	the **product** of 9 and 4 has the **greatest** value	3	M1 for evidence of one correct operation Eg. 14 + 19 **or** 33 **OR** 57 – 29 **or** 28 **or** 29 – 57 **or** –28 **OR** 9 × 4 **or** 36 A1 33, 28 (or –28) **and** 36 C1 (dep on M1) ft for a statement identifying the correct calculation (not the biggest answer) from three calculated values
13	(a)		(3, 2)	1	B1 cao
	(b)		point plotted at (–2,1)	1	B1 cao
14	(a)		$\frac{3}{5}$	1	B1 cao
	(b)		$3\frac{5}{8}$	1	B1 cao
	(c)	$\frac{4}{9}+\frac{3}{9}$	$\frac{7}{9}$	2	M1 $\frac{4}{9}+\frac{3}{9}$ or another common denominator used with at least one correct numerator eg $\frac{"8"}{18}+\frac{6}{18}$ or $\frac{8}{18}+\frac{"6"}{18}$ A1 oe

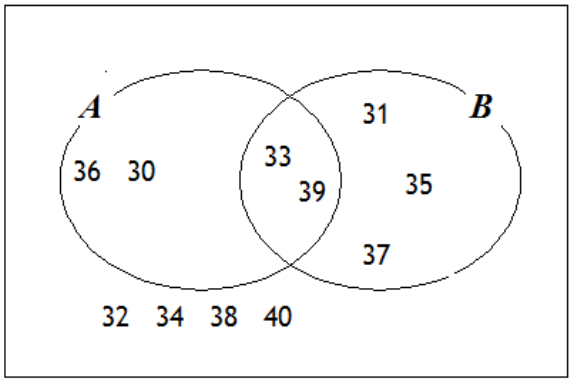
Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		37	1	B1 cao
	(b)		reason	1	B1 for a correct reason Eg. the sequence contains only odd numbers and 200 is even ; all numbers in the sequence end in 1, 3, 5, 7, 9 ; sight of 197 and 201 with statement; Use of $4n+5$ to show that 200 is not in sequence
16	(a)		$\frac{1}{4}$	1	B1 0.25 or $\frac{1}{4}$ oe
	(b)		(red, blue) (red,green) (red,yellow) (blue,green) (blue,yellow) (green,yellow)	2	M1 for at least 3 correct pairs A1 for 6 correct pairs, no extras or repeats
17	(a)		$2w$	1	B1 oe
	(b)		$5de$	1	B1 oe simplified algebraic form
	(c)		$7a + 2b$	2	B2 for $7a + 2b$ oe (B1 for $7a$ or $2b$ seen)

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)		reason	1	B1 Eg. **yes** and any sentence that indicates that the number of outcomes for each letter is not evenly distributed **or** **no** and any sentence that indicates that the number of outcomes for each letter could have come from a fair spinner as there are only 40 outcomes **or** **don't know** and any sentence that indicates that there are insufficient outcomes (only 40) to be able to tell or don't know if the sides of the spinner are the same length
	(b)		$\frac{2}{40}$	2	M1 for $\frac{2}{n}$ for $n > 2$ or $\frac{n}{40}$ for $n < 40$ A1 $\frac{2}{40}$ oe

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)		7	1	B1 cao
	(b)		14	1	B1 cao
	(c)	$5x + 6 - 6 = 21 - 6$ **or** $x + \frac{6}{5} = \frac{21}{5}$	3	2	M1 for $5x = 15$ or $5x = 21 - 6$ **or** clear intention to subtract 6 from both sides **or** clear intention to divide all terms by 5, A1 cao
	(d)		$3e(2f + 3e)$	2	M1 $3(2ef + 3e^2)$ or $e(6f + 9e)$ A1 $3e(2f + 3e)$ cao

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
20			72	3	M1 24÷4 or 6 seen M1 “6”×12 A1 cao **OR** M1 24×5 or 120 or 24×2 or 48 M1 “120”–“48” A1 cao **OR** M1 24÷4×3 or 18 seen M1 “18”×4 A1 cao **OR** M2 24×3 A1 cao

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
21		  	23912	3	M1 for a complete method with relative place value correct. Condone 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation. A1 cao M1 for a complete grid with not more than 1 multiplication error, addition not necessary M1 (dep) for addition of all the appropriate elements of the calculation A1 cao M1 for sight of a complete partitioning method, condone 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation. A1 cao

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
22	(a)	see last page	correct reflection drawn	1	B1
	(b)	see last page	correct enlargement drawn	2	M1 for drawing at least one side double in length A1 fully correct enlargement (drawn in any orientation) SC B1 correct enlargement scale factor 3 or correct enlargement scale factor 4
23	(a)			4	B1 33 and 39 and no other numbers placed in the intersection B1 30 and 36 in set *A* or 31, 35 and 37 in set *B* B1 at least two of 32, 34, 38 40 placed correctly B1 fully correct diagram
	(b)		$\frac{2}{11}$ oe	1	B1 ft from candidate's Venn diagram
	(c)		$\frac{7}{11}$ oe	1	B1 ft from candidate's Venn diagram

<table>
<tr><th colspan="5">Paper: 5MM1F_01</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>24</td><td>(a)</td><td>$y = 3x + 5$
<table><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>-1</td><td>2</td><td>5</td><td>8</td><td>11</td><td>14</td></tr></table></td><td>Correct line from (-2,-1) to (3,14)</td><td>3</td><td>(Table of values / calculation of values)
M1 for at least 2 correct attempts to find points by substituting values of x.
M1 ft for plotting at least 2 of their points (any points plotted from their table must be correctly plotted)
A1 for correct line between $x = –2$ and $x = 3$

(No table of values)
M1 for at least 2 correct points with no more than 2 incorrect points
M1 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 3x + 5$ drawn
A1 for correct line between $x = –2$ and $x = 3$

(Use of y=mx+c)
M1 for line drawn with gradient of 3 OR line drawn with a y intercept of 5
M1 for line drawn with gradient of 3 AND line drawn with a y intercept of 5
A1 for correct line between $x = –2$ and $x = 3$

SC : B2 for the correct line from $x = 0$ to $x = 3$</td></tr>
<tr><td></td><td>(*b)</td><td>$3 \times 6 + 5$
$= 18 + 5$
or
$24 – 5=19$
$19 \div 3$</td><td>Correct explanation</td><td>2</td><td>M1 $3 \times 6 + 5$ or “18” + 5 or (6, 23)
C1 for 23 seen and correct conclusion
or
M1 $24 – 5$ or “19” $\div 3$
C1 for $\frac{19}{3}$ oe or 6.3... seen and correct conclusion</td></tr>
<tr><td>25</td><td>(a)</td><td></td><td>84 320</td><td>1</td><td>B1 cao</td></tr>
<tr><td></td><td>(b)</td><td></td><td>8.432</td><td>1</td><td>B1 cao</td></tr>
<tr><td></td><td>(c)</td><td></td><td>4216</td><td>1</td><td>B1 cao</td></tr>
</table>

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
26	(i)	+ | **1** **2** **3** **4** **5** **6** **1** | 2 3 4 5 6 7 **3** | 4 5 6 7 8 9 **5** | 6 7 8 9 10 11 **7** | 8 9 10 11 12 13 **or** $\frac{1}{4}\times\frac{1}{6}$	$\frac{1}{24}$	3	M1 for identifying 5 and 7 **or** 5 + 7 (= 12) M1 for 24 seen OR an attempt to get the 24 outcomes or an attempt at a sample space or a list of possibilities or a list of ordered pairs [at least 12 correct; outcomes , possibilities, ordered pairs must be shown (ignore incorrect extras)] A1 for $\frac{1}{24}$ oe **OR** M2 for $\frac{1}{4}\times\frac{1}{6}$ (M1 for $\frac{1}{4}$ or $\frac{1}{6}$ seen) A1 for $\frac{1}{24}$ oe
	(ii)		$\frac{4}{24}=\frac{1}{6}$	2	M1 ft from their ordered list from part (i) for identifying at least one possible score from; 1+1(=2), 1+2(=3), 1+3(=4), 3+1(=4), condone the inclusion of pairs reversed [accept the inclusion of 1+4 or 4+1 (=5) as a misread] [accept an answer of $\frac{5}{24}$, for M1, only if the 5 outcomes are selected in either part (i) or part (ii)] A1 for $\frac{4}{24}$ oe

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
27			$42cm^2$	4	M1 for a correct method to find area of one triangle M1 for a fully correct method to find the shaded area A1 cao B1 (indep) for cm^2

Paper: 5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*28			"**two** angles are **equal** so the triangle is **isosceles**"	5	M1 for $6x - 10 + 4x + 8 + 5x + 2$ **or** $15x$ M1 for $6x - 10 + 4x + 8 + 5x + 2 = 180$ **or** $15x = 180$ **or** $(x =)\ 180 \div 15$ A1 $x = 12$ M1 (ft from '12' if M2 scored) for $5\times$'12'$+2$ **or** $6\times$'12'-10 **or** $62(^o)$ **or** $4\times$'12'$+8$ **or** $56(^o)$ C1 both base angles as 62 **and two** angles are **equal** so the triangle is **isosceles** NB. $x = 12$ with no working scores M0M0A0 ; correct value of x from clear trial and improvement could gain M1M1A1 **OR** M1 $5x + 2 = 6x - 10$ **or** $2 + 10 = 6x - 5x$ A1 $x = 12$ M1 $5\times12+2$ **or** $6\times12-10$ **or** $62(^o)$ **or** $4\times12+8$ **or** $56(^o)$ M1 checking their angles add to 180^o, "62"+"62"+"56"=180 C1 both base angles as 62 **and two** angles are **equal** so the triangle is **isosceles** **OR** M1 $4x + 8 = 5x + 2$ oe or $4x + 8 = 6x - 10$ A1 $x = 6$ **or** $x = 9$ M1 (dep) for substituting 'x' into one of the angles oe M1 for showing their angles do not sum to 180^o C0

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Centre Number	Candidate Number

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Monday 12 November 2012 – Morning
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P40676A

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6/6/7/

P 4 0 6 7 6 A 0 1 2 4

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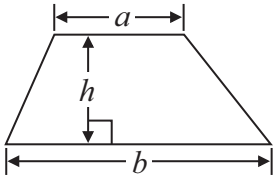
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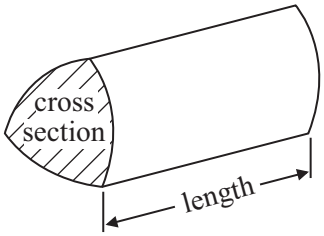
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 (a) Write the number **four thousand, seven hundred and thirty six** in figures.

.....

(1)

(b) Write the number 23 584 correct to the nearest hundred.

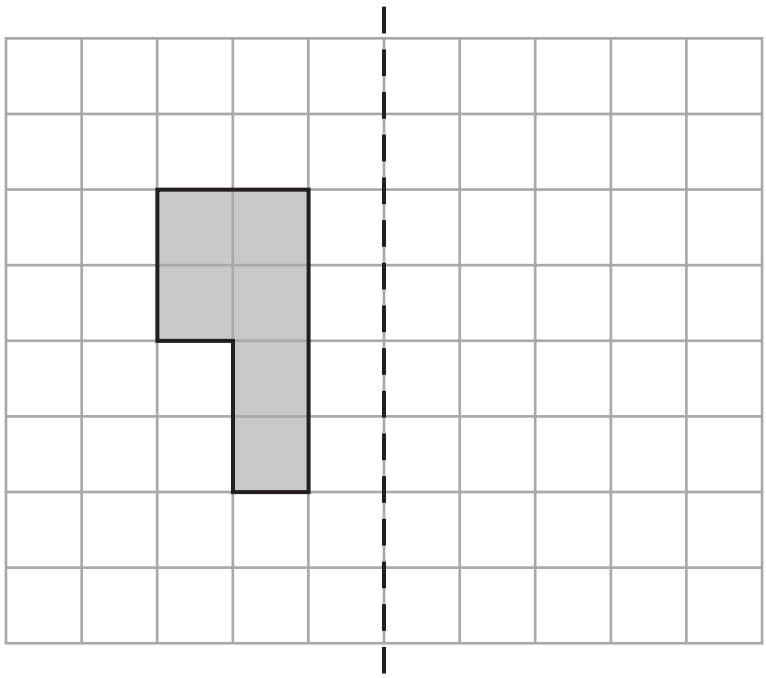
.....

(1)

(Total for Question 1 is 2 marks)

---

2 The shaded shape is drawn on a centimetre square grid.



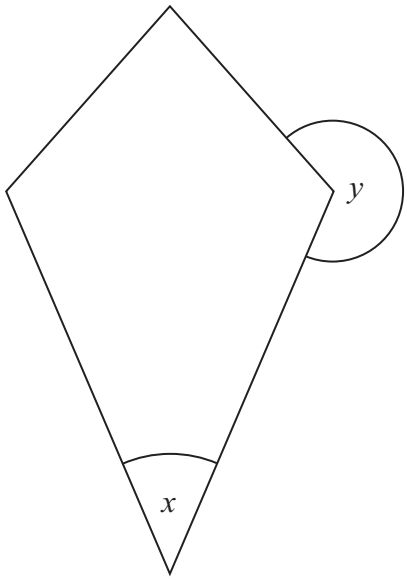
Mirror line

Reflect the shaded shape in the mirror line.

(Total for Question 2 is 2 marks)

---

3 The diagram shows a quadrilateral.



(a) What is the mathematical name for this quadrilateral?

.....

(1)

(b) Write down the type of angle shown by the letter

(i) x

.....

(ii) y

.....

(2)

(Total for Question 3 is 3 marks)

---

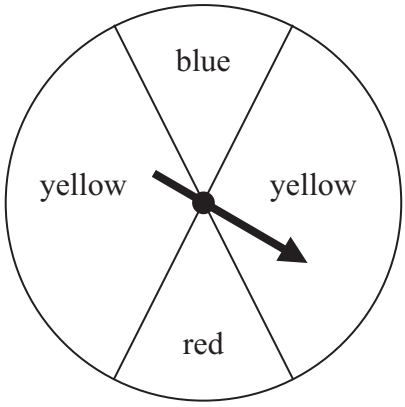
4 Write the fraction $\frac{18}{24}$ in its simplest form.

.....

(Total for Question 4 is 2 marks)

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5 Here is a spinner.



The arrow on the spinner can stop on blue or on yellow or on red.
Amy is going to spin the arrow once.

impossible	unlikely	even	likely	certain

Choose a word from the box to best describe the probability

(a) that the arrow will stop on yellow,

.....

(1)

(b) that the arrow will stop on red,

.....

(1)

(c) that the arrow will stop on pink.

.....

(1)

(Total for Question 5 is 3 marks)

6 Here is a list of 7 numbers.

7 8 9 16 17 18 24

From the list,

(a) write down a square number

.....

(1)

(b) write down a multiple of 6

.....

(1)

(c) write down a cube number.

.....

(1)

(Total for Question 6 is 3 marks)

---

7 (a) Work out $3 \times 4 - 2$

.....

(1)

(b) Work out $40 \div (14 - 6)$

.....

(1)

(c) Work out $15 + 10 \div 5$

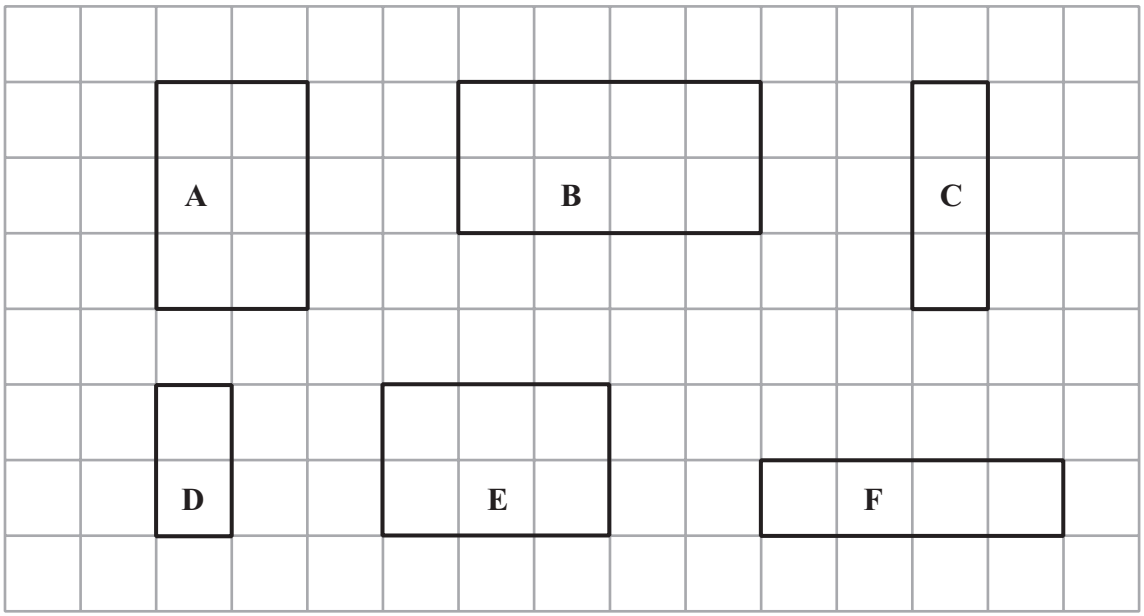
.....

(1)

(Total for Question 7 is 3 marks)

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8 Here are 6 rectangles drawn on a square grid.

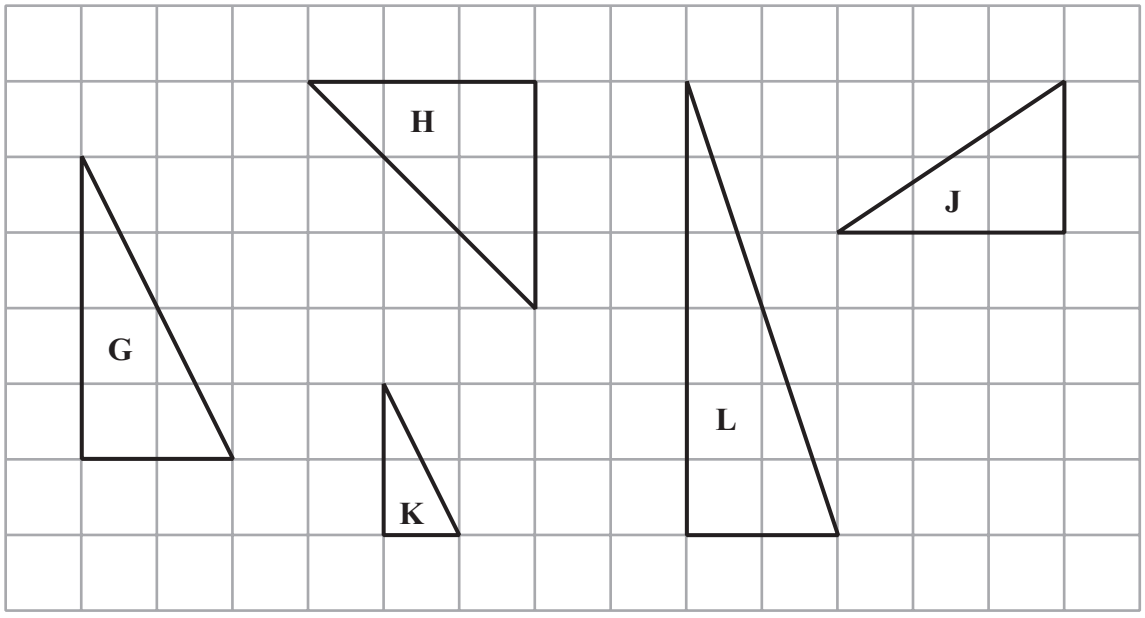


(a) Write down the letters of the **two** congruent rectangles.

..... and .....

(1)

Here are 5 triangles drawn on a square grid.



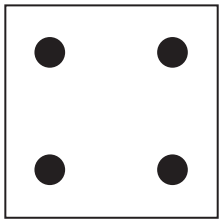
(b) Write down the letters of the **two** similar triangles.

..... and .....

(1)

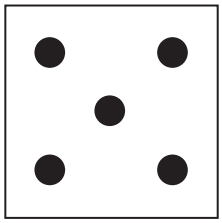
(Total for Question 8 is 2 marks)

9 (a) Draw all the lines of symmetry on this diagram.



(2)

(b) This shape has rotational symmetry.



Write down the order of rotational symmetry.

.....

(1)

(Total for Question 9 is 3 marks)

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10 (a) Work out 4×300

.....

(1)

(b) Work out $64 \div 4$

.....

(1)

(c) Work out $-8 + 10$

.....

(1)

(d) Work out 561×34

.....

(3)

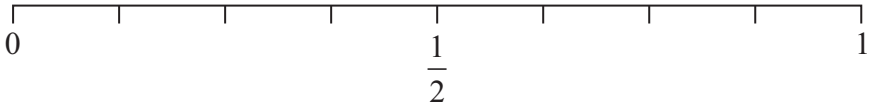
(Total for Question 10 is 6 marks)

11 There are 8 beads in a bag.

4 beads are red.
1 bead is white.
3 beads are blue.

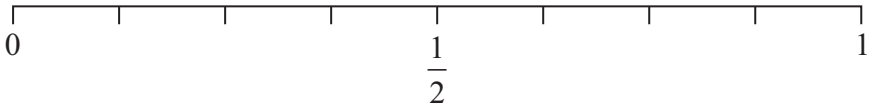
Jane takes at random a bead from the bag.

(a) On the probability scale, mark with a cross (×) the probability that Jane takes a white bead.



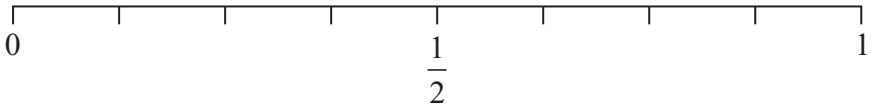
(1)

(b) On the probability scale, mark with a cross (×) the probability that Jane takes a green bead.



