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General Certificate of Secondary Education  
Foundation Tier

# Methods in Mathematics (Linked Pair Pilot)

93651F/A

Unit 1 Foundation Tier (Section A)

Specimen Paper

**F**

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

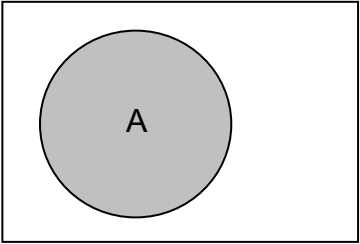
- In all calculations, show clearly how you work out your answer.

**93651F/A**

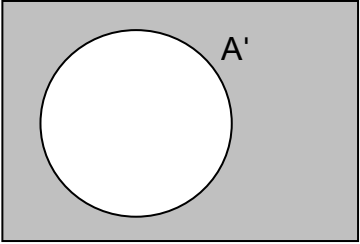
Formulae Sheet: Foundation Tier

Set notation

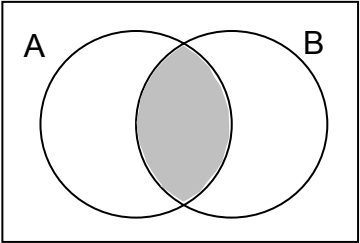
A



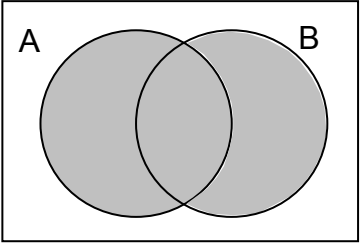
A'



$A \cap B$



$A \cup B$



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

- 1** Part of a shopping bill is shown.

0.6 kg of bananas at 75p per kg	£ 0.45
..... kg of apples at 90p per kg	
Total	£ 1.89

How many kilograms of apples are bought?

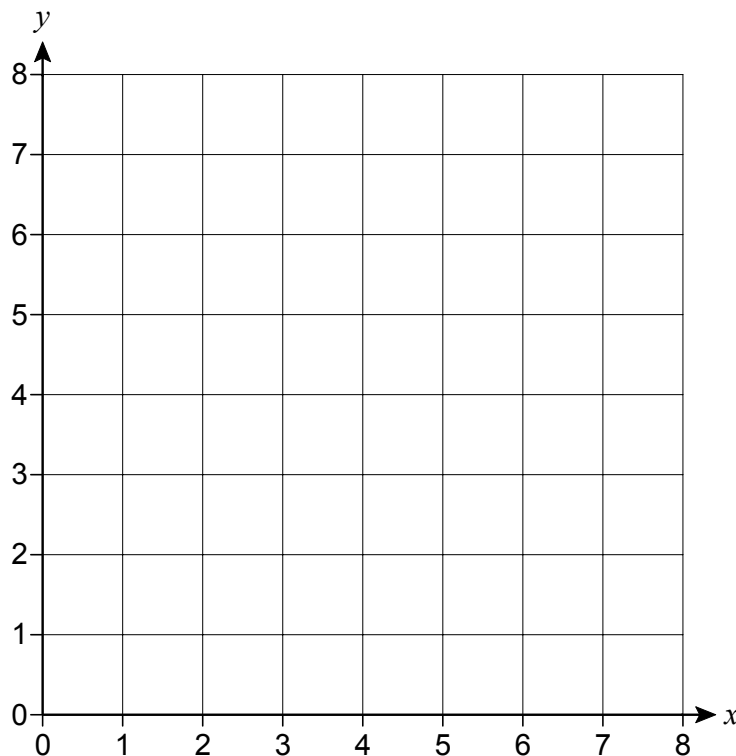
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Answer ..... kg (3 marks)

- 2 (a)** Plot the point  $A(2, 5)$  on the grid.



(1 mark)

- 2 (b)** B is the point  $(8, 5)$ .  
Work out the coordinates of the mid-point of  $AB$ .

.....

Answer (....., ..... ) (2 marks)

- 3 In the magic square, the rows, columns and diagonals add up to the same number.

24	5	.....
7	15	.....
.....	.....	6

Complete the magic square.

