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	
10–11	
TOTAL	

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

Unit 1   Algebra and Probability
Section B   Non-Calculator

F

Monday 11 June 2012   2.20 pm to 3.05 pm

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 Question 16.
  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.

93651F/B

Formulae Sheet: Foundation Tier

Set notation

A

A′

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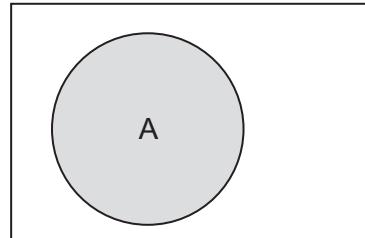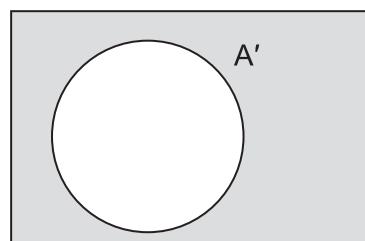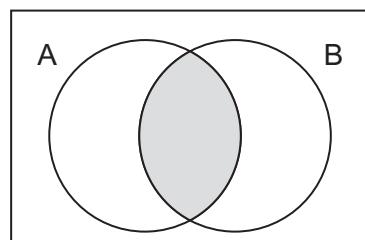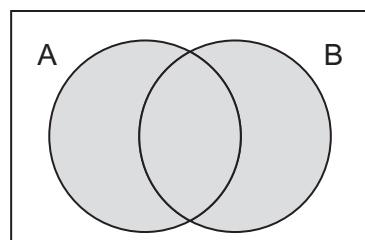
$A \cup B$

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

13   Here is a list of numbers.

21   24   33   63   67   74

13 (a)   Use numbers from the list to answer the following questions.

13 (a) (i)   Which two numbers add up to 100?

....

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

13 (a) (ii)   Which two numbers have a difference of 50?

....

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

13 (a) (iii)   Which number is 25% of 84?

....

Answer .... *(2 marks)*

13 (b)   Two more numbers are put in the list.
The sum of the numbers in the list is now 400.

What **two** numbers could they be?

....

....

....

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

7

Turn over ▶

14 Here is a grid showing points *A* and *B* joined by a line.
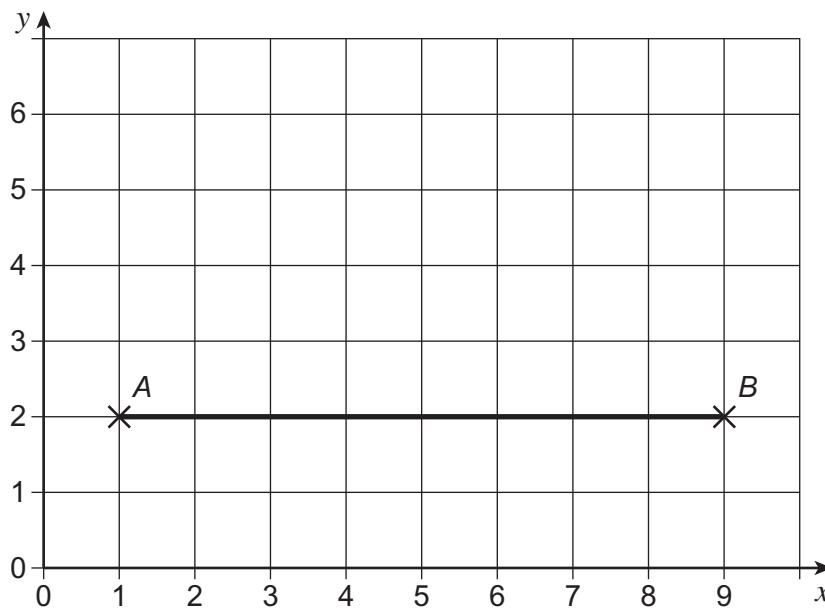
14 (a) Write down the coordinates of *A*.

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

14 (b) *C* is the point two squares directly above the midpoint of *AB*.

Mark the point *C* with a cross.

(2 marks)

15 Work out 274×31

....

....

....

....

....

....

Answer ....   *(3 marks)*

*16   50 men and 90 women work in a factory.