(1)

(c) On the probability scale, mark with a cross (×) the probability that Jane takes a red bead.

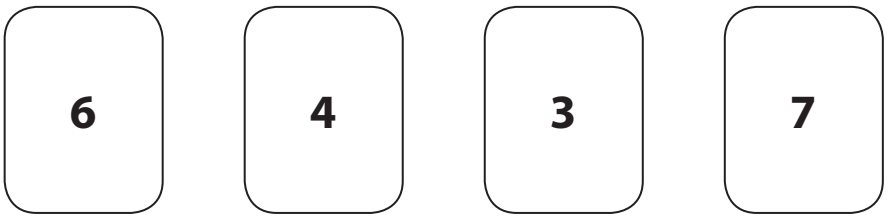


(1)

(Total for Question 11 is 3 marks)

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12 Here are four cards.
There is a number on each card.



(a) Use each of the four cards once to make the **smallest** 4 digit number.

.....

(1)

(b) Use each of the four cards once to make the **largest** 4 digit **even** number.

.....

(1)

(c) Use two cards to make a fraction equivalent to $\frac{2}{3}$

.....

(1)

(d) Use two cards to make a fraction greater than $\frac{1}{2}$ **and** less than 1

.....

(1)

(Total for Question 12 is 4 marks)

13 Pippa rolls an ordinary fair dice once.

(a) Write down the probability that she gets

(i) the number 3

.....

(ii) an even number

.....

(iii) a number greater than 4

.....

(3)

Pete rolls an ordinary fair dice once and throws a fair coin once.

(b) (i) Write down all the possible outcomes.

.....

.....

.....

(ii) Write down the probability that Pete gets a 6 and a Head.

.....

(3)

(Total for Question 13 is 6 marks)

14 (a) Write these numbers in order of size.
Start with the smallest number.

6 –3 17 –5 2

.....

(1)

(b) Write these numbers in order of size.
Start with the smallest number.

0.67 0.078 0.6 0.75 0.705

.....

(1)

(c) Write these numbers in order of size.
Start with the smallest number.

$\frac{1}{2}$ $\frac{3}{10}$ $\frac{3}{4}$ $\frac{2}{5}$

.....

(2)

(Total for Question 14 is 4 marks)

15 (a) Simplify $b + b + b + b$

.....

(1)

(b) Simplify $3 \times c \times d$

.....

(1)

(c) Simplify $4h - 2r + 3h + 7r$

.....

(2)

(Total for Question 15 is 4 marks)

---

16 (a) Work out $\frac{3}{8} + \frac{2}{8}$

.....

(1)

(b) Work out $\frac{7}{10} - \frac{3}{5}$

.....

(2)

(c) Work out $\frac{5}{8} \div \frac{3}{4}$

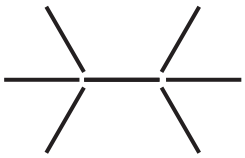
.....

(2)

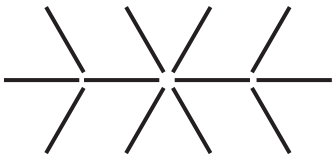
(Total for Question 16 is 5 marks)

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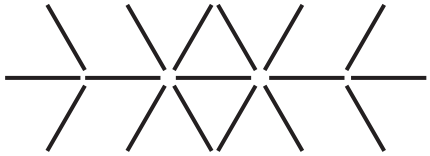
17 Here is a sequence of patterns made from sticks.



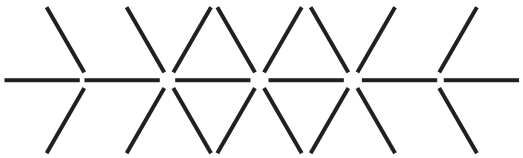
Pattern number 1



Pattern number 2



Pattern number 3



Pattern number 4

(a) Complete the table to show the number of sticks in each pattern.

Pattern number	1	2	3	4	5
Number of sticks	7	12	17	22	.....

(1)

(b) Find the number of sticks in Pattern number 8

.....

(1)

(c) Find an expression in terms of n for the number of sticks in Pattern number n.

.....

(2)

Ali has 60 sticks.
She wants to use as many sticks as possible to make a Pattern number.

(d) What is the largest Pattern number she can make?

.....

(2)

(Total for Question 17 is 6 marks)

18 (a) Solve $x + 4 = 16$

$x =$ .....

(1)

(b) Solve $5b = 30$

$b =$ .....

(1)

(c) Solve $7y - 5 = 16$

$y =$ .....

(2)

(Total for Question 18 is 4 marks)

19 Which is the larger, 2^6 or 6^2?

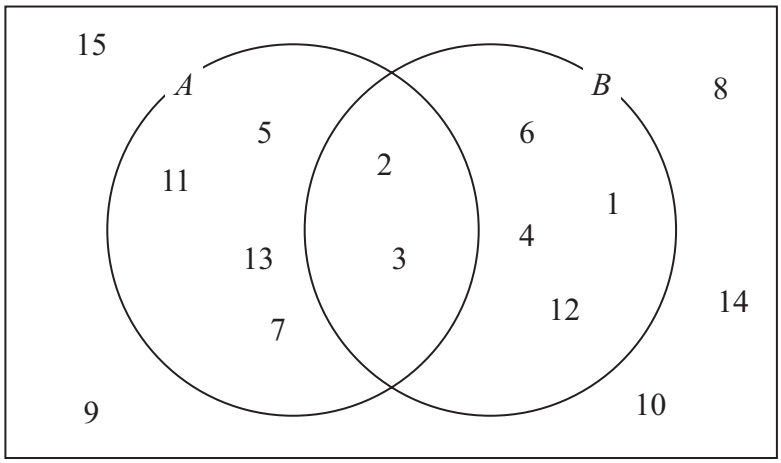
You must show your working.

.....

(Total for Question 19 is 3 marks)

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20 The Venn diagram shows the numbers from 1 to 15



(a) Use **one** word to complete this sentence.

All the numbers in set B are ..... of 12

(1)

(b) Write down the numbers that are in set A **and** also in set B.

.....

(1)

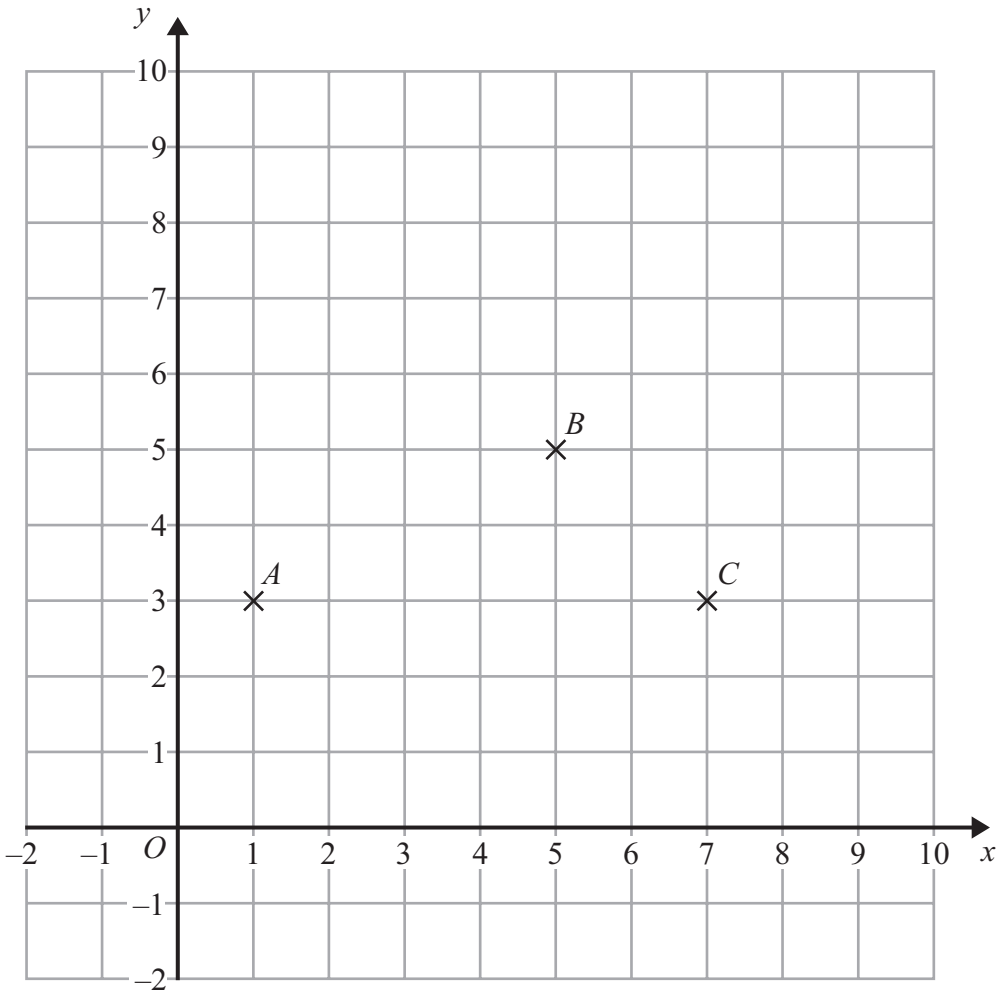
(c) Find P(A')

.....

(2)

(Total for Question 20 is 4 marks)

21



(a) Write down the coordinates of point C.

(..... , ...)

(1)

(b) Find the coordinates of point D so that $ABCD$ is a parallelogram.

(..... , ...)

(1)

E is another point on the grid.
The midpoint of AE has coordinates (2, 6)

(c) Find the coordinates of point E.

(..... , ...)

(2)

(Total for Question 21 is 4 marks)

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22 Here is a rectangle.

Diagram **NOT** accurately drawn



The rectangle has a width of 4 cm.
It has a perimeter of 28 cm.

(a) Work out the area of the rectangle.

..... cm^2

(3)

A square has an area of 81 cm^2.

(b) Work out the perimeter of the square.

..... cm

(3)

(Total for Question 22 is 6 marks)

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23 Ramesh throws a biased coin.
The probability that the coin will land on a Head is 0.37

(a) Write down the probability that the coin will land on a Tail.

.....

(1)

Ramesh is going to throw the coin 500 times.

(b) Work out an estimate for the number of times that the coin will land on a Head.

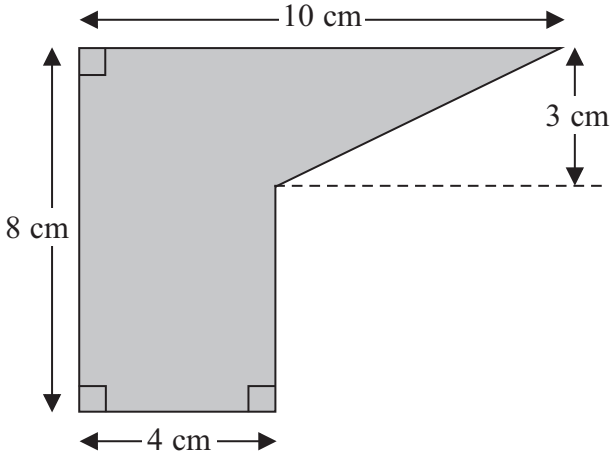
.....

(2)

(Total for Question 23 is 3 marks)

***24** Work out the area of the shaded shape.

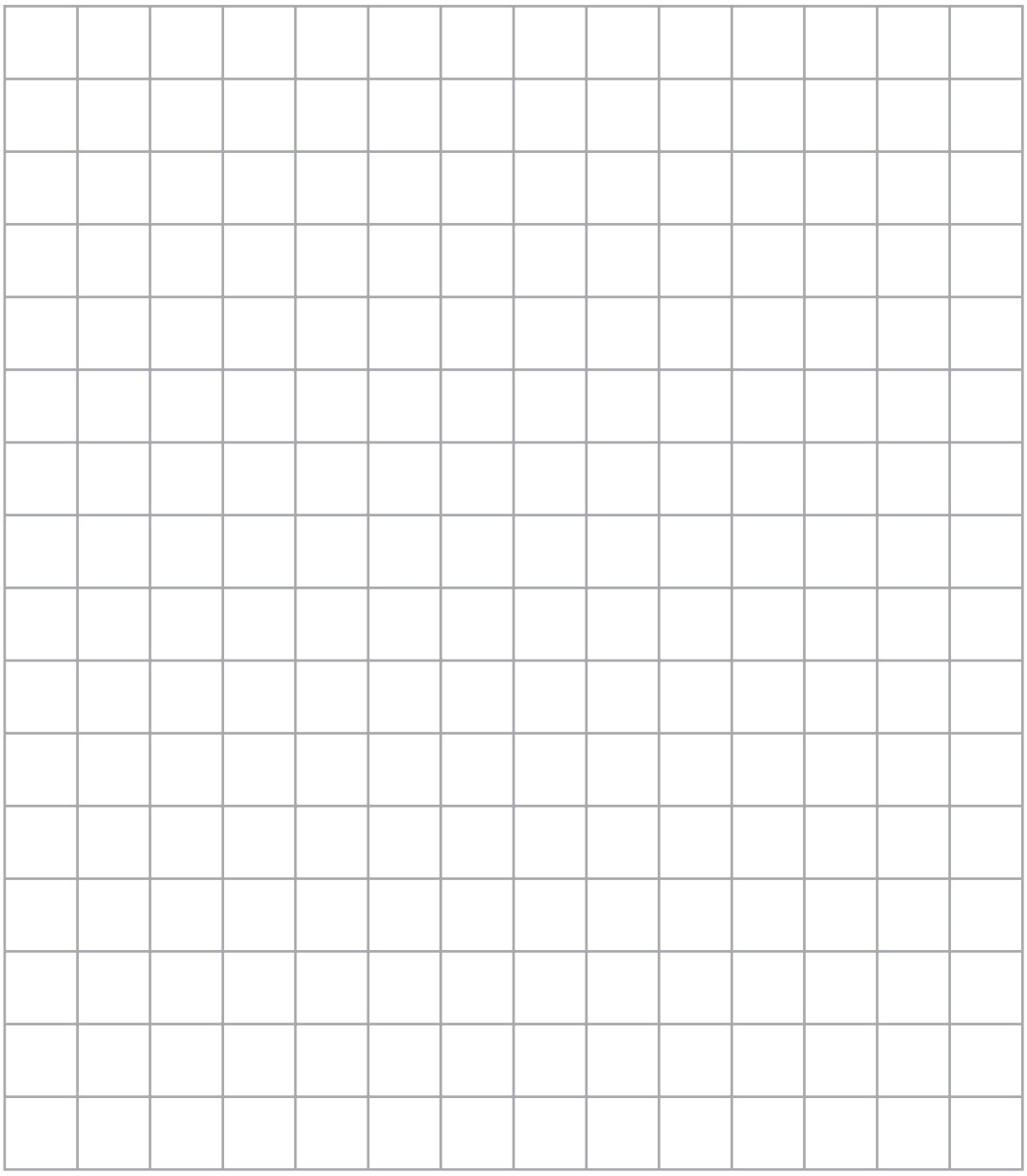
Diagram **NOT** accurately drawn



(Total for Question 24 is 4 marks)

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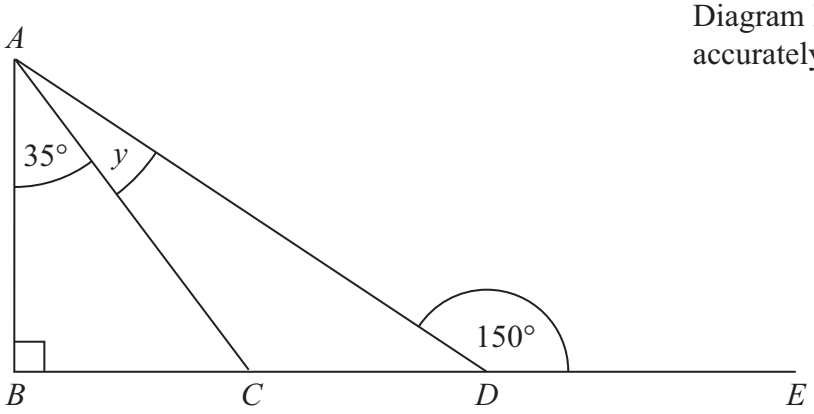
25 On the grid, draw the graph of $y = 2x + 3$ for values of x from -2 to 2



(Total for Question 25 is 4 marks)

*26

Diagram **NOT** accurately drawn



ABC and *ABD* are right-angled triangles.
BCDE is a straight line.

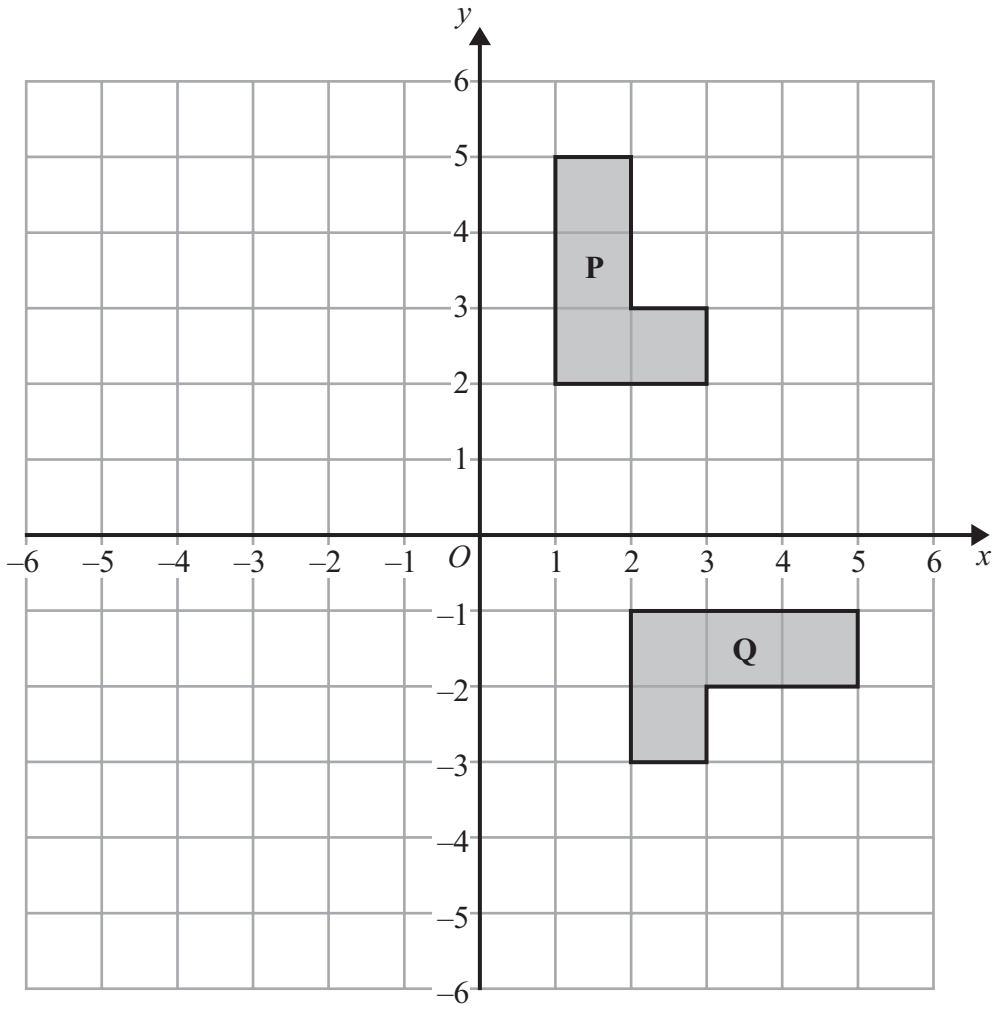
Angle *BAC* = 35°
Angle *ADE* = 150°

Work out the size of angle *y*.
Give reasons for your answer.

(Total for Question 26 is 4 marks)

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27



Describe fully the **single** transformation that maps shape **P** onto shape **Q**.

.....

.....

