Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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

General Certificate of Secondary Education
Foundation Tier
January 2011

Methods in Mathematics (Linked Pair Pilot) 93651F/B

Unit 1 Algebra and Probability Section B

F

Tuesday 11 January 2011 9.50 am to 10.35 am

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

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 you do not want to be marked.
- You must **not** use your calculator in Section B. Your calculator must remain on the floor under your seat.
- 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.

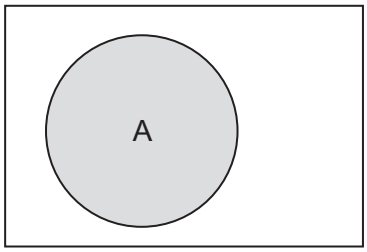
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 40.
- The quality of your written communication is specifically assessed in Questions 14 and 15.
  These questions are indicated with an asterisk (*)
- You may ask for more answer paper, graph paper and tracing paper.
  These must be tagged securely to this answer booklet.

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

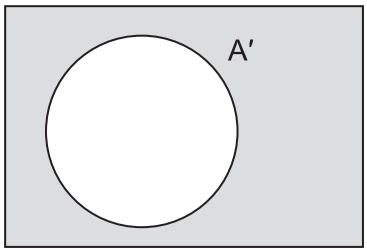
Formulae Sheet: Foundation Tier

Set notation

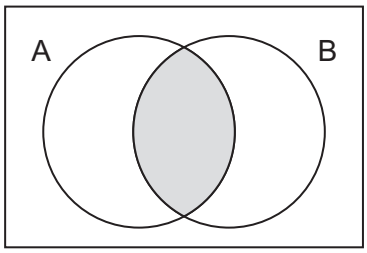
A



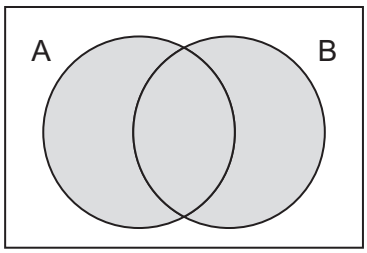
A′



$A \cap B$



$A \cup B$



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

13 (a) Work out 760 + 693

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Answer ..... *(1 mark)*

13 (b) Work out 800 – 517

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Answer ..... *(1 mark)*

13 (c) Work out 17 × 9

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Answer ..... *(1 mark)*

13 (d) Work out 84 ÷ 6

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Answer ..... *(1 mark)*

13 (e) If you add 1 to a number the answer is positive.
If you subtract 1 from the same number the answer is negative.

Give **one** possible number that this is true for.

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Answer ..... *(1 mark)*

5

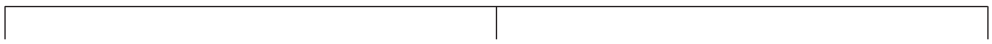
***14** John has five white shirts and four blue shirts.

14 (a) He picks a shirt at random.

Which colour shirt is he more likely to pick?

Answer ..... *(1 mark)*

14 (b) Mark on the scale the probability of John picking a blue shirt.



Impossible Evens Certain

(1 mark)

14 (c) At the end of the day John puts the shirt he picked into the washing basket.
The next morning he picks another shirt at random.
The probability that it is blue is 0.5

What colour shirt did John pick on the first day?
Show how you decide.

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Answer ..... *(2 marks)*

***15(a)** Write down an expression for the number three times bigger than n.

Answer ..... *(1 mark)*

15 (b) Write down the **two** expressions for the numbers that differ from n by 4.

Answer ..... and ..... *(2 marks)*

15 (c) The number five less than n is a negative number.

What is the biggest whole number that n could be?

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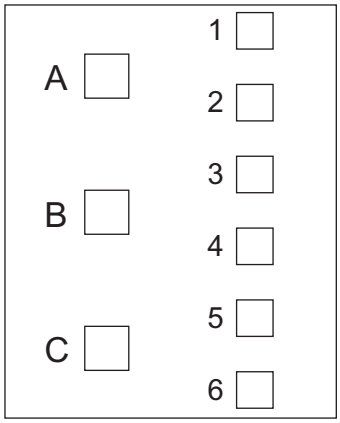
Answer ..... *(2 marks)*

16 (a) A drinks machine has the following buttons.



The code for each type of drink is one letter followed by one digit, for example, B2.

16 (a) (i) What is the maximum number of different types of drink the machine can hold?

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Answer ..... *(2 marks)*

16 (a) (ii) I know that the code for hot chocolate begins with A.
I do not know the digit.
I press A and then guess the digit.

What is the probability that I get hot chocolate?

Answer ..... *(1 mark)*

16 (b) Another machine must hold 30 different snacks.
Each type of snack must have a different code.
The code for each type of snack is one letter followed by one digit.

What is the smallest number of buttons the machine can have?

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Answer ..... *(2 marks)*

14

17 (a) Given that $x + 7 = 12$

work out the value of $2x$

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Answer ..... *(2 marks)*

17 (b) Given that $3y = 60$

work out the value of $y - 2$

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Answer ..... *(2 marks)*

18 a, b, c and d are positive whole numbers.

The sum of the numbers is 50
a is a multiple of 8
b is 2 more than a
c and d are both less than 10
d is greater than c

What are the four numbers?

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Answer a = ..., b = ..., c = ..., d = ... *(4 marks)*

19 There are 50 counters in a bag.
Some are square and some are round.
Some are red and some are blue.

The two-way table shows the numbers of each.

	Square	**Round**
Red	18	7
Blue	12	13

19 (a) A counter is taken at random from the bag.

19 (a) (i) What is the probability that it is a red counter?

Answer ..... *(1 mark)*

19 (a) (ii) What is the probability that it is a round blue counter?

Answer ..... *(1 mark)*

19 (b) The counter is put back in the bag.
Kemal picks a round counter from the bag.

What is the probability that it is blue?

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Answer ..... *(2 marks)*

20 5% of a number is equal to 20% of 120.

What is the number?

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Answer ..... *(2 marks)*

Turn over for the next question

14

21 Lena's phone number has six digits.
They are **all** different.
She remembers it as three 2-digit numbers.

The first 2-digit number is a factor of 106.
The second 2-digit number is a prime number less than twenty.
The third 2-digit number is a square number which is not a cube number.

What is her phone number?

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Answer ..... *(4 marks)*

22 Work out $1\frac{2}{3} + 2\frac{3}{4}$

Give your answer as a mixed number.

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Answer ..... *(3 marks)*

END OF QUESTIONS