$\frac{2}{5}$ of the men in the factory wear glasses.

10% of the women in the factory wear glasses.

Khalid says, "In the factory, more than twice as many men as women wear glasses."

Is he correct?
You **must** show your working.

....

....

....

....

(4 marks)

17 (a)   Which of these is a whole number?

Circle the correct answer.

$\sqrt{8}$ $\sqrt{10}$ $\sqrt{50}$ $\sqrt{81}$ $\sqrt{125}$

(1 mark)

17 (b)   Show that $2^5 = 5^2 + 2 + 5$

....

....

....

(2 marks)

Turn over for the next question

18 In a game, the arrow on a spinner is spun twice.
The numbers the arrow lands on are added to give the score.

18 (a) This fair spinner is used to play the game.
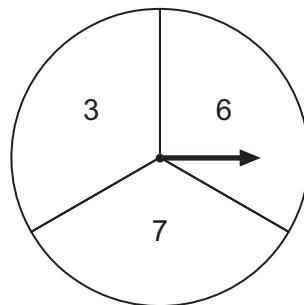
18 (a) (i) Complete the table of possible scores.

First spin

+	3	6	7
3	6		
6			
7			

Second spin

(1 mark)

18 (a) (ii) What is the probability that the score is an odd number?

....

Answer .... *(1 mark)*

18 (b) A different fair spinner is used to play the **same** game.
The spinner is spun twice.

Put numbers on the spinner so that

the lowest possible score is 2

the probability of a score of 4 is $\frac{1}{9}$

the highest possible score is a single-digit number.

....

....

....

(2 marks)

Turn over for the next question

4
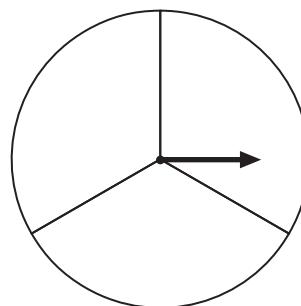
Turn over ▶

19 You are given that

$$1 \text{ pound} = \frac{5}{11} \text{ kg}$$

Use this to change 9 pounds into kilograms.
Give your answer as a mixed number.

....

....

....

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

20 A bottle of juice fills **either** 12 small glasses **or** 9 large glasses.
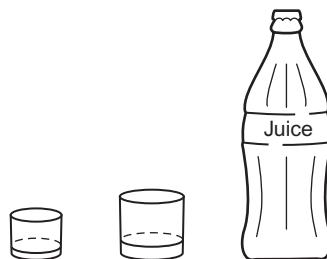
Four small glasses are filled from the bottle.

How many large glasses can be filled from the rest of the bottle?

....

....

....

....

Answer ....   *(2 marks)*

21 (a)   Solve $7w = 35$

....

$w =$ ....   *(1 mark)*

21 (b)   Solve $4y - 11 = 17$

....

....

$y =$ ....   *(2 marks)*

21 (c) $x = 5$ is the solution to the equation $a(x - 3) = 4x - b$

a and b are integers.

Work out **two** possible pairs of values for a and b.

....

....

....

....

....

$a =$ .... $b =$ ....

$a =$ .... $b =$ ....   *(3 marks)*

Turn over for the next question

11

Turn over ▶

22 A six-sided dice is numbered 1 to 6.
Gary, Lynn and Michael want to know if the dice is fair.

22 (a) Gary rolls the dice 200 times.
Here are his results.
The relative frequency for **1** is missing.

Number rolled	1	2	3	4	5	6
Relative frequency		0.15	0.1	0.1	0.3	0.15

How many times did Gary roll the number **1**?

....

....

....

Answer .... *(3 marks)*

22 (b) Lynn says

> If I roll the dice 200 times I am certain to get the same results as Gary.

Is she correct?
Tick the correct box.

Yes ☐   No ☐

Give a reason for your answer.

....

....

(1 mark)

22 (c)   Michael also rolls the dice 200 times.

He says to Gary

> To see if the dice is fair it will be better if we put our results together.

Is he correct?
Tick the correct box.

Yes ☐   No ☐

Give a reason for your answer.

....

....

(1 mark)

END OF SECTION B

There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**