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
June 2011

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

Unit 1 Algebra and Probability
Section B Non-calculator

F

Monday 13 June 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 that 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.

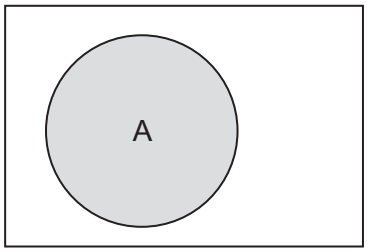
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 40.
- The quality of your written communication is specifically assessed in Question 17.
  This question is indicated with an asterisk (*)
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

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

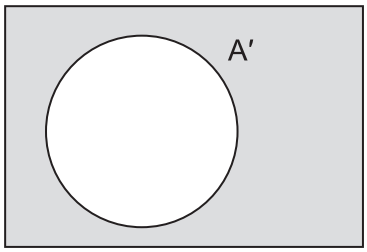
Formulae Sheet: Foundation Tier

Set notation

A



A′



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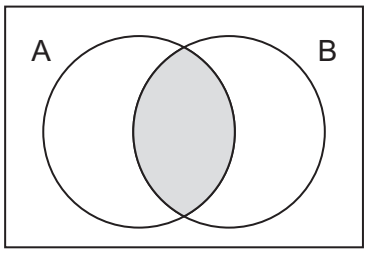

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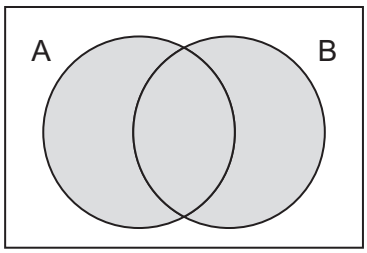

Answer **all** questions in the spaces provided.

10 Here is a list of six numbers.

18 180 1800 18 000 180 000 1 800 000

10 (a) From the list write down the correct number.

10 (a) (i) One hundred and eighty thousand.

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

10 (a) (ii) The number one hundred times bigger than 180.

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

10 (a) (iii) 1.8 million.

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

10 (b) Sadeeq subtracts the smallest number in the list from one of the others.

What digit does his answer end in?

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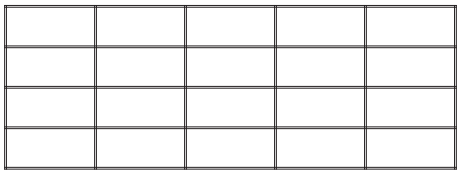
Answer ..... *(1 mark)*

11 A chocolate bar has 20 pieces.

Amber eats 25% of the bar.
Josh and Holly eat the rest of the bar.
Josh eats more pieces than Holly.



What is the greatest number of pieces that Holly could eat?

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.....

.....

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

7

12 John, Lily, Karl, Ruby and Leon are playing a game with cards.
There are ten cards, numbered 1 to 10.
Each player gets two cards.

John's cards add up to 4
Lily's cards add up to 8
Karl's cards add up to 11
Ruby's cards add up to 15
Leon's cards add up to 17

Work out which cards each player has.

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Answer John ..... and .....

Lily ..... and .....

Karl ..... and .....

Ruby ..... and .....

Leon ..... and ..... *(4 marks)*

13 Join each word to its example.

One has been done for you.

Word	**Example**
Equation	$x > 3$
Inequality	$7a + 5b$
Formula	$P = 4w$
Expression	$4x + 2 = 12$

(2 marks)

14 The digits of each of the first ten multiples of 9 add up to 9.

For example, 90 is the tenth multiple of 9 and 9 + 0 = 9

How many of the **next** ten multiples of 9 have digits which do **not** add up to 9?

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

15 Emma works out $40 - 10 \div 2$

Her answer is 15.

The correct answer is 35.

15 (a) Explain the mistake that Emma has made.

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(1 mark)

15 (b) Put $+$, $-$, $\times$, or $\div$ in each of the following to make them true.

15 (b) (i) 25 ..... 5 ..... 6 = –1

.....

.....

(1 mark)

15 (b) (ii) 25 ..... 5 ..... 6 = –5

.....

.....

(1 mark)

12

16 (a) Work out 0.7×0.2

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

16 (b) Work out $5^2 \times 2^3$

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

16 (c) Work out $\frac{4}{7} + \frac{3}{5}$

Give your answer as a mixed number.

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

17 (a) Factorise fully $6x^2 + 9x$

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

***17(b)** The expression $4(x + 6) - x$ can be simplified to the form $3(x + a)$

What is the value of a?