(Total for Question 27 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

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Mark Scheme (Results)

November 2012

GCSE Mathematics Linked Pair Pilot
Methods in Mathematics (2MM01)
Foundation (Non Calculator) Paper 1F

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

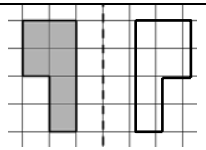
12 Parts of questions

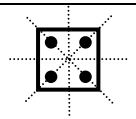
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		4736	1	B1 cao
	(b)		23 600	1	B1 cao
2			Correct shape in correct position	2	B2 for correct shape in correct position (B1 for a correct reflection in a line parallel to the mirror line)
3	(a)		kite	1	B1
	(b)(i)		acute	2	B1
	(b)(ii)		reflex		B1
4			$\frac{3}{4}$	2	M1 for $\frac{9}{12}$ or $\frac{6}{8}$ or for an attempt to divide numerator and denominator by a common factor A1 $\frac{3}{4}$ cao
5	(a)		Likely	1	B1
	(b)		Unlikely	1	B1
	(c)		Impossible	1	B1

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		9 or 16	1	B1
	(b)		18 or 24	1	B1
	(c)		8	1	B1
7	(a)		10	1	B1 cao
	(b)		5	1	B1 cao
	(c)		17	1	B1 cao
8	(a)		A, E	1	B1 cao
	(b)		G, K	1	B1 cao
9	(a)		4 correct lines	2	M1 for 1 correct line with no incorrect lines A1 for 4 correct lines with no errors
	(b)		4	1	B1 cao

5MM1F_01

Question		Working	Answer	Mark	Notes
10	(a)		1200	1	B1 cao
	(b)		16	1	B1 cao
	(c)		2	1	B1 cao
	(d)	561 34 2244 16830 19074 **5** **6** **1** 1 | 1/5 | 1/8 | 3/ | **3** 9 | 2/0 | 2/4 | 4/ | **4** 0 7 4 **500** **60** **1** **30** 15000 1800 30 **4** 2000 240 4 15000+1800+30+2000+240+4	19074	3	M1 for complete method with relative place value correct. Condone 1 multiplication error, addition not necessary. OR M1 for a complete grid. Condone 1 multiplication error, addition not necessary. OR M1 for sight of a complete partitioning method, condone 1 multiplication error. Final addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation A1 for 19074 cao (SC B1 for addition of 34 lots of 561)

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		x marked at $\frac{1}{8}$	1	B1 for x at $\frac{1}{8}$, within tolerance on overlay
	(b)		x marked at 0	1	B1 for x at 0, within tolerance on overlay
	(c)		x marked at $\frac{1}{2}$	1	B1 for x at $\frac{1}{2}$, within tolerance on overlay
12	(a)		3467	1	B1 cao
	(b)		7634	1	B1 cao
	(c)		$\frac{4}{6}$	1	B1 for $\frac{4}{6}$ cao
	(d)		$\frac{3}{4}$ or $\frac{4}{6}$ or $\frac{4}{7}$ or $\frac{6}{7}$	1	B1 for $\frac{3}{4}$ or $\frac{4}{6}$ or $\frac{4}{7}$ or $\frac{6}{7}$

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)(i)		$\frac{1}{6}$	3	B1 for $\frac{1}{6}$ oe
	(a)(ii)		$\frac{3}{6}$		B1 for $\frac{3}{6}$ oe
	(a)(iii)		$\frac{2}{6}$		B1 for $\frac{2}{6}$ oe
	(b)(i)		H1, H2, H3, H4, H5, H6 T1, T2, T3, T4, T5, T6	3	M1 for any 6 different combinations A1 for all 12 correct combinations seen with no incorrect combinations, ignore duplicates
	(b)(ii)		$\frac{1}{12}$		B1 for $\frac{1}{12}$ or ft from (b)(i)
14	(a)		-5, -3, 2, 6, 17	1	B1 cao
	(b)		0.078, 0.6, 0.67, 0.705, 0.75	1	B1 cao
	(c)	$\frac{18}{60}, \frac{24}{60}, \frac{30}{60}, \frac{45}{60}$ Or 0.3, 0.4, 0.5, 0.75 or 30%, 40%, 50%, 75%	$\frac{3}{10}, \frac{2}{5}, \frac{1}{2}, \frac{3}{4}$	2	M1 for attempt to convert all numbers to equivalent fractions or decimals or percentages A1 cao (SC B1 for only one fraction in wrong position if M0 scored)

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		$4b$	1	B1 cao
	(b)		$3cd$	1	B1 cao
	(c)		$7h + 5r$	2	B2 cao (B1 for $7h$ or $5r$)
16	(a)		$\frac{5}{8}$	1	B1 for $\frac{5}{8}$ oe
	(b)	$\frac{7}{10} - \frac{6}{10}$	$\frac{1}{10}$	2	M1 for a correct common denominator and at least one fraction correct (must be $\frac{6}{10}$ if 10 used as common denominator) A1 for $\frac{1}{10}$ oe
	(c)	$\frac{5}{8} \times \frac{3}{4}$	$\frac{20}{24}$	2	M1 for $\times \frac{4}{3}$ A1 for $\frac{20}{24}$ oe

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
17	(a)		27	1	B1 cao
	(b)		42	1	B1 cao
	(c)		$5n + 2$	2	B2 for $5n + 2$ (oe, including un-simplified) (B1 for $5n + k$, $k \neq 2$ or k is absent, or $n = 5n + 2$)
	(d)	$60 - 2 = 58$ $58 \div 5 = 11.6$ (or 11 r3)	11	2	M1 for $(60 - 2) \div 5$ ft evidence of using formula from part (c) or repeated addition of 5 (at least 3) or 57 seen A1 for 11 cao
18	(a)		12	1	B1 cao
	(b)		6	1	B1 cao
	(c)	$7y = 16 + 5$	3	2	M1 for attempt to rearrange equation eg + 5 on both sides or $7y = 16 + 5$ oe A1 for 3 cao
19		$2^6 = 64$ $6^2 = 36$ $64 > 36$	2^6	3	B1 for $6^2 = 36$ M1 for $2 \times 2 \times 2 \times 2 \times 2 \times 2$ (= 64) C1 for 36 and 64 with 2^6 (or 64) clearly identified

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)		Factors	1	B1 cao
	(b)		2, 3	1	B1 cao
	(c)		$\frac{9}{15}$	2	M1 for $\frac{n}{15}$ where n is integer and $n < 15$ or $\frac{9}{n}$ where n is integer and $n > 9$ A1 for $\frac{9}{15}$ oe
21	(a)		(7, 3)	1	B1 cao
	(b)		(3, 1) or (-1, 5) or (11, 5)	1	B1 for (3, 1) or (-1, 5) or (11, 5)
	(c)		(3, 9)	2	M1 for correct point *E* plotted or $3 + 2(6 - 3)$ or $1 + 2(2 - 1)$ A1 for (3, 9) cao (SC B1 for (3, *m*) where $m \neq 9$ or (*n*, 9) where $n \neq 3$)
22	(a)	$28 - (2 \times 4) = 20$ $20 \div 2 = 10$ $4 \times 10 = 40$	40	3	M1 for $(28 - 2 \times 4)/2$, can be implied by 10 marked on rectangle M1 (dep) for '10' × 4 A1 for 40 cao
	(b)	$\sqrt{81} = 9$ $9 \times 4 = 36$	36	3	M1 for $\sqrt{81}$ or 9 M1 for 9×4 A1 for 36 cao

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
23	(a)	1 - 0.37	0.63	1	B1 for 0.63 oe
	(b)	0.37 × 500	185	2	M1 for 0.37 × 500 A1 cao (SC B1 for answer of 200)

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*24 QWC		$10 - 4 = 6$ $8 \times 4 = 32$ $(6 \times 3)/2 = 9$ $32 + 9$ $8 - 3 = 5$ $\frac{1}{2}(10 + 4) \times 3 = 21$ $4 \times 5 = 20$ $21 + 20$	41cm^2	4	M1 for 8×4 (= 32) or $(6 \times 3)/2$ (= 9) M1 for 8×4 (= 32) and $(6 \times 3)/2$ (= 9) A1 for 41 C1 (dep on M1) for '41' cm^2 OR M1 for 4×5 (= 20) or $\frac{1}{2}(10 + 4) \times 3$ (= 21) M1 for 4×5 (= 20) and $\frac{1}{2}(10 + 4) \times 3$ (= 21) A1 for 41 C1 (dep on M1) for '41' cm^2 OR M1 for 10×8 (= 80) or $\frac{1}{2}(5 + 8) \times 6$ (= 39) M1 for 10×8 (= 80) and $\frac{1}{2}(5 + 8) \times 6$ (= 39) A1 for 41 C1 (dep on M1) for '41' cm^2 OR M1 for 4×5 (= 20) or 3×4 (= 12) or $(6 \times 3)/2$ (= 9) M1 for 4×5 (= 20) and 3×4 (= 12) and $(6 \times 3)/2$ (= 9) A1 for 41 C1 (dep on M1) for '41' cm^2

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
25		<table><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td></tr><tr><td>y</td><td>-1</td><td>1</td><td>3</td><td>5</td><td>7</td></tr></table>	$y = 2x + 3$ drawn	4	**(Table of values)** C1 for axes scaled and labelled (condone zero omitted at origin) M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be plotted correctly) A1 for correct line **(No table of values)** C1 for axes scaled and labelled (condone zero omitted at origin) M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 2x+3$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points with no more than 2 incorrect points) A1 for correct line **(Use of y=mx+c)** C1 for axes scaled and labelled (condone zero omitted at origin) M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y = 2x+3$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 2 OR line drawn with a y intercept of 3 and a positive gradient) A1 for correct line

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
26* QWC		180 – 150 = 30 180 – 90 – 35 – 30 OR 180 – 150 = 30 180 – 35 – 90 = 55 180 – 55 = 125 180 – 30 – 125 OR 150 – 90 – 35	25	4 ‘	M1 for 180 – 150 (= 30) M1 (dep) for 180 – 90 – 35 – ‘30’ A1 for 25 cao C1 for angles on a straight line total 180° AND angles in a triangle total 180° OR M1 for 180 – 150 (= 30) M1 (dep) for 180 – 35 – 90 (= 55), 180 – ‘55’(=125) and 180 – ‘30’ – ‘125’ A1 for 25 cao C1 for angles on a straight line total 180° AND angles in a triangle total 180° OR M2 for 150 – 90 – 35 A1 for 25 cao C1 for exterior angle of a triangle is equal to the sum of the interior opposite angles
27			Rotation Centre (0,0) 90° clockwise	3	B1 for rotation B1 for 90°clockwise or 270° anti clockwise B1 for (0,0) or O or origin NB: a combination of transformations gets B0

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Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Tuesday 19 June 2012 – Afternoon
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P41210A

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6/6/7/

P 4 1 2 1 0 A 0 1 2 8

PEARSON

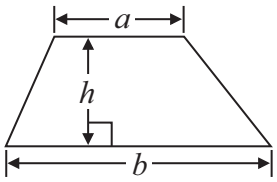
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GCSE Mathematics 2MM01

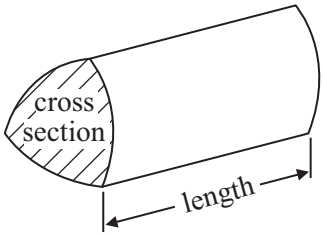
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 (a) Write the number **fifty nine thousand and eighty one** in figures.

.....

(1)

(b) Write the number 8305 in words.

.....

(1)

(c) Work out 630 – 72

.....

(1)

(d) Work out 29 × 1000

.....

(1)

(e) Work out 400 ÷ 50

.....

(1)

(Total for Question 1 is 5 marks)

2 Draw a circle around the word that best describes the following possibilities.

(i) You throw a fair coin and get tails.

Impossible	Unlikely	Even	Likely	Certain

(ii) There are three red counters and five blue counters in a bag.
You take a yellow counter from the bag.

Impossible	Unlikely	Even	Likely	Certain

(Total for Question 2 is 2 marks)

3 (a) Write the number 36.82 to the nearest whole number.

.....

(1)

(b) Write the number 547 to the nearest hundred.

.....

(1)

(c) Write the number 6.934 correct to 2 decimal places.

.....

(1)

(Total for Question 3 is 3 marks)

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4 (a) Simplify $x + 2x + 3x$

.....

(1)

(b) Simplify $y \times y \times y$

.....

(1)

(c) Simplify fully $6f - 2g + f - 3g$

.....

(2)

(Total for Question 4 is 4 marks)

---

5 Here is a list of numbers.

6 8 10 18 20 25 48 50

From the numbers in the list, write down

(i) a square number

.....

(ii) a cube number

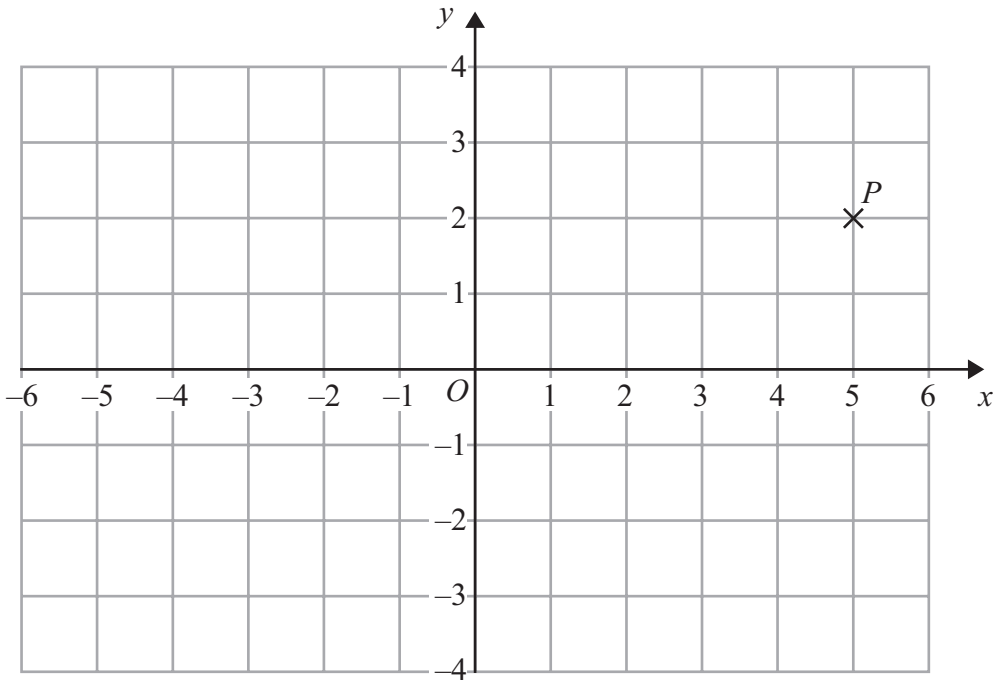
.....

(iii) an estimate for $\sqrt{96}$

.....

(Total for Question 5 is 3 marks)

6



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

(..... , ...)

(1)

Q has coordinates $(-3, -2)$.

(b) Write down the coordinates of the midpoint of the line PQ.

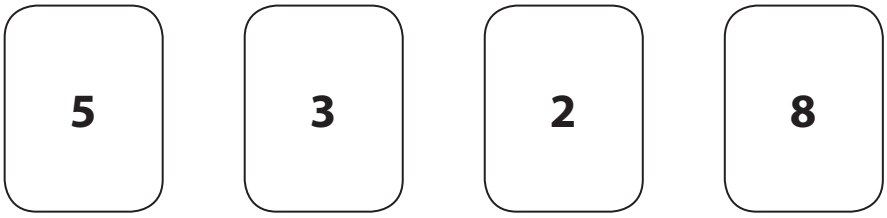
(..... , ...)

(2)

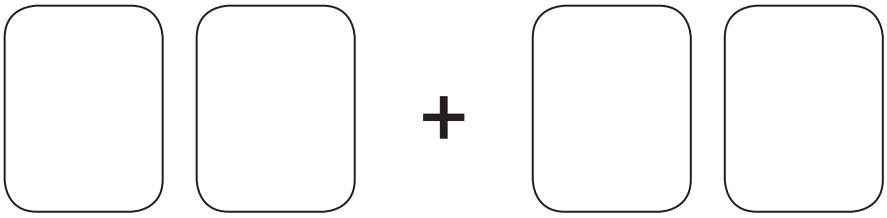
(Total for Question 6 is 3 marks)

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7 Here are four number cards.



(i) Use each card once only to make the smallest total for the calculation below.



(ii) Work out the answer to this calculation.

.....

(Total for Question 7 is 2 marks)

8 Here is a triangle.

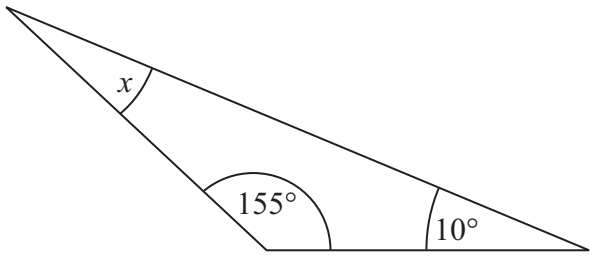


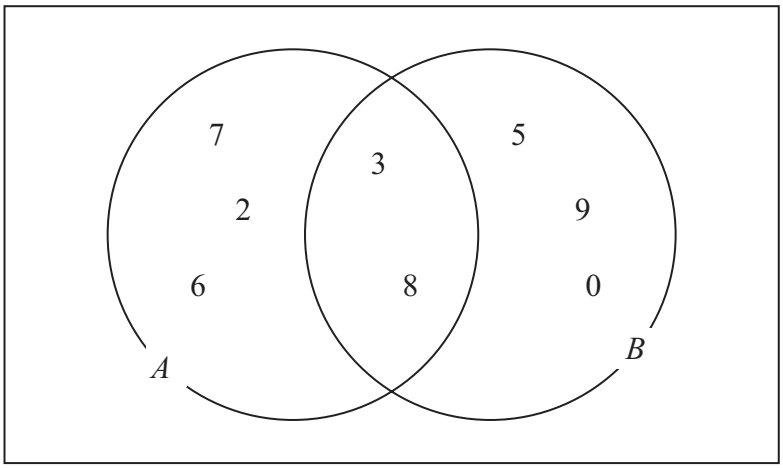
Diagram **NOT** accurately drawn

Work out the size of the angle marked x.

..... °

(Total for Question 8 is 2 marks)

9 Here is a Venn diagram.



(a) Write down all the numbers in set A.

.....

(2)

(b) Write down the numbers that are in set A and also in set B.

.....

(1)

(Total for Question 9 is 3 marks)

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10 (a) Solve $6x = 18$

$x =$ .....

(1)

(b) Solve $f + 3 = 8$

$f =$ .....

(1)

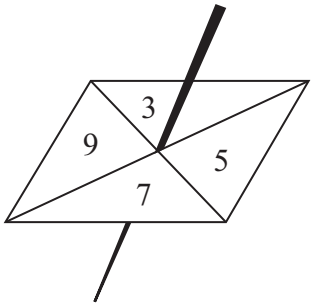
(c) Solve $6c - 7 = 2$

$c =$ .....

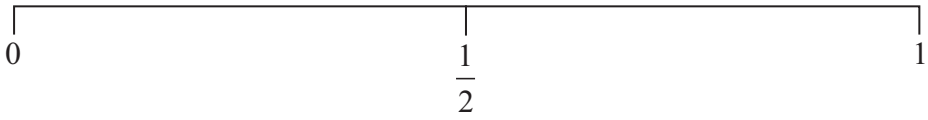
(2)

(Total for Question 10 is 4 marks)

11 Ed spins a fair 4-sided spinner once.
The spinner can land on 3 or on 5 or on 7 or on 9

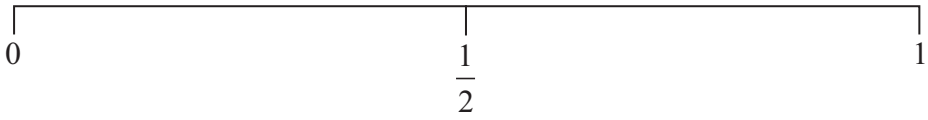


(a) On the probability scale below mark, with a cross (×), the probability that the spinner will land on an odd number.



(1)

(b) On the probability scale below mark, with a cross (×), the probability that the spinner will land on 3

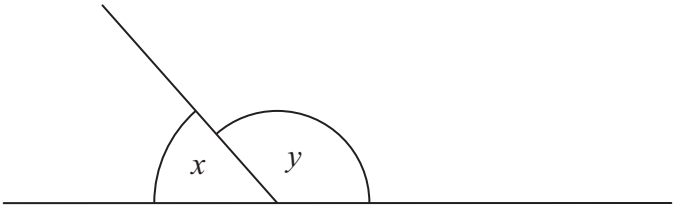


(1)

(Total for Question 11 is 2 marks)

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12



(a) (i) Write down the mathematical name for the type of angle marked x.

.....

(ii) Write down the mathematical name for the type of angle marked y.

.....

(2)

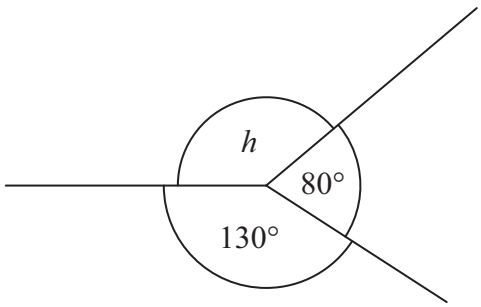


Diagram **NOT** accurately drawn

(b) (i) Work out the size of the angle marked h.

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

(Total for Question 12 is 4 marks)

13 Matt thinks of two numbers.

Matt adds the two numbers and gets 20
One number is 4 more than the other number.

(a) Find the two numbers.

..... and .....
(1)

(b) Find **two** different factors of 24 that add together to make 12

..... and .....
(2)

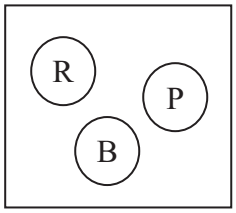
(Total for Question 13 is 3 marks)

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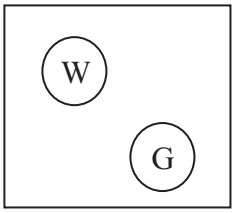
14 There are three counters in Box **X**.
One counter is red, one counter is blue and one counter is pink.

There are two counters in Box **Y**.
One counter is white and one counter is green.

Box **X**



Box **Y**



Erin takes at random a counter from Box **X** and then a counter from Box **Y**.

List all the possible outcomes she can get.

.....

.....

(Total for Question 14 is 2 marks)

15 Here is a parallelogram.

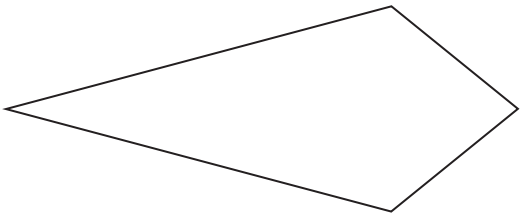


(a) Write down the order of rotational symmetry of this parallelogram.

.....

(1)

(b) Draw the line of symmetry on this kite.



(1)

(Total for Question 15 is 2 marks)

16 (a) Work out $20 \div 5 + 5$

.....

(1)

(b) Work out $6 + 3 \times 2$

.....

(1)

(c) Add brackets ( ) to make this statement correct.

$$10 - 2 \times 3 + 1 = 2$$

(1)

(d) Work out $-3 + -2$

.....

(1)

(e) Work out $20 - -5$

.....

(1)

(Total for Question 16 is 5 marks)

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17 $c = 8$

(a) Work out the value of $11 - c$.

.....

