

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4–5	
6–7	
8–9	
10	
TOTAL	



General Certificate of Secondary Education
Foundation Tier
June 2011

Methods in Mathematics (Linked Pair Pilot)

93651F/A

Unit 1 Algebra and Probability
Section A Calculator

F

Monday 13 June 2011 9.00 am to 9.45 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments. 	
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Time allowed

- 45 minutes

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- This paper is divided into two sections: Section A and Section B.
- After the 45 minutes allowed for Section A, you must put your calculator on the floor under your seat. You will then be given Section B.
- When you have answered Section B you may work again on Section A but you must **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 40.
- The quality of your written communication is specifically assessed in Questions 2 and 9.
These questions are indicated with an asterisk (*)
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

Advice

- In all calculations, show clearly how you work out your answer.



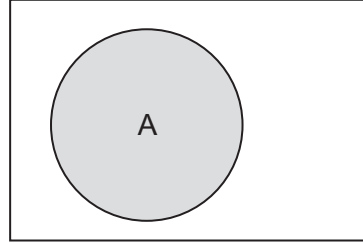
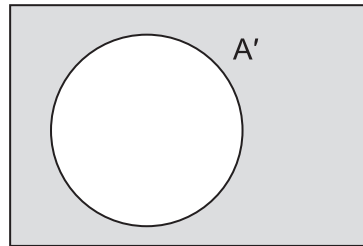
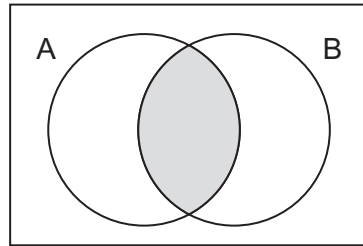
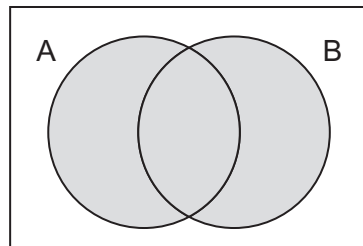
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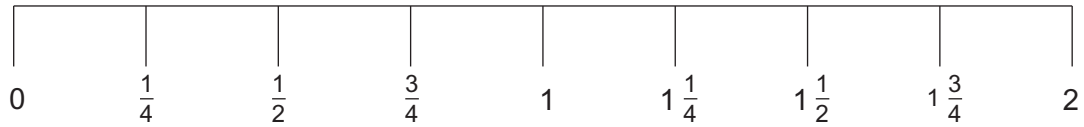
Formulae Sheet: Foundation Tier

Set notation

 A  A'  $A \cap B$  $A \cup B$ 

Answer **all** questions in the spaces provided.

1 This is part of a number line.



1 (a) Which number on the line has the same value as 0.25?

Answer (1 mark)

1 (b) Which number on the line has the same value as $\frac{3}{2}$?

Answer (1 mark)

1 (c) Which number on the line is half-way between 0 and $1\frac{1}{2}$?

Answer (1 mark)

1 (d) Mark on the number line the position of $1\frac{1}{3}$ (1 mark)

1 (e) Write as a decimal the number half-way between 0 and $\frac{1}{4}$

.....

Answer (1 mark)



***2** Jack buys 6 cakes for £4.
Two of them are cupcakes.
Each cupcake costs 60p.
The others are cream cakes.
What is the cost of **one** cream cake?

.....
.....
.....

Answer (4 marks)