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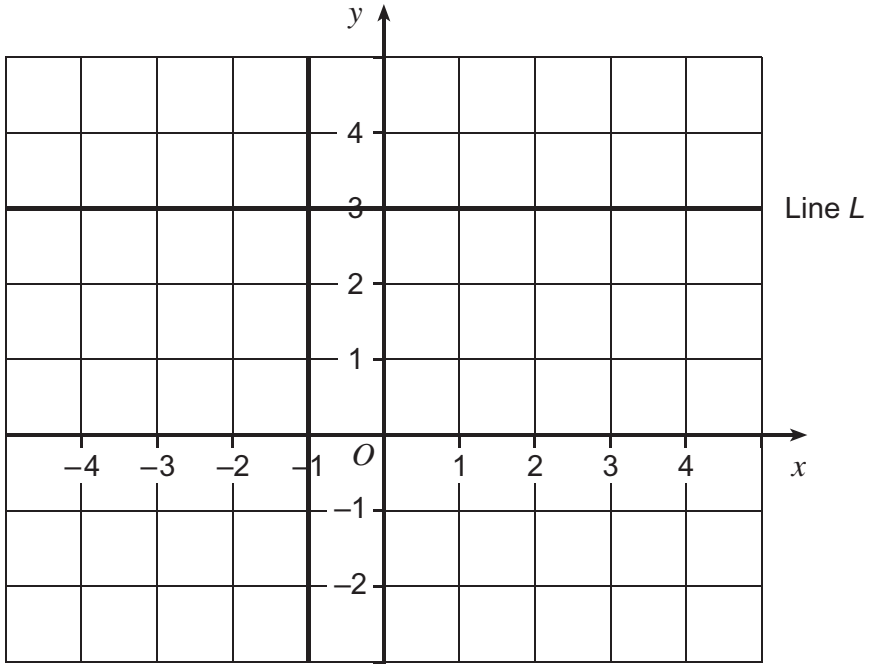
Answer ..... *(3 marks)*

18 The diagram shows two lines, *L* and *M*.



18 (a) (i) Write down the equation of line *L*.

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

18 (a) (ii) Write down the equation of line *M*.

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

18 (b) Another line, *K*, crosses *L* and *M*.
The x and y coordinates of the point where *K* crosses *L* are equal.
The x and y coordinates of the point where *K* crosses *M* are equal.

18 (b) (i) Draw the line *K* on the grid.

(2 marks)

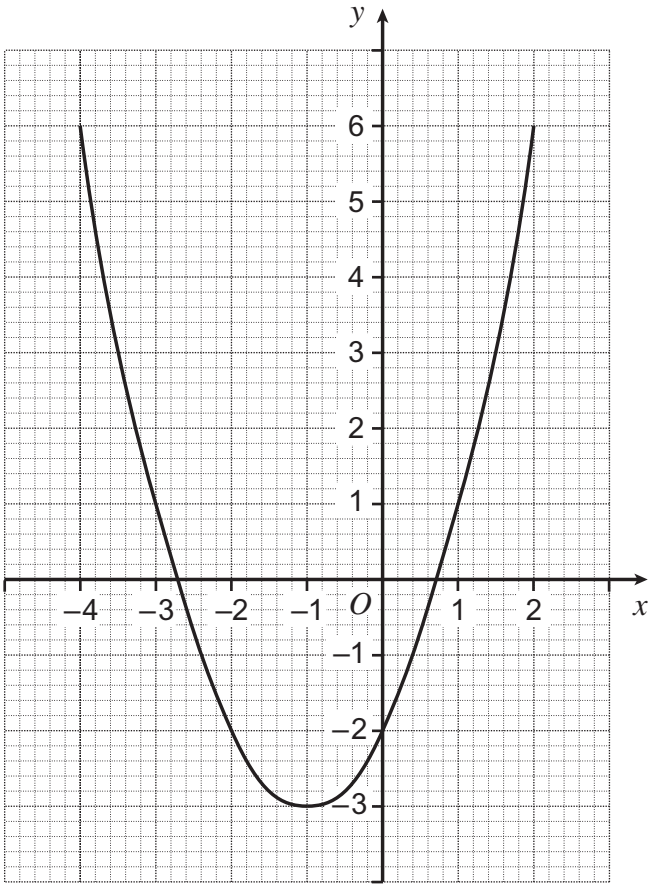
18 (b) (ii) Write down the equation of line *K*.

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

Turn over for the next question

16

19 The graph of $y = x^2 + 2x - 2$ is shown for values of x from -4 to 2.



Use the graph to find the approximate solutions to the equation $x^2 + 2x - 2 = 0$

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

20 (a) Write down an expression for the number that is one greater than n.

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

20 (b) Olivia and Ben start with the same whole number, n.
Olivia finds the sum of the next **two** whole numbers bigger than n.
Ben multiplies n by 5.
They both get the same answer.

Form an equation to show this information.
You are **not** required to solve the equation.

.....

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

END OF SECTION B

5