(1)

$r = 5(p + q)$

$p = 2$
$q = -6$

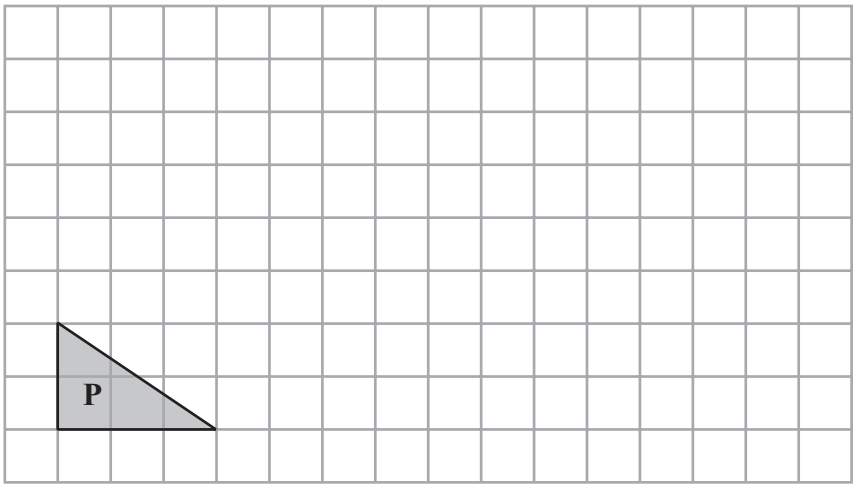
(b) Work out the value of r.

.....

(2)

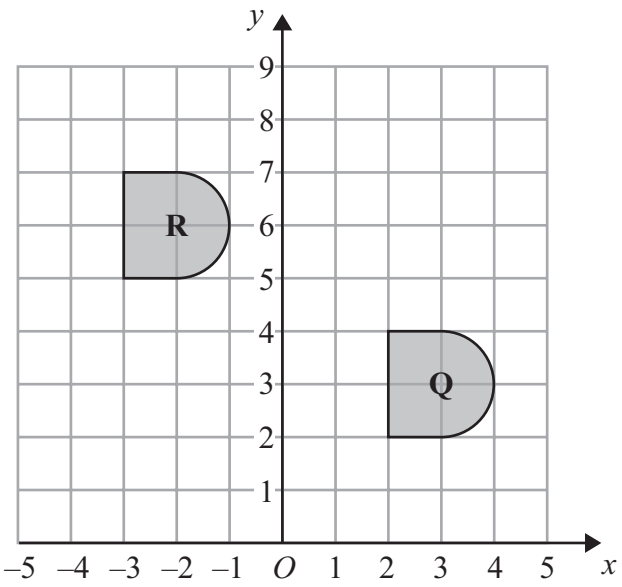
(Total for Question 17 is 3 marks)

18



(a) On the grid, draw an enlargement of triangle **P** with scale factor 3

(2)



(b) Describe fully the single transformation that maps shape **Q** onto shape **R**.

.....

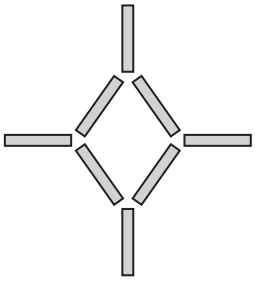
.....

(2)

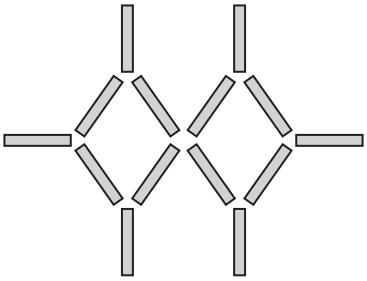
(Total for Question 18 is 4 marks)

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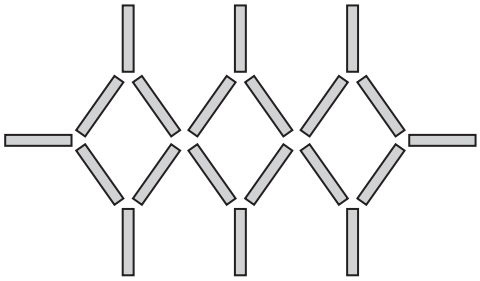
19 Here are some patterns made from sticks.



Pattern number 1

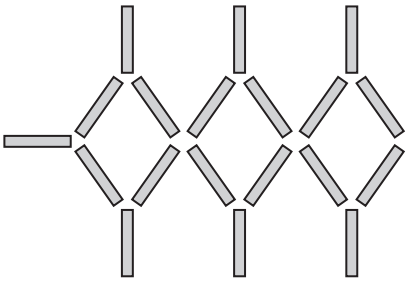


Pattern number 2



Pattern number 3

(a) In the space below, complete Pattern number 4



Pattern number 4

(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of sticks	8	14	20		

(1)

(c) Which Pattern number uses 122 sticks?

.....

(2)

(Total for Question 19 is 4 marks)

20 (a) Write $\frac{24}{36}$ in its simplest form.

.....

(1)

(b) Work out $\frac{1}{5} \times \frac{3}{7}$

.....

(1)

(c) Work out $\frac{1}{6} + \frac{2}{3}$

.....

(2)

(d) Work out 15.3×6

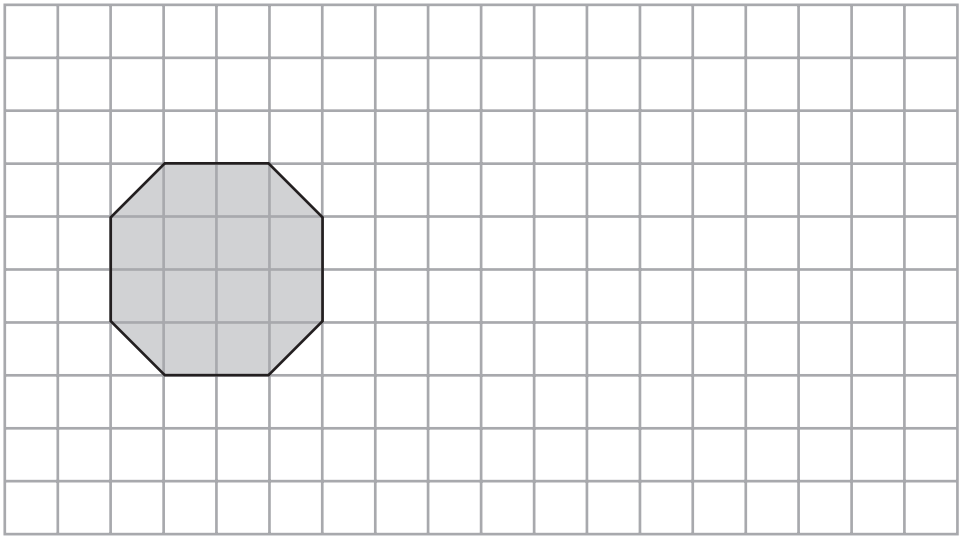
.....

(2)

(Total for Question 20 is 6 marks)

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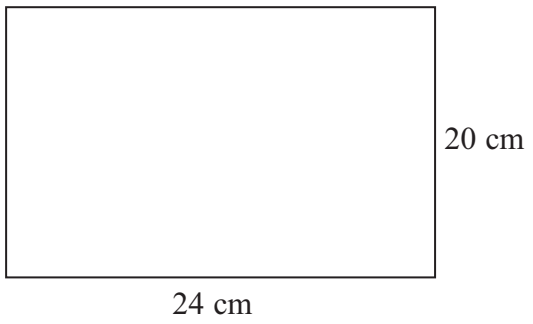
21



On the grid, draw a rectangle that has the same area as the shaded shape.

(Total for Question 21 is 2 marks)

22 Here are two rectangles.



Diagrams **NOT** accurately drawn

The large rectangle is 24 cm by 20 cm.
The small rectangle is 3 cm by 5 cm.

Work out the number of small rectangles needed to make the large rectangle.
You must show all your working.

.....

(Total for Question 22 is 3 marks)

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23 There are 300 beads in a box.

The beads are red or yellow or black or white or green.

The table shows each of the probabilities that a bead taken at random from the box will be red or yellow or white or green.

Colour	**Red**	**Yellow**	**Black**	**White**	**Green**
Probability	0.35	0.15		0.18	0.12

A bead is to be taken at random from the box.

(a) Work out the probability that the bead will be black.

.....

(2)

There are 300 beads in the box.

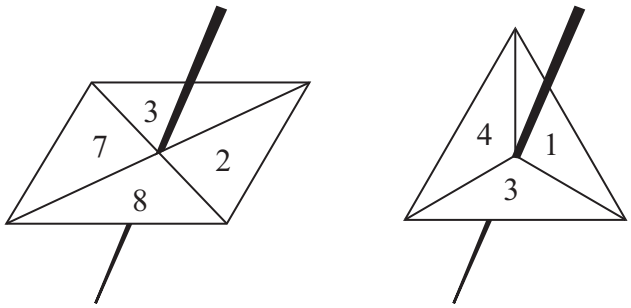
(b) Work out the number of red beads in the box.

.....

(2)

(Total for Question 23 is 4 marks)

24 Here are two fair spinners.



Mylene spins each spinner once.
Each spinner lands on a number.

Mylene adds these two numbers together to get the total score.

(i) Work out the probability that the total score will be 6

.....

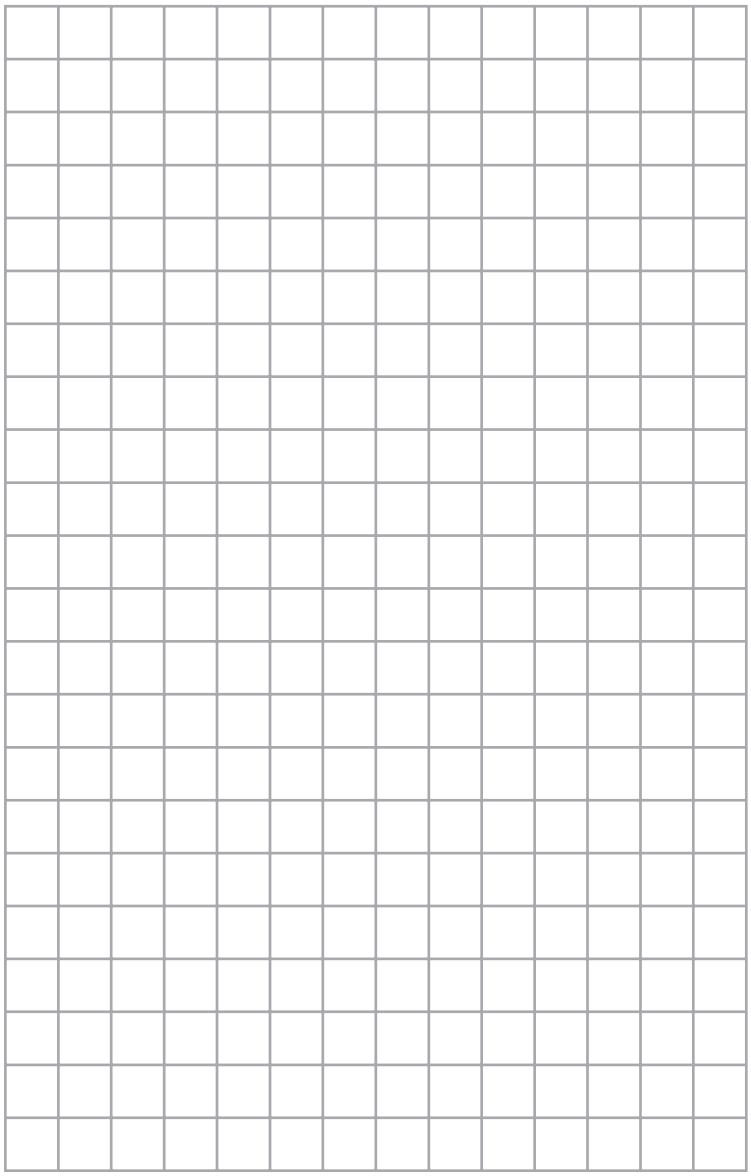
(ii) Work out the probability that the total score will be more than 9

.....

(Total for Question 24 is 5 marks)

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25 On the grid, draw the graph of $y = 5x + 2$ for values of x from -2 to 2



(Total for Question 25 is 4 marks)

***26**

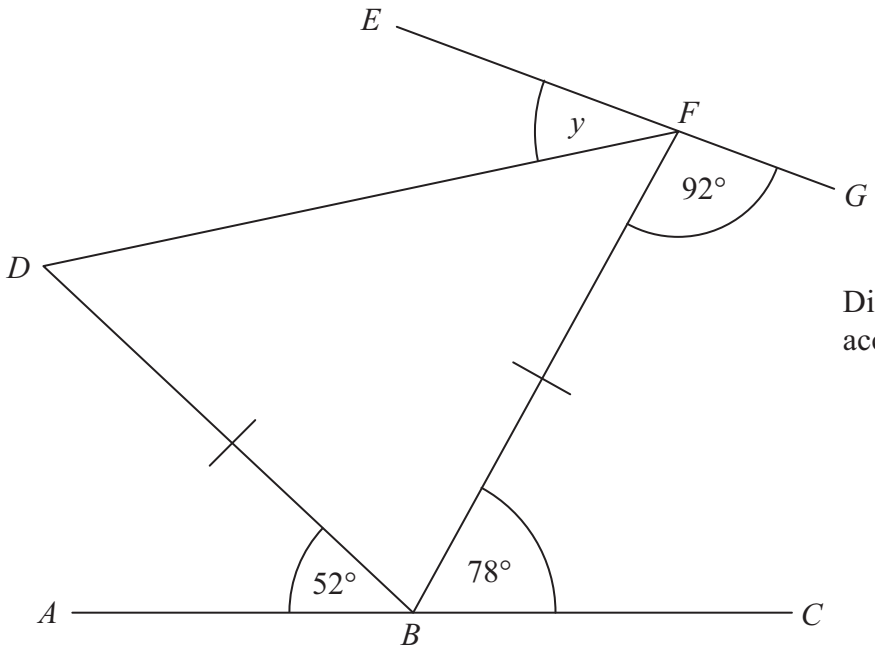


Diagram **NOT** accurately drawn

ABC and *EFG* are straight lines.
BDF is a triangle.
BD = *BF*.

Work out the size of the angle marked *y*.
Give reasons for your answer.

(Total for Question 26 is 5 marks)

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***27**

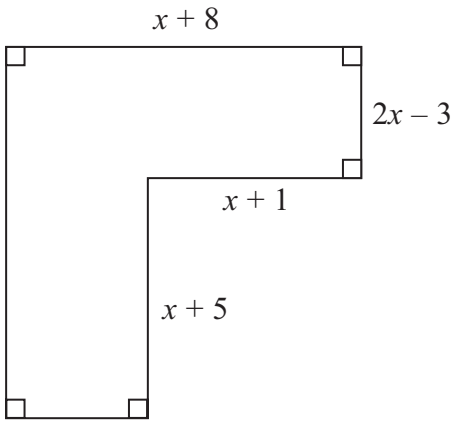


Diagram **NOT** accurately drawn

All the measurements are in centimetres.

The perimeter of this shape is 68 cm.

Use algebra to work out the value of x.
You must show all your working.

(Total for Question 27 is 5 marks)

28 The lights and brakes of 50 cars were tested.

10 of the cars failed the lights test.
4 of the cars failed both the lights test and the brakes test.
32 of the cars passed both the lights test and the brakes test.

(a) Draw a Venn diagram to show this information.

(4)

One of the 50 cars is chosen at random.

(b) Work out the probability that this car failed the brakes test.

.....

(2)

(Total for Question 28 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

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Mark Scheme (Results)

June 2012

Methods in Mathematics (GCSE)
Unit 1: Methods 5MM1F_01

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June 2012
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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		59081	1	B1 cao
	(b)		eight thousand three hundred and five	1	B1 cao
	(c)		558	1	B1 cao
	(d)		29 000	1	B1 cao
	(e)		8	1	B1 cao
2	(i)		even	1	B1 cao
	(ii)		impossible	1	B1 cao
3	(a)		37	1	B1 for x marked between ⅜ and ⅝
	(b)		500	1	B1 for x marked near 0
	(c)		6.93	1	B1 for x marked between ½ and ¾
4	(a)		$6x$	1	B1 cao
	(b)		y^3	1	B1 cao
	(c)		$7f - 5g$	2	M1 for $6f + f$ **or** $-2g - 3g$ **or** $7f$ **or** $-5g$ A1 cao

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(i)		25	1	B1 cao
	(ii)		8	1	B1 cao
	(iii)		10	1	B1 cao
6	(a)		(5, 2)	1	B1 cao
	(b)	Plot (–3, –2), join *PQ* and draw midpoint OR $\left(\frac{5+-3}{2}, \frac{2+-2}{2}\right)$	(1, 0)	2	M1 for (1, *y*) **or** (*x*, 0) A1 for (1, 0) **OR** M1 ft from (a) for $\left(\frac{'5'+-3}{2}\right)$oe **or** $\left(\frac{'2'+-2}{2}\right)$oe A1 ft from (a) SC : B1 for an answer of (0, 1)
7	(i)		28 + 35 or 25 + 38	1	B1 for 28 + 35 or 25 + 38
	(ii)		63	3	B1 ft from (i) dep on all 4 digits used

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Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)	180 – 155 – 10 = 180 – 165	15	2	M1 for 180 – 155 – 10 oe A1 cao
9	(a)		2,3,6,7,8	2	B2 for 2, 3, 6, 7, 8 (B1 for any 3 or 4 correct, no extras **or** 2, 3, 6, 7, 8 seen with at most one extra)
	(b)		3,8	1	B1 cao
10	(a)		3	1	B1 cao
	(b)		5	1	B1 cao
	(c)		$\frac{3}{2}$	2	M1 for $6c = 2 + 7$ oe **or** the clear intention to add 7 to both sides of the equation **or** $6c = 9$ **or** $(c =) 9 \div 6$ **or** a correct reverse flow diagram eg. ← ÷6 ← +7 ← A1 for 1.5 oe
11	(a)		mark at 1	1	B1 for × within the overlay (within 1 cm of 1)
	(b)		mark at 1/4	1	B1 for × within the overlay (between 2 and 4 cm from 0)

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)(i)		acute	1	B1 cao
	(ii)		obtuse	1	B1 cao
	(b)(i)		150	1	B1 cao
	(ii)		reason	1	B1 cao
13	(a)		8 and 12	1	B1 for 8 and 12
	(b)		8 and 4	2	M1 for a list of at least 2 different factors (not 24) of 12 in the working space with no more than one incorrect factor **or** for an answer of any two factors of 24 (not 24)**or** 6 and 6 A1 cao
14		RW, RG, PW, PG, BW, BG (WR, GR, WP, GP, WB, GB)	all 6 given	2	B2 for all 6 pairs correct, no repeats or extras **OR** all 12 pairs correct taking order into consideration (B1 for 4 pairs or 5 pairs correct)
15	(a)		2	1	B1 cao
	(b)		Line of symmetry	1	B1 cao

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)		9	1	B1 cao
	(b)		12	1	B1 cao
	(c)		brackets	1	B1 for $10 - 2 \times (3 + 1) = 2$
	(d)		–5	1	B1 cao
	(e)		25	1	B1 cao
17	(a)		3	1	B1 cao
	(b)	$5(2 - 6) = 5 \times -4$	–20	2	M1 for $5 \times 2(=10)$ **or** $5 \times -6(= -30)$ **or** –4 seen A1 cao

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)		enlargement	2	B2 for a correct enlargement, scale factor 3 in any orientation (B1 for a right angled triangle with 1 line correctly enlarged **or** a correct enlargement by incorrect scale factor in any orientation)
	(b)		translation $\begin{pmatrix} -5 \\ 3 \end{pmatrix}$	2	B1 for translation B1 for $\begin{pmatrix} -5 \\ 3 \end{pmatrix}$ NOTE: Combination of transformations scores B0
19	(a)		Draw pattern 4	1	B1 cao
	(b)		26,32	1	B1 cao
	(c)	$6n + 2 = 122$, $6n = 120$ or eg $20 + 17 \times 6 = 122$ so $3 + 17 = 20$ etc 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98, 104, 110, 116, 122	20	2	M1 for $6n + 2 = 122$ oe **or** any valid method to reach 20 **or** $(122 - 2) \div 6$ A1 for 20 **or** 20th pattern oe **OR** M1 (ft from candidate's answer to (b)) for evidence of the sequence being continued in an attempt to get to 122 - sequence must go up to or beyond 122; condone one arithmetic error A1 for 20 **or** 20th pattern oe

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Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)		$\frac{2}{3}$	1	B1 cao
	(b)		$\frac{3}{35}$	1	B1 for $\frac{3}{35}$ oe
	(c)		$\frac{5}{6}$	2	M1 for correct common denominator and at least one correct numerator (must be $\frac{4}{6}$ if 6 used as common denominator) A1 for $\frac{5}{6}$ oe
	(d)	$\begin{array}{r} 153 \\ \times \quad 6 \\ \hline 918 \end{array}$	91.8	2	M1 for valid method to multiply 153 × 6 (ignore decimals), allow 1 arithmetic error **or** the digits 918 in the answer A1 for 91.8 oe **OR** M1 for a valid method to multiply 15.3 by 6, allow 1 arithmetic error but **not** the error 0.3×6=0.18 A1 for 91.8 oe NB: An answer of 90.18 scores M0A0

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Question		**Working**	**Answer**	**Mark**	**Notes**
21			correct rectangle drawn	2	M1 for a rectangle (or square) drawn **or** sight of 14 **or** a non-rectangular shape with area 14 A1 for a rectangle with area 14 eg 7 by 2, 14 by 1
22		$20 \times 24 = 480$ $3 \times 5 = 15$ $480 \div 15 = 32$ $20 \div 5 = 4$ $20 \div 3 = 8$ $4 \times 8 = 32$	32	3	M1 for 20×24 (= 480) **or** 5×3 (= 15) M1(dep) for $(20 \times 24) \div (5 \times 3)$ A1 cao **OR** M1 for 8 **and** 4 seen (may be on diagram) **or** 8 divisions seen on length of diagram **or** 4 divisions seen on width of diagram M1 for 32 rectangles seen on diagram A1 cao **OR** M1 for $20 \div 5$ (= 4) **or** $24 \div 3$ (= 8) M1(dep) for $(20 \div 5) \times (24 \div 3)$ A1 cao
23	(a)	$1 - (0.35+0.15+0.18+0.12)$ $= 1 - 0.8(0)$	0.2	2	M1 for $1 - '(0.35 + 0.15 + 0.18 + 0.12)'$ oe A1 oe
	(b)	300×0.35	105	2	M1 for 300×0.35 A1 cao SC : B1 for an **answer** of $\frac{105}{300}$