3 Complete the following sentences.

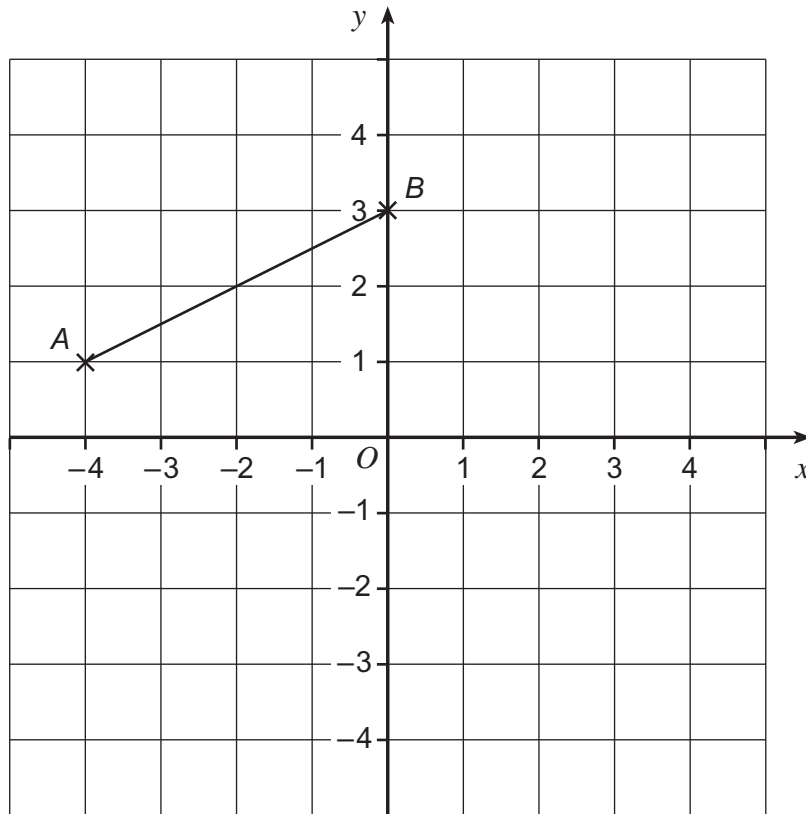
3 (a) 4 is the square of (1 mark)

3 (b) 4 is the square root of (1 mark)

3 (c) 4 is the cube root of (1 mark)



4 Here is a coordinate grid.



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

Answer (.....,)

(1 mark)

4 (b) The point C lies on the line AB.
The x coordinate of C is -3 .

Mark the point C on the grid.

(1 mark)

4 (c) The coordinates of the point (2, 3) add up to 5.

Write down a point with coordinates that add up to zero.

Answer (.....,)

(1 mark)



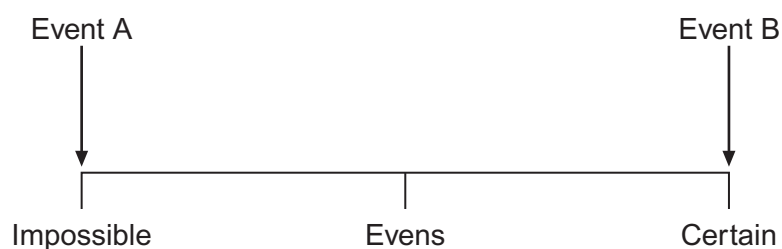
- 5** A bag contains 100 balls numbered 1 to 100.
The balls with even numbers are blue.
The balls with odd numbers are yellow.
A ball is taken from the bag at random.

- 5 (a)** Match up each of the events with the chance of it happening.
The first one is done for you.

Event	Chance of happening
The number on the ball is odd	Impossible
The number on the ball is 29	Unlikely
The ball is blue	Evens
The number on the ball is greater than 10	Likely
	Certain

(2 marks)

- 5 (b)** Write down **two** events which fit the probability scale.



Event A The ball taken from the bag is

Event B The ball taken from the bag is

(2 marks)



5 (c) A ball is taken from the bag and then replaced.
What is the probability that the number on the ball is 50?

Answer (1 mark)

5 (d) All the balls with numbers that are factors of x are taken from the bag.
These are three yellow balls.

Write down **one** possible value of x .

.....
.....
.....

Answer (2 marks)

6 Solve the equations.

6 (a) $7x = 42$

Answer $x =$ (1 mark)

6 (b) $4y - 11 = 15$

.....

Answer $y =$ (2 marks)

6 (c) $6(w + 4) = 18$

.....
.....

Answer $w =$ (2 marks)



7 Two fair dice numbered 1 to 6 are rolled.
The numbers on the dice are multiplied to give the score.
The table shows the possible scores.