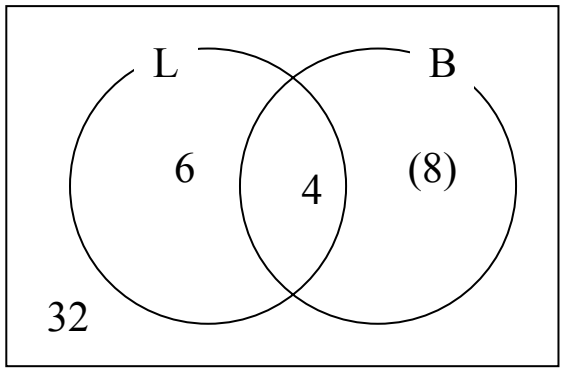
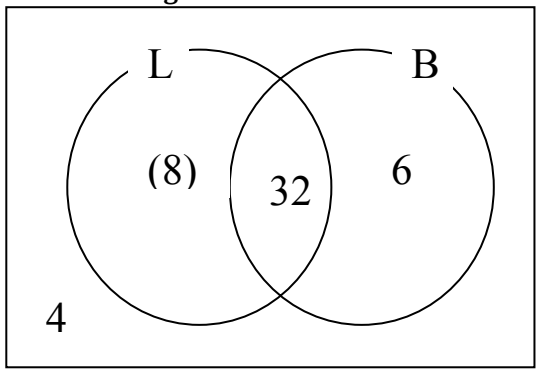
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Question		Working	Answer	Mark	Notes
24	(i)	<table><tr><th>+</th><th>2</th><th>3</th><th>7</th><th>8</th></tr><tr><th>1</th><td>3</td><td>4</td><td>8</td><td>9</td></tr><tr><th>3</th><td>5</td><td>6</td><td>10</td><td>11</td></tr><tr><th>4</th><td>6</td><td>7</td><td>11</td><td>12</td></tr></table>	$\frac{2}{12}$	5	M1 for identifying 2,4 and 3,3 M1 for 12 seen **OR** an attempt to get the 12 outcomes or attempt at a sample space or a list of possibilities or a list of ordered pairs (at least 6 correct outcomes or possibilities or ordered pairs (ignore repeats) A1 for $\frac{2}{12}$ oe **OR** M1 for $\frac{1}{4}\times\frac{1}{3}$ oe seen M1 for $\frac{1}{4}\times\frac{1}{3}+\frac{1}{3}\times\frac{1}{4}$ oe A1 for $\frac{2}{12}$ oe
	(ii)		$\frac{4}{12}$		M1 ft from their ordered list from part (i) for identifying all four possible scores from; 7+4(=11), 7+3(=10), 8+4(=12), 8+3(=11), (condone the inclusion of 8+1(=9) as a misread) [accept an answer of $\frac{5}{12}$ for M1 ONLY if the 5 outcomes are identified in either part (i) or part (ii)] A1 for $\frac{4}{12}$ oe

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Question		**Working**	**Answer**	**Mark**	**Notes**
25			$y = 5x + 2$ drawn		C1 for acceptable scaling and labelling of the axes **(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x M1 ft for plotting at least 2 of their points (any points from their table must be correctly plotted) A1 for correct line **(No table of values)** M2 for at least 2 correct points (and no incorrect points) plotted **OR** line segment of $y = 5x + 2$ drawn (ignore any additional incorrect line segments) (M1 for at least 3 correct points plotted with no more than 2 incorrect points) A1 for correct line **(Use of $y = mx + c$)** M2 for line segment of $y = 5x + 2$ drawn (ignore any additional incorrect line segments) (M1 for line drawn with gradient of 5 **OR** Line drawn with a y intercept of 2 **and** a positive gradient) A1 for correct line

x	–2	–1	0	1	2
y	–8	–3	2	7	12

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Question		**Working**	**Answer**	**Mark**	**Notes**
26		< *DBF* = 180 – 52 – 78 = 50 angles on a line = 180 < *BFD* = (180 – '50') ÷ 2 = 65 isosceles triangle angles in a triangle add up to 180 *x* = 180 – 92 – 65 = 23	23 with reasons	5	M1 for < *DBF* = 180 – 52 – 78 **or** 50 seen **or** *x* = 180 – 92 –'65' M1 for < *BFD* = (180 – '50') ÷ 2 (= 65) A1 for y = 23 C2 (dep on M1) for correct reasons – angles on a straight line sum to 180º, base angles in an isosceles triangle are equal, and angles in a triangle add up to 180 (C1 (dep on M1) for any one reason used correctly)
27		(*x* + 8) + (2*x* – 3) + (*x* + 1) + (*x* + 5) + 7 + (3*x* + 2) 8*x* + 20 = 68 8*x* = 68 – 20 = 48	6 with working	5	M1 for attempt to work out missing length of vertical side **or** sight of 2*x* – 3 + *x* + 5 **or** 3*x* + 2 M1 for attempt to work out missing length of horizontal side **or** sight of *x* + 8 – (*x* + 1) **or** 7 M1 adding at least 4 sides e.g. *x* + 8 + 2*x* – 3 + *x* + 1 + *x* + 5 M1 for attempt to add all their 6 sides and form equation e.g. '8*x* + 20' = 68 C1 (dep on M1) indicating that *x* = 6 (cm) **OR** M1 for using any value for *x*, substituting to find lengths of at least 4 sides and clear intent to add M3 for a complete method using *x* = 6 C1 (dep on M1) indicating that *x* = 6 (cm)

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Question		**Working**	**Answer**	**Mark**	**Notes**
28	(a)	**Fail Venn diagram**  **Pass Venn diagram**  	Venn diagram	4	M1 for two overlapping ovals M1 for 4 shown in the intersection M1 for attempt to show 10 – 4 **or** 50 – 32 – 10 A1 for 6 and 32 in the correct places. **OR** M1 for two overlapping ovals M1 for 32 shown in the intersection M1 for attempt to show 50 –10 – 32 (= 8) **or** 50 – 40 – 4 (= 6) A1 for 6 and 4 in the correct places.
	(b)		$\frac{12}{50}$	2	M1 (ft from diag) for 4 + their value for 8 (do **not** ft if their value for 8 is zero) A1 ft for $\frac{12}{50}$ oe

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Centre Number	Candidate Number

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Wednesday 16 November 2011 – Morning
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used**.



Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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6/6/6/3

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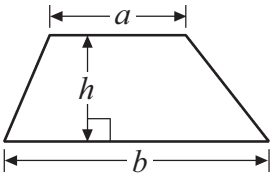
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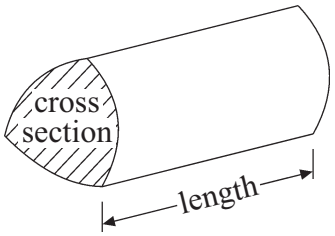
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 (a) (i) Write in words the number 1025

.....

(ii) Write the number **ten thousand three hundred and one** in figures.

.....

(2)

(b) (i) Write 24 570 correct to the nearest thousand.

.....

(ii) Write 24 570 correct to the nearest hundred.

.....

(2)

(Total for Question 1 is 4 marks)

2 (a) Work out 203 + 106

.....

(1)

(b) Work out 129 ÷ 3

.....

(1)

(c) Work out 23 × 5

.....

(1)

(d) Work out 3 + 2 × 4

.....

(1)

(Total for Question 2 is 4 marks)

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3 (a) Simplify $3y + 5y - 2y$

.....

(1)

(b) Simplify $2 \times a \times b$

.....

(1)

(c) Simplify $3xy + 2xy + 7xy$

.....

(1)

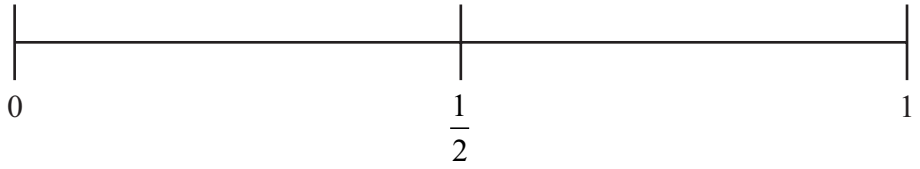
(d) Simplify $6a + 5b + 3a - 2b + 6$

.....

(2)

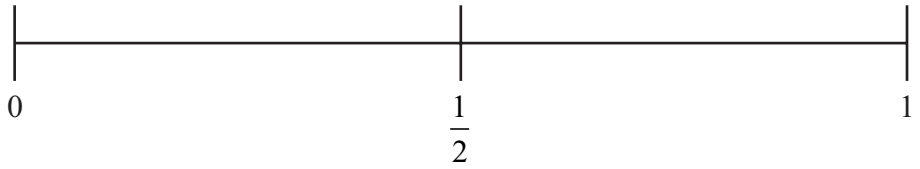
(Total for Question 3 is 5 marks)

4 (a) On the probability scale below, mark with the letter **X** the probability that a fair dice when thrown once will come down on an odd number.



(1)

(b) On the probability scale below, mark with the letter **X** the probability that a fair dice when thrown once will come down on a 4



(1)

(Total for Question 4 is 2 marks)

5 A rectangle is 4 cm by 8 cm.

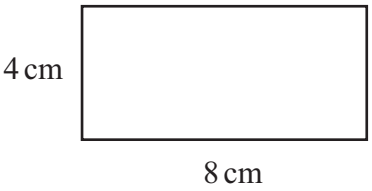


Diagram **NOT** accurately drawn

Four of the rectangles are used to make a larger rectangle as shown below.

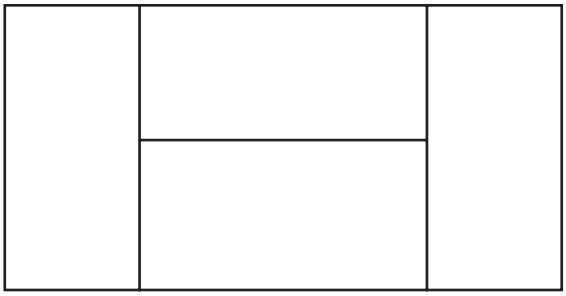


Diagram **NOT** accurately drawn

(a) Work out the perimeter of the larger rectangle.

.....cm

(3)

(b) Work out the area of the larger rectangle.

.....cm^2

(2)

(Total for Question 5 is 5 marks)

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6 Here is a list of numbers.

4 5 8 10 13 18

From the list write down

(i) an odd number

.....

(ii) a square number

.....

(iii) a multiple of 6

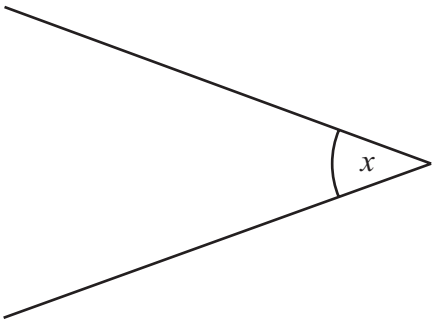
.....

(iv) a prime number

.....

(Total for Question 6 is 4 marks)

7 The angle x is drawn below.



(a) Estimate the size of angle x.

.....°

(1)

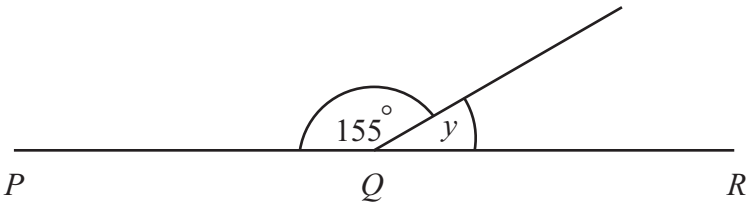


Diagram **NOT** accurately drawn

PQR is a straight line.

(b) (i) Work out the value of y.

.....°

(ii) Give a reason for your answer.

.....

(2)

(Total for Question 7 is 3 marks)

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8 Michelle has y pebbles.
Phoebe has 40 pebbles.

(a) Write down an expression for the total number of pebbles they have.

.....

(1)

Mick has x shells.
Andy has three times as many shells as Mick.
They have a total of 40 shells.

(b) Work out how many shells Mick has.

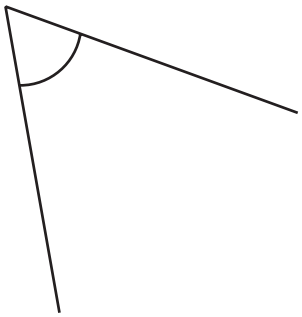
.....

(3)

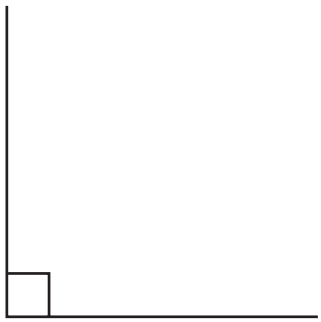
(Total for Question 8 is 4 marks)

9 Here are some diagrams with angles marked.

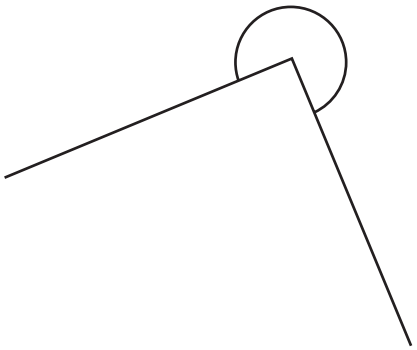
Draw a line from each diagram to the mathematical name of the type of angle.



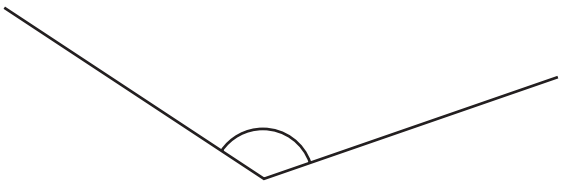
Right Angle



Acute Angle



Reflex Angle



Obtuse Angle

(Total for Question 9 is 3 marks)

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10 (a) (i) Write $\frac{8}{10}$ in its simplest form.

.....

(ii) Write $\frac{8}{3}$ as a mixed number.

.....

(2)

*(b) Here are two fractions

$$\frac{3}{4} \text{ and } \frac{5}{6}$$

Which is the larger fraction?

You must show clearly how you get your answer.

(3)

(Total for Question 10 is 5 marks)

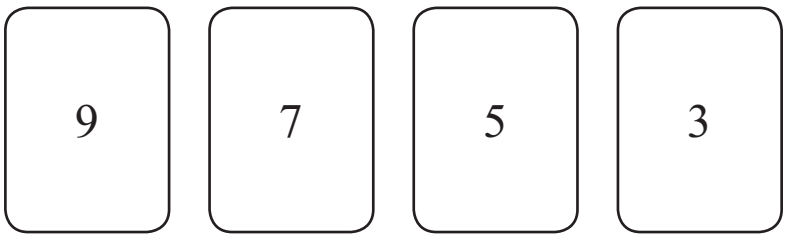
11 Sara thinks of a number.
Half of her number is 24

(a) What is double her number?

.....

(1)

Here are four number cards.



(b) Use only two of the cards to make the smallest two digit number.

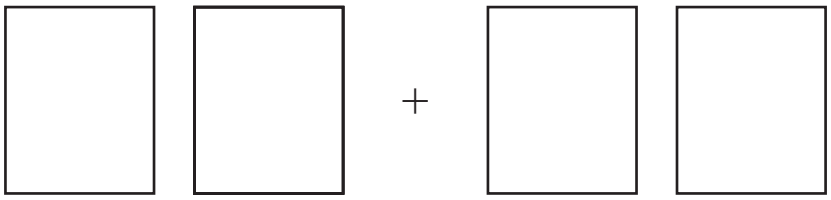
.....

(1)

(c) (i) Here are four digits.

4 7 6 2

Put one digit in each box to make the largest total.
You may only use each digit once.



(ii) Write down the total.

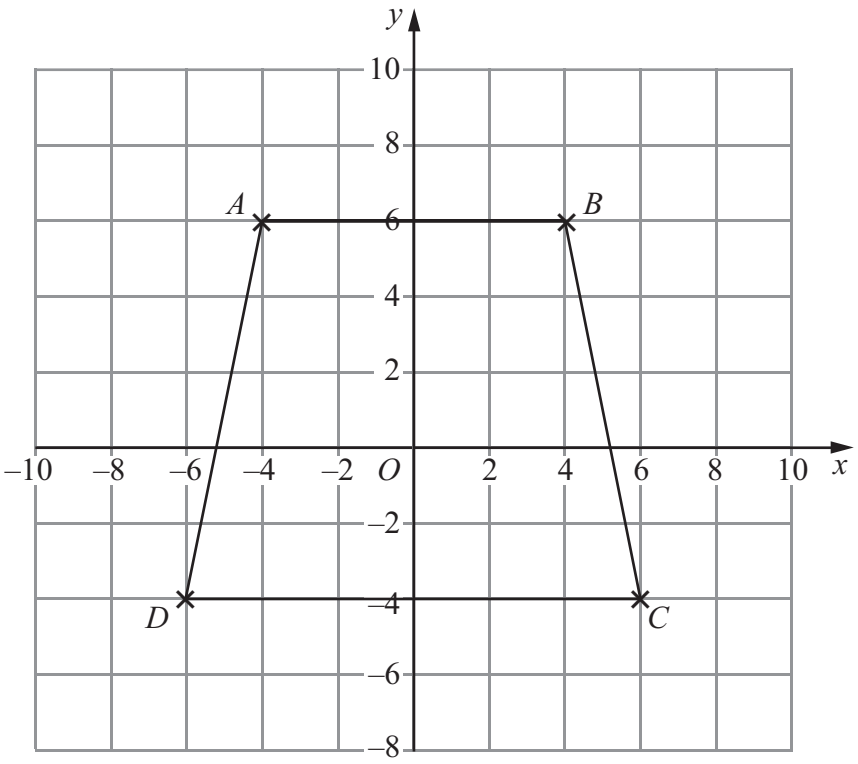
.....

(2)

(Total for Question 11 is 4 marks)

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12 Here is a grid of centimetre squares.



Four points have each been marked with a cross (×).

(a) Write down the coordinates of

(i) point B,

(.....,.....)

(ii) point C.

(.....,.....)

(2)

(b) What is the name of quadrilateral $ABCD$?

.....

(1)

(Total for Question 12 is 3 marks)

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13 Here are the first four terms of a number sequence.

2 6 10 14

(a) (i) What is the next term in the sequence?

.....

(ii) Explain how you found your answer.

.....

(2)

(b) What is the 7th term of the sequence?

.....

(1)

Jane says 34 is in the sequence.

(c) Is Jane correct? .....
Explain your answer.

.....

.....

(1)

(Total for Question 13 is 4 marks)

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14 (a) Draw a circle of radius 4 cm.
Use the cross (×) as the centre of your circle.



(2)

(b) Draw a diameter of your circle.

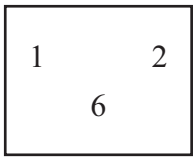
(1)

(Total for Question 14 is 3 marks)

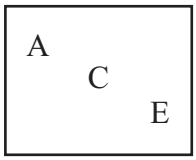
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15 David takes, at random, a number from Box A.
He then takes, at random, a letter from Box B.

Box A



Box B



(a) List all the possible outcomes he could get.

.....

.....

.....

(2)

(b) Find the probability that David takes the number 2 and the letter E.

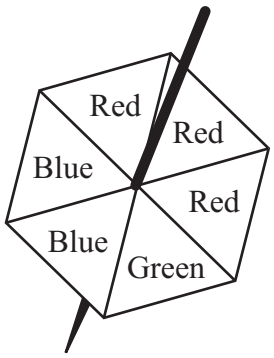
.....

(2)

(Total for Question 15 is 4 marks)

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16 Here is a fair 6-sided spinner.



Joel spins the spinner once.
The spinner will land on one of the colours.

(a) On which of the colours is the spinner most likely to land?

.....

(1)

(b) Write down the probability that the spinner will land on green.

.....

(1)

(c) Write down the probability that the spinner will land on red or green.

.....

(2)

(Total for Question 16 is 4 marks)

17 Write the following numbers in order of size.
Start with the smallest number.

$$1 \qquad \frac{1}{4} \qquad \frac{2}{3} \qquad 0.5 \qquad \frac{6}{5}$$

.....

(Total for Question 17 is 2 marks)

18 (a) Solve $6x = 18$

.....

(1)

(b) Solve $y + 7 = 11$

.....

(1)

(c) Solve $3a - 5 = 1$

.....

(2)

(d) Solve $\frac{c}{4} = 8$

.....

(1)

(Total for Question 18 is 5 marks)

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19 A bag contains only red counters and blue counters.
There are 4 red counters in the bag.

The probability of taking a blue counter is the same as the probability of taking a red counter.

(a) How many blue counters are there in the bag?

.....

(1)

In another bag there are 14 counters.
The bag contains only red counters, blue counters and yellow counters.
4 of the counters are red.

The probability of taking a blue counter is twice the probability of taking a red counter.

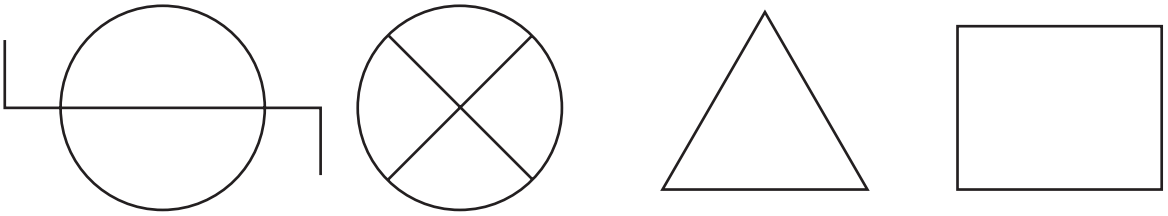
(b) How many yellow counters are there in the bag?

.....

(3)

(Total for Question 19 is 4 marks)

20 Here are four shapes.



A B C D

Two of these shapes have rotational symmetry of order 2

(a) Write down the letter of each of these **two** shapes.

..... and .....

(2)

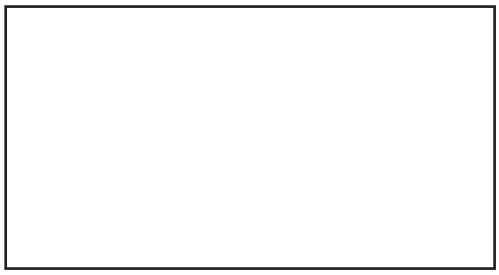
One of these shapes has **no** lines of symmetry.

(b) Write down the letter of this shape.

.....

(1)

(c) Draw all the lines of symmetry on the rectangle below.



(1)

(Total for Question 20 is 4 marks)

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21 (a) (i) Work out -7×4

.....

(ii) Work out -5×-3

.....

(2)

(b) Work out 254×23

.....

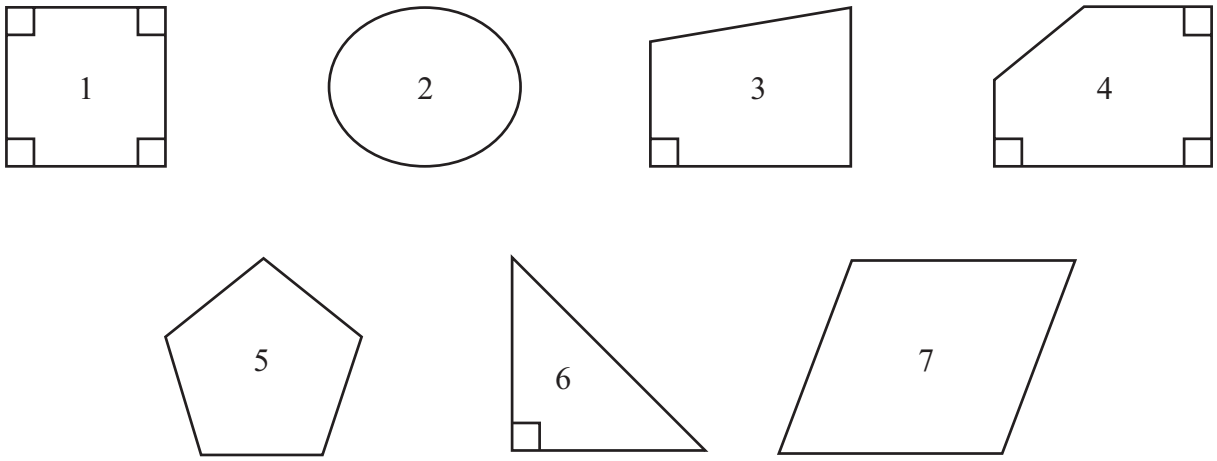
(3)

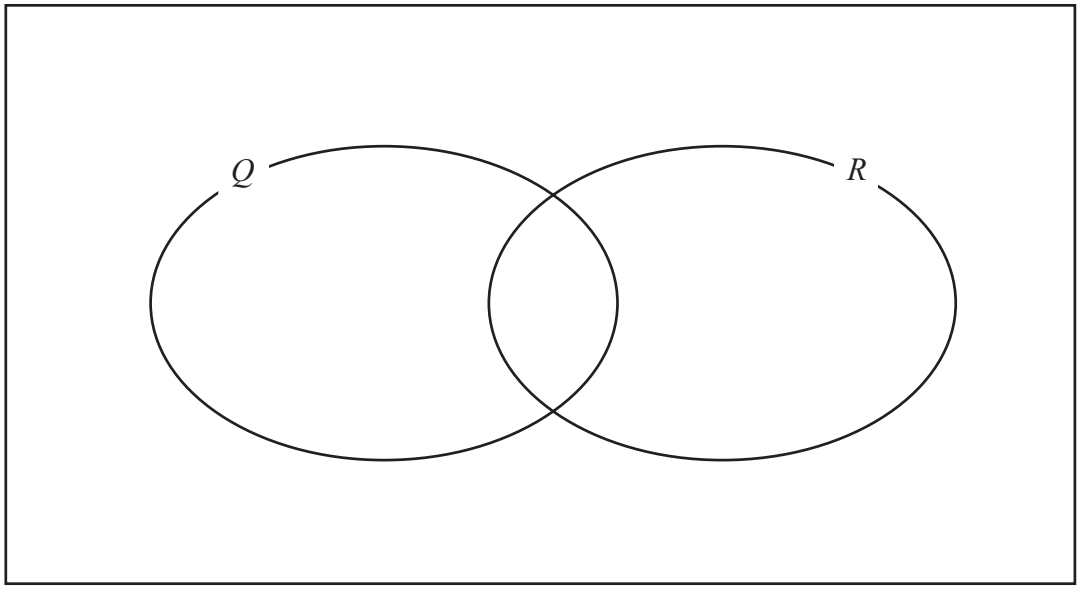
(Total for Question 21 is 5 marks)

22 Here are some shapes.
Some of the shapes are quadrilaterals and some of the shapes have at least one right angle.

Q = {quadrilaterals}.
R = {shapes which have at least one right angle}.

Write the number for each shape in the correct place in the Venn diagram.





(Total for Question 22 is 4 marks)

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23 Savio has two fair dice.
He throws the two dice and adds the scores together.

(i) What is the probability of getting a total of exactly 11?

.....

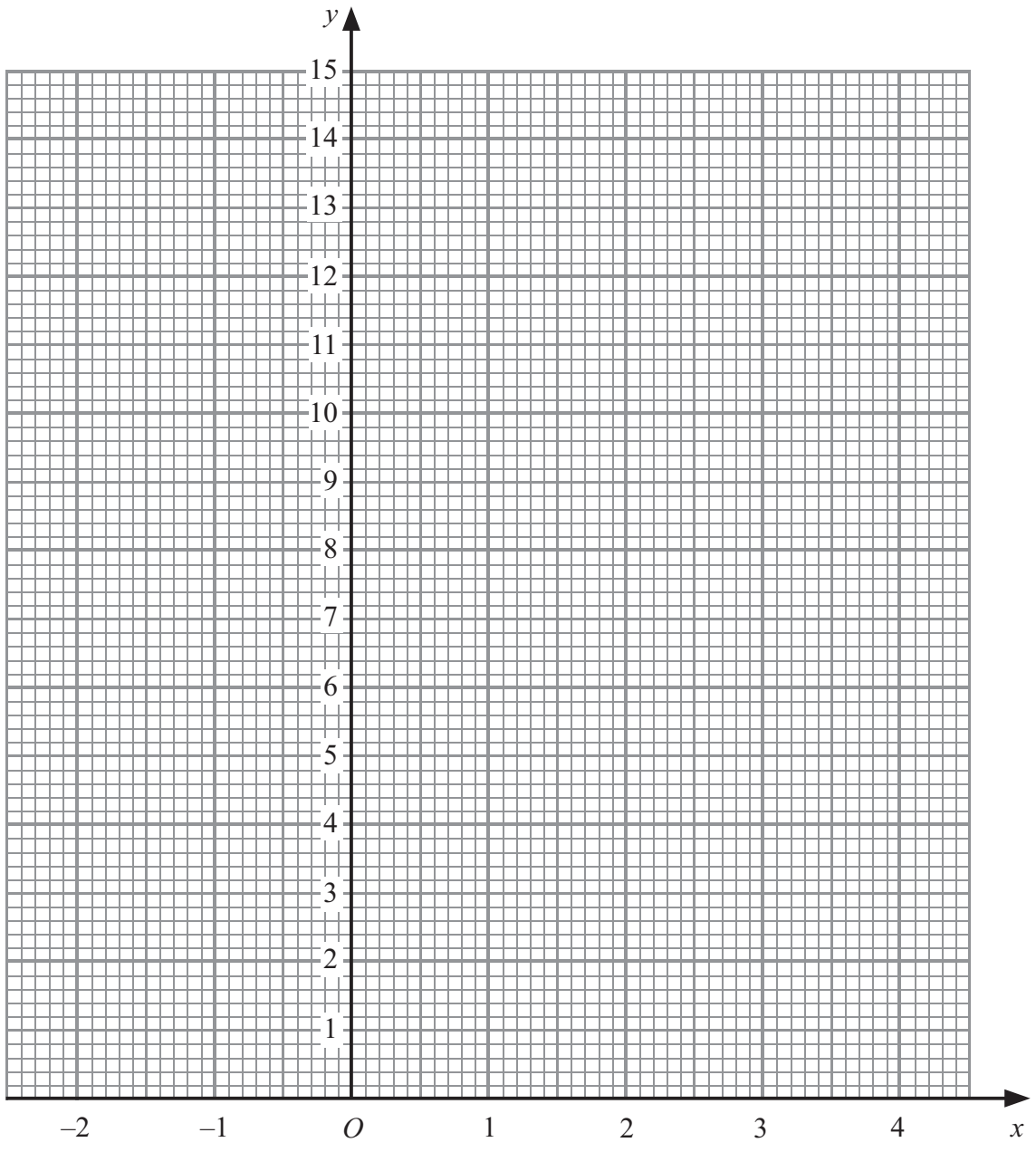
Savio says,

" The probability of getting a total of 5 or more is $\frac{3}{4}$ "

*(ii) Is Savio correct?
You must show your working.

(Total for Question 23 is 6 marks)

24 (a) On the grid, draw the graph of $y - 2x = 5$ for values of x from $x = -2$ to $x = 4$



(3)

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(b) Use your graph to find

(i) the value of y when $x = -0.5$

$y =$ .....

(ii) the value of x when $y = 8.2$

$x =$ .....

(2)

(Total for Question 24 is 5 marks)

25 A pizza shop sells eight types of pizzas.

This table gives information about the first 40 pizzas sold one evening.

Type of Pizza	Total
Margherita	8
Hawaiian	9
4 cheeses	4
Chicken	7
Vegetarian	8
Pepperoni	3
Farmhouse	0
Seafood	1

Using this information

(i) find an estimate for the probability that the next pizza sold will be a Margherita pizza,

.....

(ii) find an estimate for the probability that the next pizza sold will be either a Hawaiian or a Seafood pizza.

.....

(Total for Question 25 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

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Mark Scheme (Results)

November 2011

GCSE Mathematics (5MM1F)
Paper 01

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)(i)		One thousand (and) twenty five	1	B1 cao
	(ii)		10301	1	B1 cao
	(b)(i)		25000	1	B1 cao
	(ii)		24600	1	B1 cao
2	(a)		309	1	B1 cao
	(b)		43	1	B1 cao
	(c)		115	1	B1 cao
	(d)		11	1	B1 cao
3	(a)		$6y$	1	B1 cao
	(b)		$2ab$	1	B1 cao
	(c)		$12xy$	1	B1 cao
	(d)		$9a + 3b + 6$	2	M1 $3b$ or $9a$ seen as part of a 2 or 3 term expression A1 cao
4	(a)		Mark at $\frac{1}{2}$	1	B1 for mark at $\frac{1}{2}$ (allow ±2mm)
	(b)		Mark at $\frac{1}{6}$	1	B1 for mark at $\frac{1}{6}$ (allow ±5mm)

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)	8 + 4 + 8 + 4 + 8 + 4 + 8 + 4 OR (8 × 4) + (4 × 4) OR 4 + 8 + 4 = 16 16 × 2 + 8 × 2	48	3	M1 for 4 and 8 marked on diagram or attempt to find perimeter of small rectangle or addition of at least 2 sides of different lengths of larger rectangle eg 8 + 4 + 8 + 4 + ... M1 for complete method to find the perimeter using any of the methods shown A1 cao
	(b)	16 × 8 OR 4 × 8 = 32 32 × 4	128	2	M1 for a complete method to find the area of larger rectangle ie length × width for larger rectangle or length × width × 4 for small rectangle A1
6	(i)		5 or 13	1	B1 cao
	(ii)		4	1	B1 cao
	(iii)		18	1	B1 cao
	(iv)		5 or 13	1	B1 cao
7	(a)		40	1	B1 (allow ±10°)
	(b)(i)		25	2	B1 cao
	(ii)		Reason		B1 Angles (on a) straight line (add up to) 180°

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		$y + 40$	1	B1 for $y + 40$ oe
	(b)		10	3	M2 for $4x = 40$ oe or $40 \div 4$ (M1 for sight of $3x$ or $4x$) A1 cao SC B1 for 30 without working
9			Matched angles Diagram1 to Acute Angle Diagram2 to Right Angle Diagram3 to Reflex Angle Diagram4 to Obtuse Angle	3	B3 all correct (B2 two or three correct B1 one correct)
10	(a)(i)		$\frac{4}{5}$	2	B1 cao
	(ii)		$2\frac{2}{3}$		B1 cao

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
	(b)	18 and 20 shaded squares in 6 by 4 rectangles Or 0.75 and 0.83333 or 75% and 83(.33…)% Or $\frac{9}{12}$ and $\frac{10}{12}$	$\frac{5}{6}$	3	M1 for eg, drawing 4×6 rectangle and shading 18 squares for $\frac{3}{4}$ M1 for eg, drawing 4×6 rectangle shading 20 squares for $\frac{5}{6}$ C1 for correct conclusion with supportive evidence (dep M1 and comparison of shaded areas in 2 rectangles/shapes of equal area) Or M1 for writing $\frac{3}{4}$ as 0.75 or 75% M1 for writing $\frac{5}{6}$ as 0.83(333…) or 83(.33…..)% C1 for correct conclusion with supportive evidence (dep M1 and comparison of 2 decimals/percentages) Or M1 for writing $\frac{3}{4}$ or $\frac{5}{6}$ correctly with a common denominator eg $\frac{9}{12}$ or $\frac{10}{12}$ M1 for writing $\frac{3}{4}$ and $\frac{5}{6}$ correctly with a common denominator eg $\frac{9}{12}$ and $\frac{10}{12}$ C1 for correct conclusion with supportive evidence

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
		Or eg $\frac{3}{4}$ of 24 $\frac{5}{6}$ of 24			(dep M1 and comparison of 2 fractions with a correct common denominator) Or M1 for calculating $\frac{3}{4}$ of 'x' or $\frac{5}{6}$ of 'x' correctly with a common 'x' eg $\frac{3}{4}$ of 24 = 18 or $\frac{5}{6}$ of 24 (=20) M1 for calculating $\frac{3}{4}$ of 'x' and $\frac{5}{6}$ of 'x' correctly with a common 'x' eg $\frac{3}{4}$ of 24 = 18 and $\frac{5}{6}$ of 24 =20 C1 for correct conclusion with supportive evidence (dep M1 and comparison of $\frac{3}{4}$ of 'x' and $\frac{5}{6}$ of 'x')
11	(a)	24 × 2 =48 48 × 2 =96	96	1	B1 cao
	(b)		35	1	B1 cao
	(c)(i)		74 + 62 or 62 + 74 or 72 + 64 or 64 + 72	1	B1 cao
	(ii)		136	1	B1 for 136 or ft from (a) for their total as long as 6 or 7 seen as the first digit of at least one 2 digit number in (a) and 2, 4, 6, 7 used

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)(i)		(4,6)	1	B1 cao
	(ii)		(6,–4)	1	B1 cao
	(b)		Trapezium	1	B1 cao
13	(a)(i)		18	1	B1 cao
	(ii)		add 4 (each time)	1	B1 for a correct reason, e.g. add 4 (each time) (accept goes up in 4s)
	(b)		26	1	B1 cao
	(c)		Yes and reason	1	B1 Yes, because $4 \times 9 - 2 = 34$ or $2 + 4 \times 8 = 34$ or sequence continued to at least 34 or 2 + 4 + 4 + 4 + 4 + 4 + 4 + 4+ 4 or or building up from previous term found, eg because after 26 you could add four two more times
14	(a)		Circle radius 4 cm drawn	2	M1 for an accurately drawn circle of any radius or attempt to draw a circle of radius 4 cm which has the ends of any diameter between the two circles on the overlay A1 for circle within overlay (4cm ± 2mm) (any centre may be used)
	(b)		Diameter drawn	1	B1 correct placement of diameter

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		(1 A) (2 A) (6 A) (1 C) (2 C) (6 C) (1 E) (2 E) (6 E)	2	B2 for all 9 (no extras, ignore repeats) (B1 for at least 5 correct)
	(b)		$\frac{1}{9}$	2	M1 ft from (a) for denominator of '9' or numerator of 'number of outcomes including 2 and E' seen A1 cao OR M1 for $\frac{1}{3} \times \frac{1}{3}$ A1 cao
16	(a)		Red	1	B1 cao
	(b)		$\frac{1}{6}$	1	B1 cao
	(c)	$\frac{1+3}{6}$	$\frac{4}{6}$	2	M1 1 + 3 or 4 seen A1 $\frac{4}{6}$ oe

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
17			$\frac{1}{4}$, 0.5, $\frac{2}{3}$,1, $\frac{6}{5}$	2	M1 for using a common denominator for all numbers, eg 60, at least one number correct A1 for correct order OR M1 for changing all numbers to decimals (at least 1dp) or % (at least 2sf) with at least one of $\frac{1}{4}$ $\frac{2}{3}$ $\frac{6}{5}$ correct A1 for correct order Answer can be written with original fractions or any equivalent form SC B1 for 3numbers in the correct position or for all numbers listed correctly from highest to lowest
18	(a)		3	1	B1 cao
	(b)		4	1	B1 cao
	(c)	$a = \frac{(1+5)}{3}$	2	2	M1 for $a = \frac{(1+5)}{3}$ or $3a$ = '1 + 5' or intention to add 5 to each side or intention to divide both sides by 3 A1 cao
	(d)		32	1	B1 cao

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)		4	1	B1 cao
	(b)	14 – 4 –8 = 2	2	3	M1 for 4 × 2 (=8) blue counters M1 for 14 – "8" – 4 or 10 – "8" A1 cao OR M1 for P(B) = $2 \times \frac{4}{14}$ oe (= $\frac{8}{14}$ oe) M1 for $1 - \frac{"8"}{14} - \frac{4}{14}$ oe or P(Y)= $\frac{2}{14}$ oe or $\frac{2}{14} \times 14$ oe A1 cao
20	(a)		A and D	2	B2 both correct (B1 for 1 correct)
	(b)		A	1	B1 cao
	(c)		'Vertical' line through the centre and a 'horizontal' line through the centre.	1	B1 cao

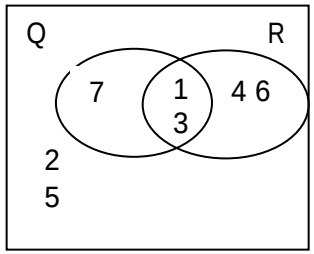
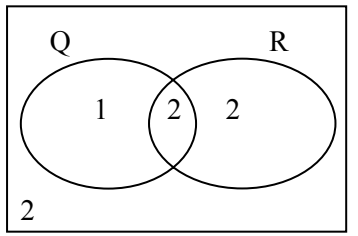
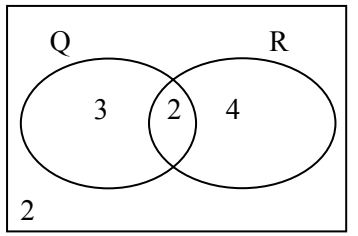
5MM1F_01

Question		Working	Answer	Mark	Notes
21	(a)(i)		–28	2	B1 cao
	(ii)		15		B1 cao
	(b)	254 23 × 762 5080 5842	5842	3	M1 for a complete method with relative place value correct. Condone one multiplication error, addition not necessary OR M1 for complete grid. Condone one multiplication error, addition not necessary OR M1 for sight of complete partitioning method. Condone one multiplication error. Final addition not necessary M1 (dep) for addition. Condone one addition error A1 cao (SC B1 for attempting to add 23 lots of 254)

×	200	50	4
20	4000	1000	80
3	600	150	12

4000 + 1000 + 600 + 150 + 80 + 12

	2	5	4	
	0 / 4	1 / 0	0 / 8	2
	0 / 6	1 / 5	1 / 2	3
5	8	4	2	

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
22				4	M1 for an attempt at classification, eg by writing Q in an appropriate shape or writing an appropriate shape number next to set Q M1 for placement of any shape number in the Venn diagram A1 for shape numbers in sets Q and R correctly placed A1 for 2 and 5 outside of Q and R SC B2 for giving correct number of elements in each part of Venn diagram.  SC B1 for 

5MM1F_01

Question		Working	Answer	Mark	Notes
23	(i)	<table><tr><td>+</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr><tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr></table>	$\frac{1}{18}$	6	M1 for listing / identifying the 2 outcomes (5,6) and (6,5) or $(\frac{1}{6} \times \frac{1}{6}) + (\frac{1}{6} \times \frac{1}{6})$ A1 for $\frac{2}{36}$ oe
	(ii)		Incorrect and reason		M1 for identifying there are 36 outcomes, eg 36 seen or outcomes listed or shown in a table (can be earned in (i)) M1 for attempt to list or find the number of outcomes giving a total of 5 or more (allow one error, omission or extra outcome),eg 30 (or 29 or 31) seen or outcomes listed or identified in table A1 $\frac{30}{36}$ oe C1 (dep M2) for conclusion that Savio is incorrect with supportive evidence (including clear reference to their probability for a total of 5 or more) Alternative M1 for identifying there are 36 outcomes eg 36 seen or outcomes listed or shown in a table (can be earned in (i)) M1 for outcomes giving a total of <u>less</u> than 5 eg 6 total outcomes, outcomes listed or identified in table A1 $\frac{30}{36}$ oe C1 (dep M2) for conclusion that Savio is incorrect with supportive evidence (including clear reference to their P(5 or more) or comparison of P(less than 5) with ¼ oe)

5MM1H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
24	(a)	2 –1 0 1 2 3 4 1 3 5 7 9 11 13 Or Using $y = mx + c$, gradient =2, y intercept = 5		3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x M1 (dep) ft for plotting at least 2 of their points (any points plotted from their table must be correct) A1 for correct line between -2 and 4 **(No table of values)** M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $y - 2x = 5$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points with no more than 2 incorrect points) A1 for correct line between -2 and 4 **(Use of $y=mx+c$)** M2 line segment of $y - 2x = 5$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 2 OR line drawn with a y intercept of 5 and a positive gradient) A1 for correct line between -2 and 4
	(b)(i)		4		B1 Allow 3.8 to 4.2 inclusive either by substitution or ft from a straight line segment (± 2mm)
	(ii)		1.6		B1 Allow 1.4 to 1.8 inclusive either by substitution or ft from a straight line segment (± 2mm) Note: Condone alternative or additional value − 1.4 to − 1.8 inclusive ft from straight line segments

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
25	(i)		$\frac{8}{40}$	1	B1 $\frac{8}{40}$ oe
	(ii)	$\frac{1}{40} + \frac{9}{40}$	$\frac{10}{40}$	3	M1 for $\frac{1}{40}$ or $\frac{9}{40}$ or 1 + 9 (=10) M1 for $\frac{1}{40} + \frac{9}{40}$ A1 for $\frac{10}{40}$ oe Note: Award 0 marks for $\frac{2}{8}$ without working in (ii) if $\frac{1}{8}$ seen in (i)

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Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Foundation Tier

Monday 13 June 2011 – Afternoon
Time: 1 hour 45 minutes

Paper Reference
5MM1F/01

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used**.