		Dice 1					
		1	2	3	4	5	6
Dice 2	1	1	2	3	4	5	6
	2	2	4	6	8	10	12
	3	3	6	9	12	15	18
	4	4	8	12	16	20	24
	5	5	10	15	20	25	30
	6	6	12	18	24	30	36

7 (a) (i) What is the probability of a score of 12?
Give your answer in its simplest form.

.....

Answer (2 marks)

7 (a) (ii) What is the probability of a score greater than 28?

.....

Answer (1 mark)

7 (b) Three fair dice numbered 1 to 6 are rolled.
The numbers on the dice are multiplied to give the score.

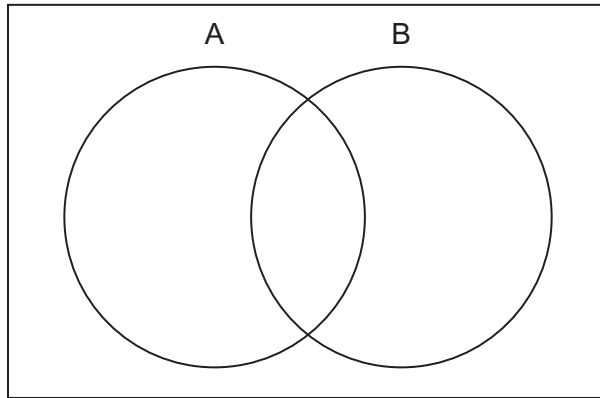
How many different odd numbers could be the score?
Show your working.

.....
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.....

Answer (2 marks)

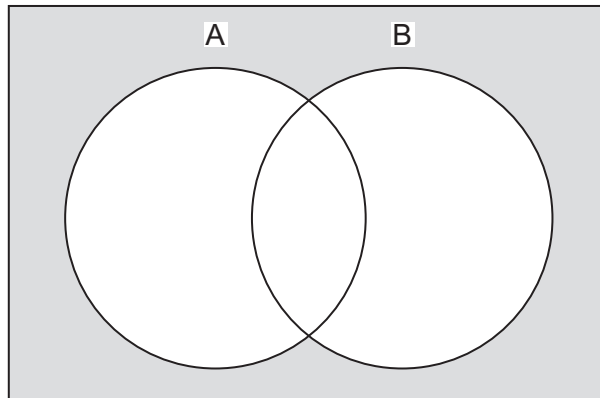


8 (a) Shade the Venn diagram to show the region $A' \cap B$



(1 mark)

8 (b) Use set notation to describe the shaded area in this Venn diagram.



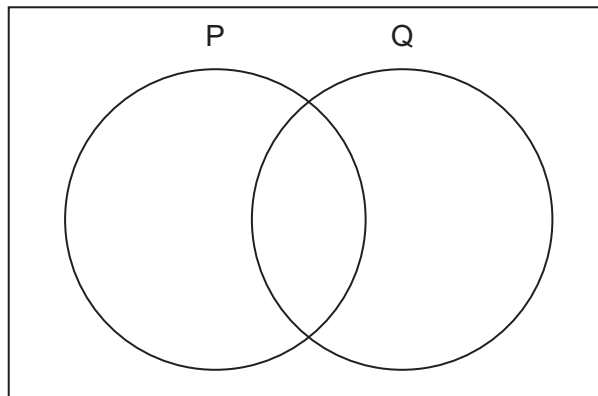
Answer (1 mark)

8 (c) The ten letters a, b, c, d, e, f, g, h, i and j are put into the Venn diagram below. One letter is picked at random.

The probability that it is in set P is $\frac{6}{10}$

The probability that it is in set Q is $\frac{7}{10}$

Show **one** correct way to put in the letters.



(2 marks)

Turn over ►



***9** Year 7 boys choose their favourite sport.

$\frac{1}{3}$ of the boys choose rugby.

$\frac{2}{5}$ of the boys choose football.

The rest of the boys choose hockey.
44 boys choose hockey.

How many boys choose football?

.....

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.....

.....

Answer (4 marks)

END OF SECTION A

4



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