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P38955A

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6/6/6/6/6

P 3 8 9 5 5 A 0 1 2 4

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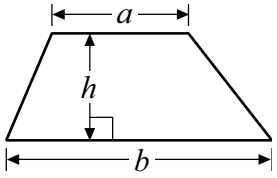
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GCSE Mathematics 2MM01

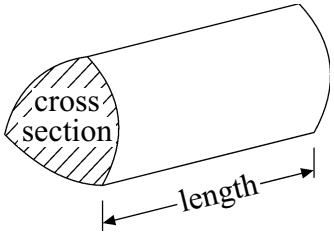
Formulae: Foundation Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



Volume of prism = area of cross section × length



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Answer ALL Twenty Three questions.

Write your answers in the spaces provided.

You must NOT use a calculator.

You must write down all stages in your working

1 (a) Write the number **fifteen thousand two hundred and four** in figures.

.....

(1)

(b) Write the number 3076 in words.

.....

(1)

(c) Write down the value of the figure **3** in the number 23 519

.....

(1)

(d) What is 45 261when rounded to the nearest hundred?

.....

(1)

(e) Write 7215 correct to **two** significant figures.

.....

(1)

(Total for Question 1 is 5 marks)

2 (a) (i) On the grid below draw a triangle with **two** equal sides.

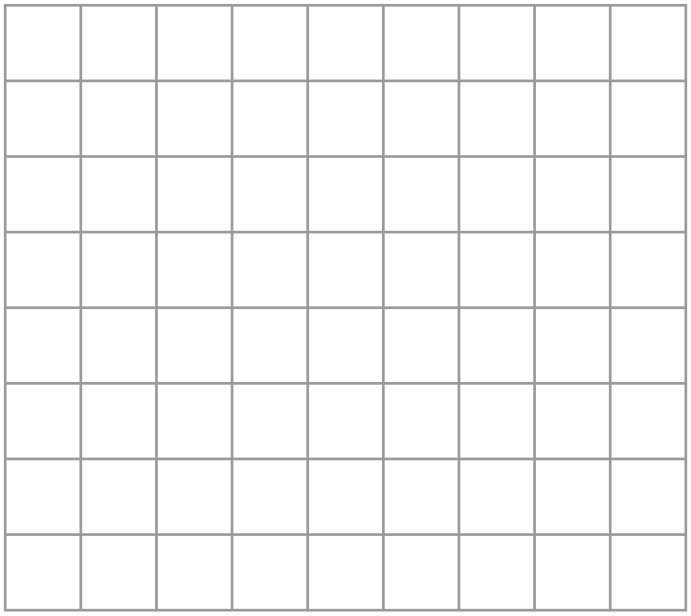


(ii) Write down the name of the type of triangle you have drawn.

..... triangle

(2)

(b) (i) On the grid below draw a quadrilateral that has one pair of parallel sides.



(ii) Write down the name of the type of quadrilateral you have drawn.

.....

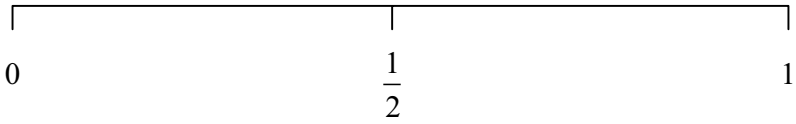
(2)

(Total for Question 2 is 4 marks)

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3 (a) Rachel throws a fair coin.

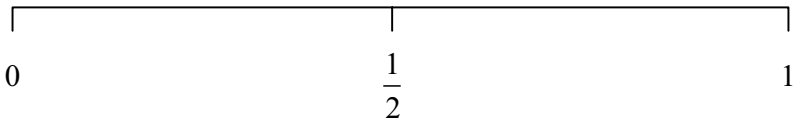
On the probability scale, mark with a cross (×), the probability the coin will land on heads.



(1)

(b) Chris throws an ordinary 6-sided dice numbered from 1 to 6

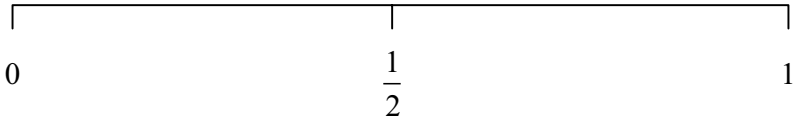
On the probability scale, mark with a cross (×), the probability an 8 will be thrown.



(1)

(c) In a bag, there are four red sweets and six green sweets.
Bill takes at random a sweet from the bag.

On the probability scale, mark with a cross (×), the probability he will take a green sweet.



(1)

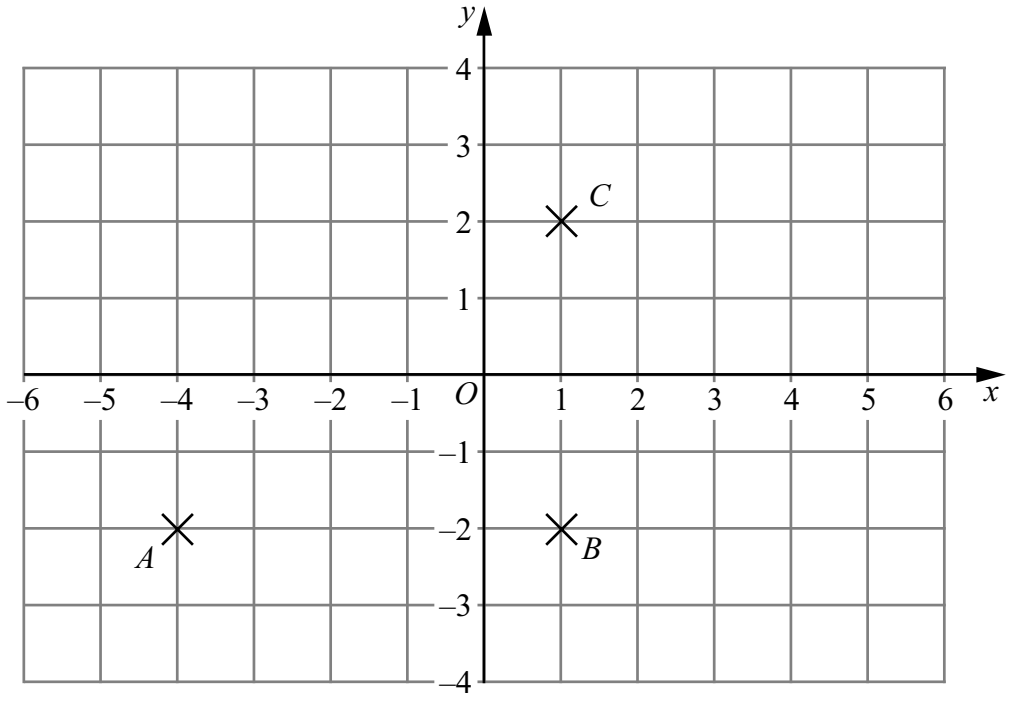
(Total for Question 3 is 3 marks)

4 Find **four different** prime numbers you can add together to get a number greater than 30 and less than 40

....

(Total for Question 4 is 3 marks)

5 Here is a grid of centimetre squares.



(a) Write down the coordinates of the points

(i) C

.....

(ii) A

.....

(2)

$ABCD$ is a rectangle.

(b) (i) On the grid, mark with a cross (×) the point D so that $ABCD$ is a rectangle.

(ii) Write down the coordinates of D.

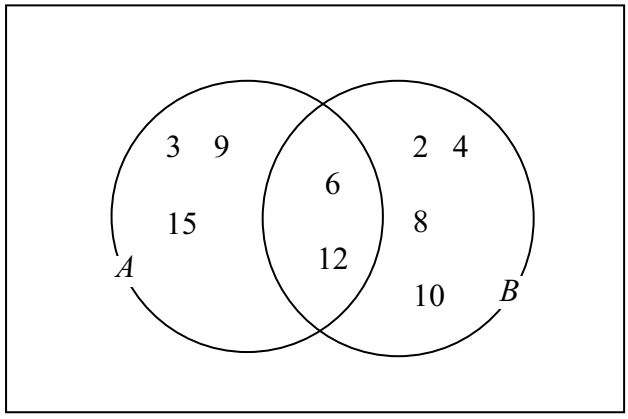
.....

(2)

(Total for Question 5 is 4 marks)

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6 Here is a Venn diagram.



(a) Write down the numbers that are in set A.

.....

(2)

(b) Write down the numbers that are in both set A **and** set B.

$A \cap B =$ .....

(1)

(Total for Question 6 is 3 marks)

7

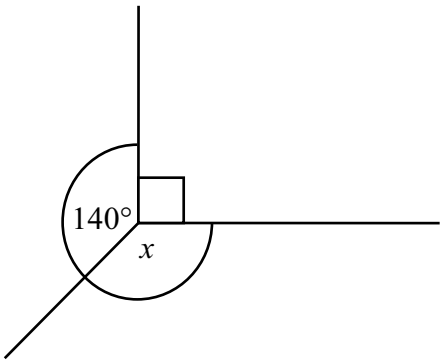


Diagram **NOT** accurately drawn

(a) Write down the name of the type of angle marked x.

.....

(1)

(b) (i) Work out the size of the angle marked x.

..... °

(ii) Give a reason for your answer.

.....

(3)

(Total for Question 7 is 4 marks)

8 Here are some patterns made from sticks.



Pattern number 1 Pattern number 2 Pattern number 3

(a) Draw Pattern number 4

(1)

(b) Complete the table

Pattern number	Number of sticks
1	4
2	7
3	10
4	.....
10	.....
.....	76

(3)

(c) Find an expression, in terms of n, for the number of sticks needed for Pattern number n.

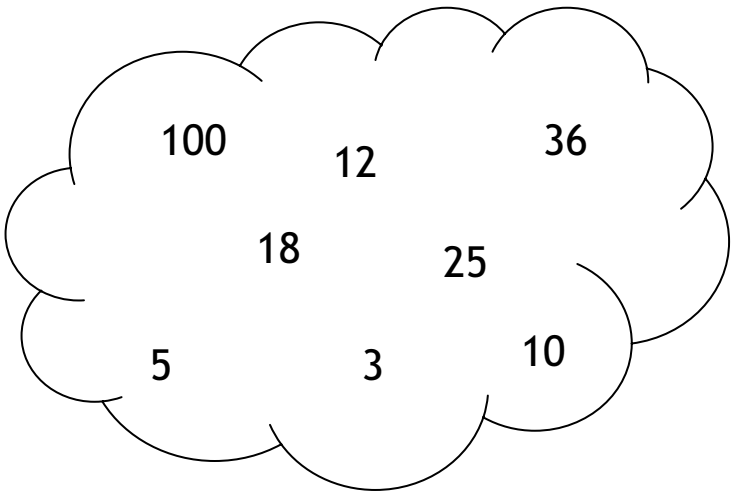
.....

(2)

(Total for Question 8 is 6 marks)

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9



From the numbers in the cloud, write down

(a) the square of 6

.....

(1)

(b) the value of $\sqrt{100}$

.....

(1)

(c) a multiple of 5

.....

(1)

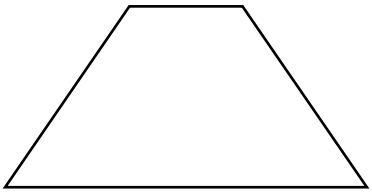
(d) a factor of 24

.....

(1)

(Total for Question 9 is 4 marks)

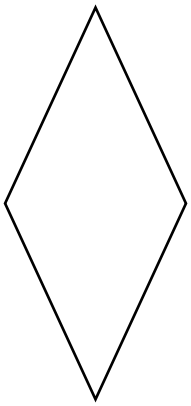
10 Here are five shapes.



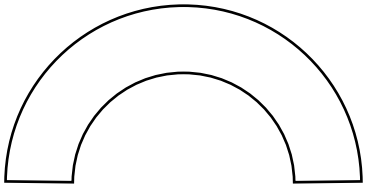
A



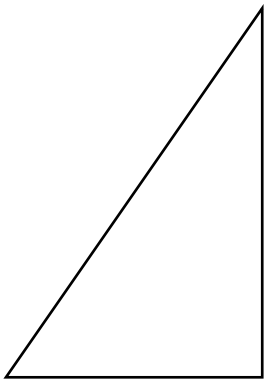
B



C



D



E

Two of these shapes have only **one** line of symmetry.

(a) Write down the letter of each of these **two** shapes.

..... and .....

(2)

Two of these shapes have rotational symmetry of order 2

(b) Write down the letter of each of these **two** shapes.

..... and .....

(2)

(Total for Question 10 is 4 marks)

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11 There are 20 counters in a box.

5 counters are red.
4 counters are green.
The rest of the counters are blue.

Hajra takes at random one of the counters from the box.

What is the probability that she takes

(i) a red counter,

.....

(ii) a blue counter,

.....

(iii) a counter that is not green?

.....

(Total for Question 11 is 5 marks)

12 (a) Simplify $x + x + x$

.....

(1)

(b) Simplify $4y + 3y - 2y$

.....

(1)

(c) Simplify $5p + 6r - p - 8r$

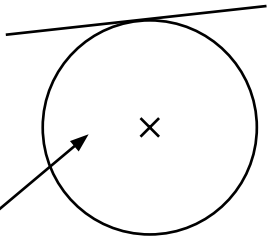
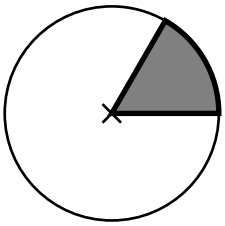
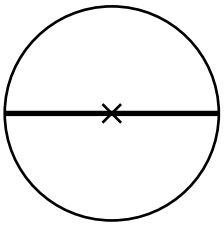
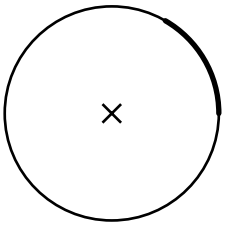
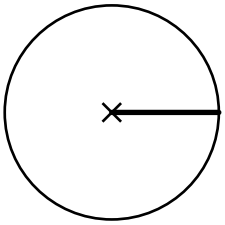
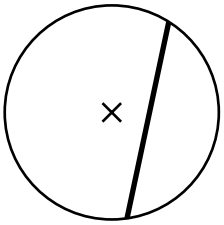
.....

(2)

(Total for Question 12 is 4 marks)

13 Here are 6 diagrams and 6 labels.
In each diagram the centre of the circle is shown with a cross (×).

Match each diagram to its label.
One has been done for you.

Label	Diagram
Circle and diameter	
Circle and radius	
Circle and tangent	
Circle and chord	
Circle and arc	
Circle and sector	

(Total for Question 13 is 4 marks)

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14 (a) Work out 374 × 53

.....

(3)

(b) Work out 9798 ÷ 46

.....

(3)

(Total for Question 14 is 6 marks)

15 (a) Work out $2 + 3 \times 5$

.....

(1)

(b) Work out $18 \div 2 + 4$

.....

(1)

(c) Work out 4.575×100

.....

(1)

(d) Work out 2×3^2

.....

(1)

(e) Work out -5×-4

.....

(1)

(Total for Question 15 is 5 marks)

---

16 (a) Write these numbers in order of size.
Start with the smallest number.

63 97 59 88 72 90

.....

(1)

(b) Write these numbers in order of size.
Start with the smallest number.

5.2 0.52 0.025 0.91 0.019

.....

(1)

(c) Write these numbers in order of size.
Start with the smallest number.

0 2 –5 –2 3 –0.5

.....

(1)

(Total for Question 16 is 3 marks)

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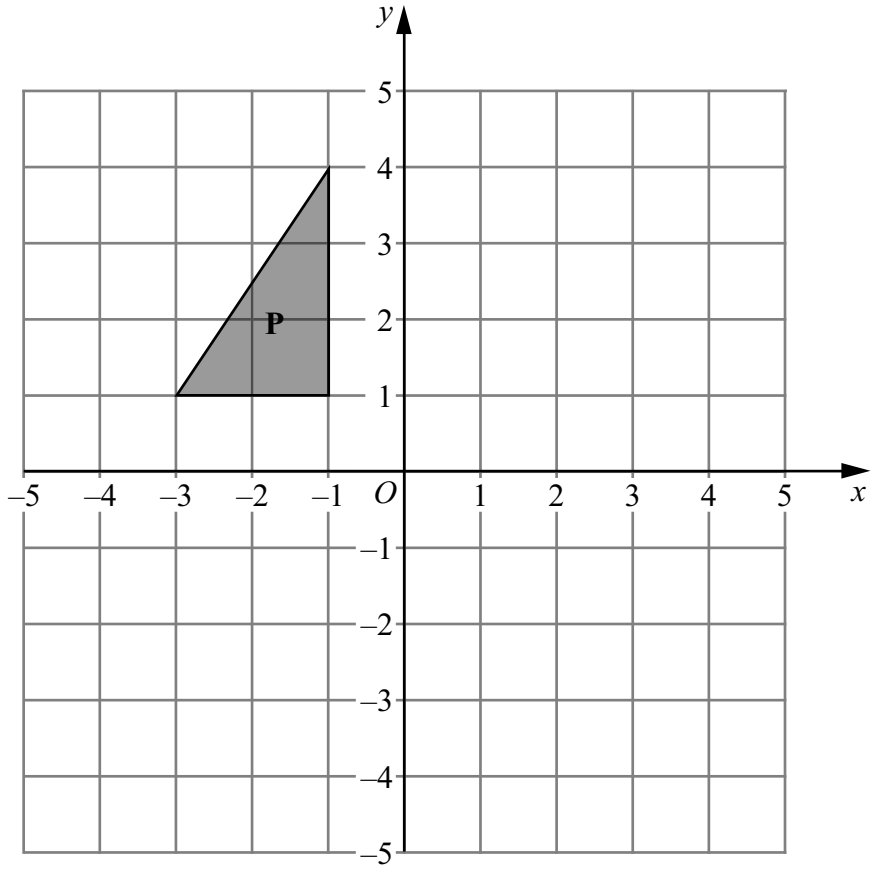
***17** Which of these fractions is the larger?

$$\frac{2}{3} \quad \text{or} \quad \frac{3}{5}$$

You must show clearly how you got your answer.

(Total for Question 17 is 3 marks)

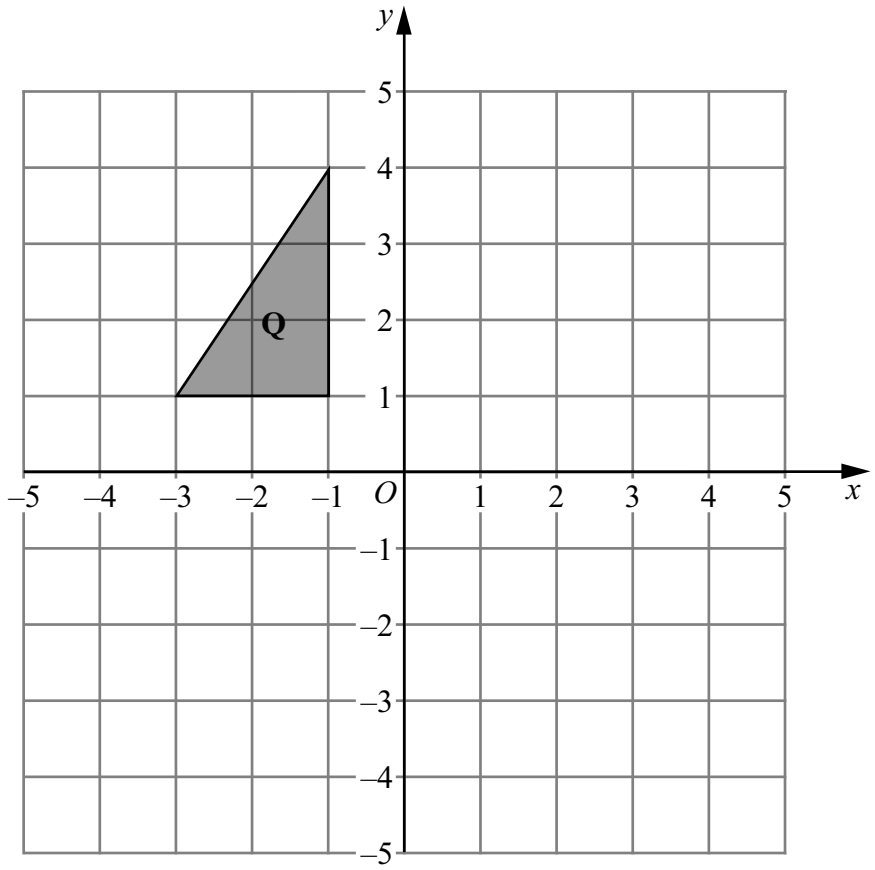
18



(a) Reflect triangle **P** in the x axis.

(2)

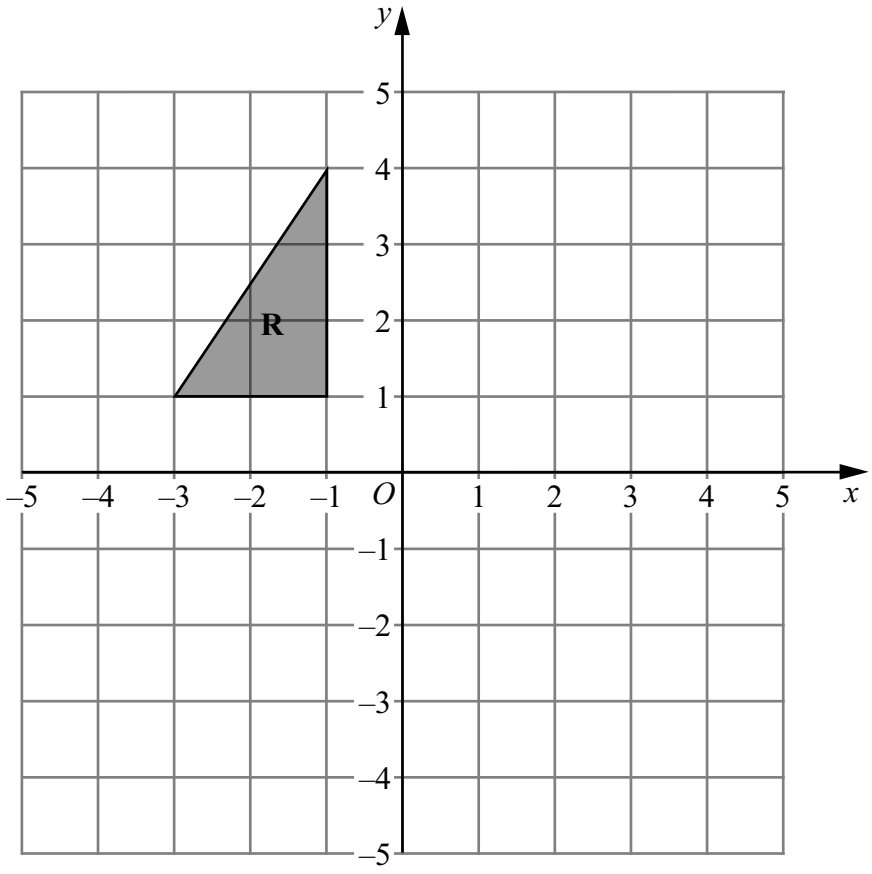
(b) Translate triangle **Q** by vector $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$.



(2)

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(c) Rotate triangle **R** 180° centre (0, 2).

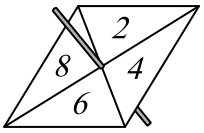


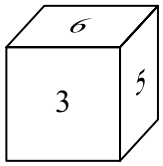
(2)

(Total for Question 18 is 6 marks)

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19 Jim has a fair 4-sided spinner numbered 2, 4, 6 and 8 and a fair 6-sided dice.





He spins the spinner once and rolls the dice once.
To get the score he **multiplies** the numbers together.

(i) Work out the probability the score will be 2

.....

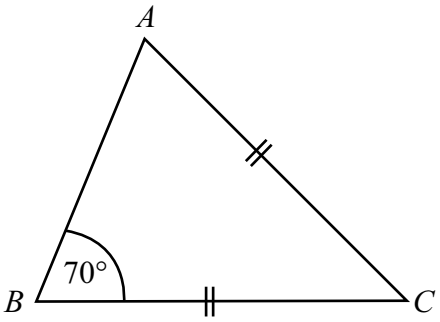
(ii) Work out the probability the score will be more than 30

.....

(Total for Question 19 is 5 marks)

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***20**



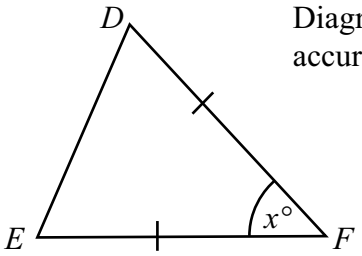


Diagram **NOT** accurately drawn

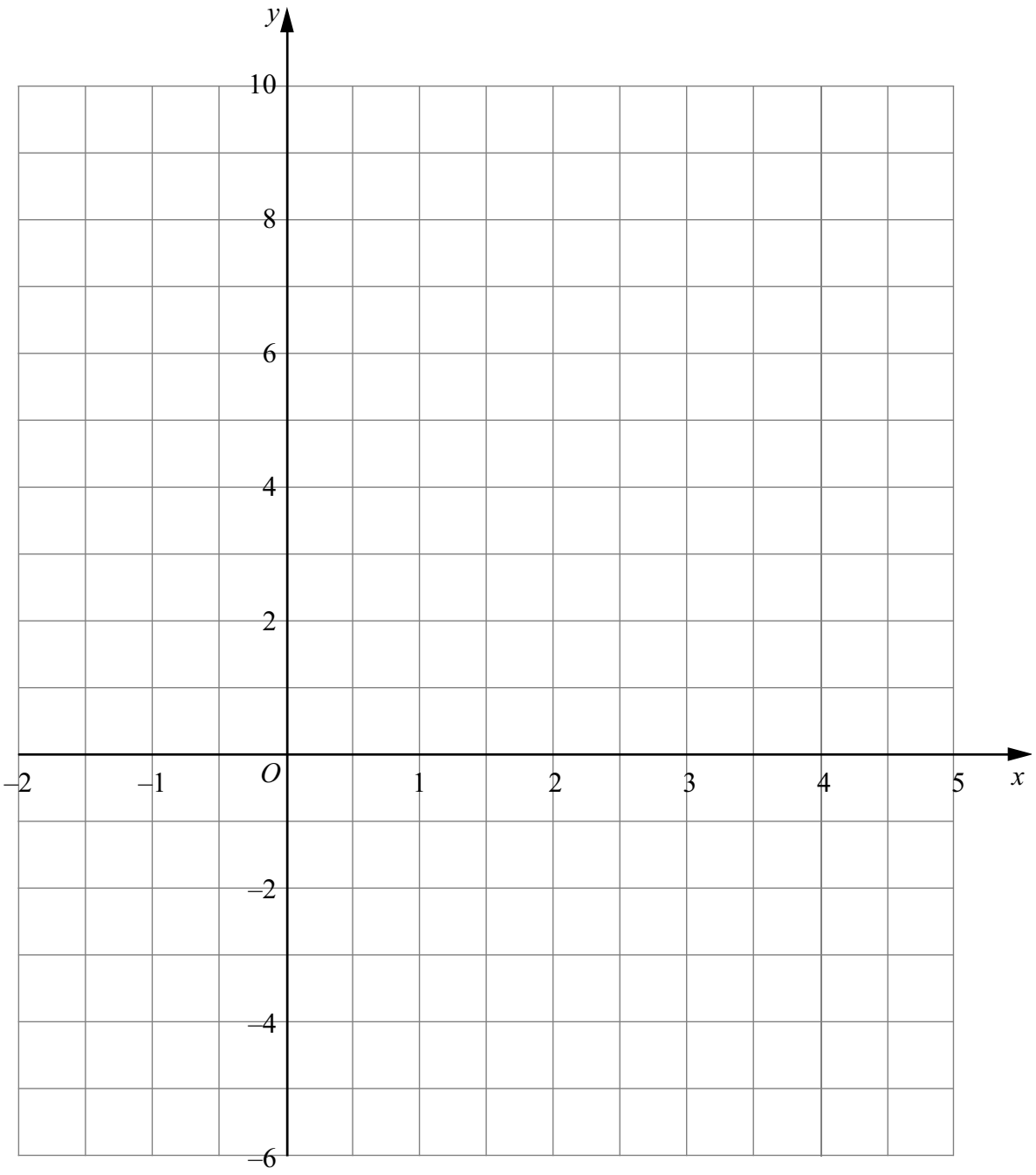
Triangle *ABC* is an isosceles triangle.
Angle *B* = 70°.
AC = *BC*.

Triangle *ABC* is similar to triangle *DEF*.

Find the value of the angle marked *x*°.
Give reasons for your answer.

(Total for Question 20 is 4 marks)

21 On the grid draw the graph of $y = 2x - 3$



(Total for Question 21 is 3 marks)

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22 Here is a trapezium.

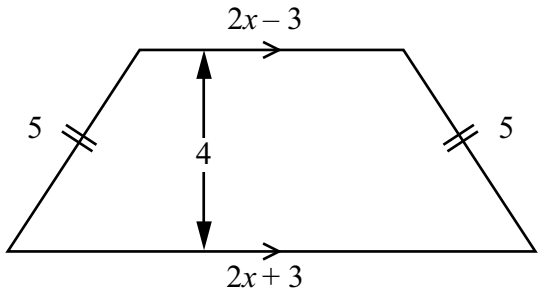


Diagram **NOT** accurately drawn

All the measurements are in cm.

The area of the trapezium is 18 cm^2.

Calculate the numerical value of the perimeter of the trapezium.

..... cm

(Total for Question 22 is 6 marks)

23 Here is some information about a cricket and tennis club.

80 people belong to the club.
35 play cricket.
50 play tennis.
15 play both cricket and tennis.

(a) Draw a Venn diagram to show this information.

(4)

One of the people that belongs to the club is chosen at random.

(b) Work out the probability that this person does not play cricket or tennis.

.....

(2)

(Total for Question 23 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

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Mark Scheme (Results)

June 2011

Methods in Mathematics (GCSE)
Unit 1: Methods 5MM1F_01

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

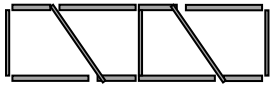
13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		15 204	1	B1 cao
	(b)		Three thousand and seventy six	1	B1 ignore spellings
	(c)		3000	1	B1 accept mixture of digits and words for correct answer
	(d)		45 300	1	B1 cao
	(e)		7200	1	B1 cao
2	(a)		Isosceles triangle drawn	2	B1 for drawing a triangle with 2 equal sides B1 for isosceles (ignore spelling) ft from their triangle
	(b)		trapezium drawn	2	B1 for drawing an trapezium B1 for trapezium (ignore spelling) ft from their quadrilateral
3	(a)		x marked at ½	1	B1 for x marked between ⅜ and ⅝
	(b)		x marked at 0	1	B1 for x marked near 0
	(c)		x marked at 0.6	1	B1 for x marked between ½ and ¾
4		e.g. 2, 3, 5, 29 2, 3, 5, 23 2, 3, 13, 17	Sum of 4 primes	3	M1 for finding at least 2 prime numbers M1 for 4 numbers with a total between 30 and 40 with at least 2 primes A1 for a fully correct solution

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)(i)		(1, 2)	2	B1 cao
	(ii)		(-4,- 2)		B1 cao
	(b)(i)		D marked on grid	2	B1 D correctly marked on grid
	(ii)		(–4, 2)		B1 for (–4, 2) ft from their D marked
6	(a)		3, 6, 9, 12, 15	2	M1 for writing down at least one number from set *A* with no incorrect responses. A1 cao
	(b)		6, 12	1	B1 cao
7	(a)		Obtuse	1	B1 for obtuse (ignore spelling)
	(b)(i)	360 – (140 + 90)	130	3	M1 for 360 – (140 + 90) or 360 – 230 A1 cao
	(ii)		Angles at a point = 360º		B1 for **angles** at a **point** add to **360º**

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)			1	B1 cao
	(b)	4 13 10 31 25 76	13 31 25	3	B3 all three entries correct or ft "13" with 31 and 25 [B1 one correct entry, ft "13"]
	(c)		$3n + 1$	2	M1 for $3n + a$ where a is an integer $\neq 1$ or n=3n+1 A1 for $3n + 1$
9	(a)		36	1	B1 cao
	(b)		10	1	B1 cao
	(c)	5, 20, 25 and 100 are all multiples	5, 10, 25 or 100	1	B1 for any one from 5, 10, 25 or 100
	(d)	3 and 12 are both factors	3 or 12	1	B1 for any one from 3 or 12
10	(a)		A and D	2	B2 for both correct (B1 for one correct)
	(b)		B and C	2	B2 for both correct (B1 for one correct)

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(i)		$\frac{1}{4}$	1	B1 accept $\frac{5}{20}$
	(ii)	20 – (5 + 4) = 11	$\frac{11}{20}$, 0.55, 55%	2	M1 for 20 – (5 + 4) or 11 seen or for $\frac{n}{20}$ where $n <$ 12 A1 for $\frac{11}{20}$ oe (eg. 55%, 0.55, $\frac{55}{100}$)
	(iii)	20 – 4 = 16 OR $\frac{5}{20} + \frac{11}{20}$	$\frac{4}{5}$, 0.8, 80%	2	M1 for $\frac{20-4}{20}$ or $1-\frac{4}{20}$ or $\frac{5}{20} + \frac{'11'}{20}$ A1 for $\frac{16}{20}$ oe [SC: B1 for 16 to 20 or 16:20 or 16 out of 20 oe if M0 scored] ft from (i) and (ii) '$\frac{5}{20}$'+'$\frac{11}{20}$,
12	(a)		$3x$	1	B1 cao
	(b)		$5y$	1	B1 cao
	(c)		$4p - 2r$	2	M1 for $4p$ or $-2r$ A1 cao
13			Correct lines drawn	4	B4 for all 5 correct B3 for 3 or 4 correct B2 for 2 correct B1 for 1 correct

5MM1F_01

Question		Working	Answer	Mark	Notes
14	(a)	374 53 × 1122 18700 19822 × | 300 | 70 | 4 50 | 15000 | 3500 | 200 3 | 900 | 210 | 12 15 000 + 3500 + 200 + 900 + 210 + 12 = 19 822 | 3 | 7 | 4 | 1 | 15 | 35 | 20 | 5 9 | 9 | 21 | 12 | 3 8 | 2 | 2	19 822	3	M1 for complete method for multiplying 374 by 3 and 50 condone one error in multiplication M1 (dep) for addition, condone one addition error A1 cao Alternative M1 for complete method for multiplying 300, 70 and 4 by 3 and 50 condone one error in multiplication M1 (dep) for addition, condone one addition error A1 cao Alternative M1 for complete method for multiplying 3, 7 and 4 by 3 and 5 condone one error in multiplication M1 (dep) for addition, condone one addition error A1 cao

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
14	(b)	213 46)9798 92 59 46 138 138 0 9798 4600 – 100 5198 4600 – 100 598 460 – 10 138 46 – 1 92 46 – 1 46 46 – 1 0 200 + 10 + 3 2 1 3 46)97 ^{5}9 ^{13}8	213	3	M1 for method that establishes 97 ÷ 46 = 2 M1 for a complete method that deals with remainders, condone one arithmetic error A1 cao Alternative M1 for method that establishes the subtraction of a multiple of 46 or addition of multiples of 46 M1 for a complete method that could lead to the correct answer, condone one arithmetic error A1 cao

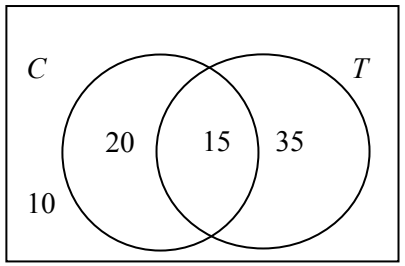
5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		17	1	B1 cao
	(b)		13	1	B1 cao
	(c)		457.5	1	B1 cao
	(d)		18	1	B1 cao
	(e)		20	1	B1 cao
16	(a)		59, 63, 72, 88,90, 97	1	B1 cao
	(b)		0.019, 0.025, 0.52, 0.91, 5.2	1	B1cao
	(c)		–5, –2, – 0.5, 0, 2, 3	1	B1 cao
*17		Shading 10 squares out of 15 Shading 9 squares out of 15 2/3 = 2 ÷ 3 = 0.666… 3/5 = 3 ÷ 5 = 0.6 $\frac{2}{3} = \frac{10}{15}$ $\frac{2}{3} = \frac{9}{15}$	$\frac{2}{3}$	3	M1 for shading 10 squares for 2/3 M1 for shading 9 squares for 3/5 C1 for correct conclusion from their working **or** M1 for writing 2/3 as 0.666… M1 for writing 3/5 as 0.6 C1 for correct conclusion from their working **or** M1 for attempt to write 2/3 or 3/5 with a common denominator A1 for writing 2/3 and 3/5 correctly with common denominator C1 for correct conclusion from their working

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)		Triangle with vertices: (-3, -1), (-1, -1) and (-1, -4)	2	M1 for a reflection in a horizontal or vertical line A1 for correct reflection
	(a)		Triangle with vertices: (3, 1), (3, -2) and (1, -2)	2	M1 for any translation A1 for correct translation
	(b)		Triangle with vertices: (1, 3), (3, 3) and (1, 0)	2	B2 cao for a correct rotation [B1 for a rotation of of 180º about any point OR for a correct rotation of 90º clockwise or anticlockwise about the point (0, 2)]
19	(i)	× | 1 2 3 4 5 6 2 | 2 4 6 8 10 12 4 | 4 8 12 16 20 24 6 | 6 12 18 24 30 36 8 | 8 16 24 32 40 48 OR $\frac{1}{4} \times \frac{1}{6}$	$\frac{1}{24}$	5	M1 for identifying 2 and 1 or 2 × 1 (= 2) M1 for 24 seen OR an attempt to get the 24 outcomes or an attempt at a sample space or a list of possibilities or a list of ordered pairs [at least 12 correct; outcomes , possibilities, ordered pairs must be shown (ignore incorrect extras)] A1 for 1/24 oe OR M2 for $\frac{1}{4} \times \frac{1}{6}$ (M1 for $\frac{1}{4}$ or $\frac{1}{6}$ seen) A1 for 1/24 oe

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(ii)		$\frac{4}{24} = \frac{1}{6}$		M1 ft from their ordered list from part (i) for identifying at least one possible score from; 8×4 (=32), 6×6 (=36), 8×5 (=40) or 8×6 (=48), condone the inclusion of pairs reversed; eg. 4×8, 6×8 and 5×8 [accept the inclusion of 6×5 (=30) as a misread] [accept an answer of $\frac{5}{24}$, for M1, ONLY if the 5 outcomes are selected in either part (i) or part (ii)] A1 for 4/24 oe
20		180 – (70 + 70) 180 – 140	40º	4	M1 for identifying two correct equal 70º angles in either triangle M1 for 180 – (70 + 70) A1 for angle $C = 40^{o}$ or $F(x) = 40^{o}$ C1 for x = "40º" 'because the ***triangles*** are ***similar***' or 'one triangle is an ***enlargement*** of the other' **and** either 'base ***angles*** of an ***isosceles*** triangle are ***equal***' or 'sum of the ***angles*** in a ***triangle*** is ***180º***' oe

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
21		$y = 2x - 3$ x -1 0 1 2 3 4 5 y -5 -3 -1 1 3 5 7	Correct line from (–1, −5) to (4, 5)	3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x M1 for plotting at least 2 of their points (if more than two points are plotted, condone one plotting error) A1 for the correct line from (–1, −5) to (4, 5) OR **(No table of values)** M2 for at least 2 correct points (and no incorrect points) correctly plotted or M2 for a line segment of the graph of $y = 2x - 3$ drawn (ignore any additional incorrect line segments) [M1 for at least 3 correct points plotted with no more than 2 incorrect points] A1 for the correct line from (–1, −5) to (4, 5) OR **(Use of $y = mx + c$)** M2 for a single straight line of gradient 2, passing through the point (0, −3) (M1 for a single straight line of gradient 2 or for a single straight line passing through the point (0, −3)) A1 for the correct line from (–1, −5) to (4, 5)

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
22		$(2x – 3 + 2x + 3) \div 2 \times 4 = 18$ $8x = 18$ $x = 2.25$ $P = 2x – 3 + 2x + 3 + 5 + 5$ $P = 4x + 10$ $P = 9 + 10$ OR $2 \times 2.25 – 3 = 1.5$ $2 \times 2.25 + 3 = 7.5$ $5 + 5 + 1.5 + 7.5$	19 cm	6	M1 for $(2x – 3 + 2x + 3) \div 2 \times 4$ oe M1 for equating "$(2x – 3 + 2x + 3) \div 2 \times 4$" = 18 A1 cao $x = 2.25$ oe (eg. $\frac{18}{8}$) M1 (indep) $2x – 3 + 2x + 3 + 5 + 5$ (= 4x + 10) oe M1 (dep) for substituting "x" into an expression for the perimeter A1 cao OR M1 for $2 \times$ '2.25' – 3 (= 1.5) or $2 \times$ '2.2'5 + 3 (= 7.5) M1 for 5 + 5 + '1.5' + '7.5' [Note: the '2.25' must be the solution of an algebraic equation for their attempt at the area of the trapezium] A1 cao

5MM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
23	(a)			4	B1 for 15 shown in the intersection of two sets M1 for an attempt to show 35 – 15 or 50 – 15 in the correct place on the Venn Diagram. M1 for 80 – [“20” + 15 + “35”] (= 10), this may be implied from their numbers in the diagram A1 for a fully correct and labelled diagram [condone omission of the surrounding box]
	(b)		$\frac{1}{8}$	2	M1 for identifying “10” outside of C and T A1 ft for $\frac{'10'}{80}$ o.e.

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