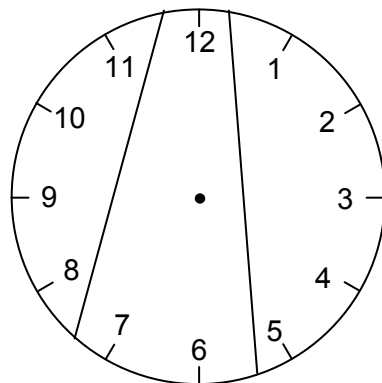
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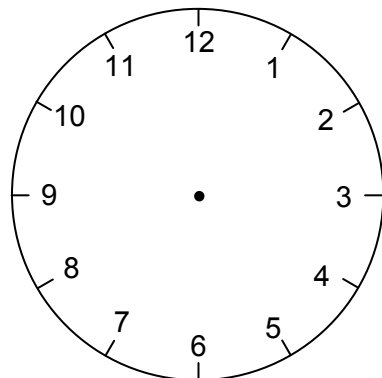
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(3 marks)

- 4 This clock face has been divided into three parts with two lines.  
The totals of the numbers in each part are 38, 25 and 15.



Divide the clock below into three parts with two lines so that the totals of the numbers in the three parts are equal.



.....

.....

(2 marks)

5 Which of the following are equivalent to  $\frac{1}{5}$ ?

Circle the equivalent values.

0.2

5%

20%

$\frac{3}{7}$

$\frac{4}{20}$

(2 marks)

6 Simplify  $3a + 4b + 5a - 2b$

.....

.....

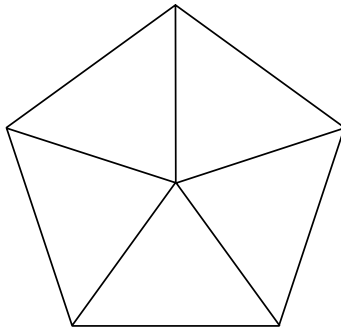
Answer ..... (2 marks)

**Turn over for the next question**

**7** Each diagram shows a fair five sided spinner.

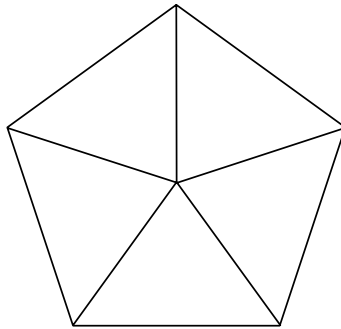
Write a number in each section to make the statement true.

**7 (a)** Statement: It is certain that you will get the number 2.



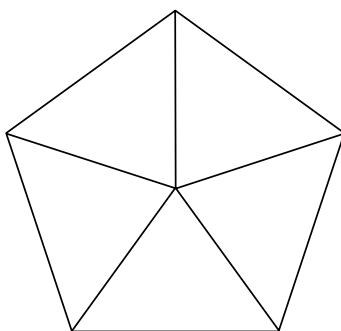
*(1 mark)*

**7 (b)** Statement: It is impossible that you will get an even number.



*(1 mark)*

**7 (c)** Statement: The probability of getting 3 is  $\frac{2}{5}$ .



*(1 mark)*

- 8** When  $x$  is divided by 2 there is a remainder of 1.  
When  $x$  is divided by 3 there is a remainder of 2.  
When  $x$  is divided by 4 there is a remainder of 3.

Work out **two** possible values of  $x$ .

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

Answer ..... (2 marks)

- 9 (a)** Use your calculator to work out  $\sqrt{7.2}$   
Write down all the figures in your calculator display.

Answer ..... (1 mark)

- 9 (b)** Use your calculator to work out  $7.2^3$

.....

Answer ..... (1 mark)

**Turn over for the next question**

**10 (a)** A bag contains 50 balls which are all the same size.  
The balls are numbered 1 to 50  
A ball is chosen at random.

**10 (a) (i)** What is the probability that the ball is numbered 47?

Answer ..... (1 mark)

**10 (a) (ii)** What is the probability that the ball has a number greater than 40 on it?  
Give your answer in its simplest form.

.....  
.....

Answer ..... (2 marks)

**10 (b)** Another bag contains blue, green and red balls.  
A ball is chosen at random.

The probability that it is blue is exactly  $\frac{2}{3}$ .

**10(b) (i)** What is the probability that the ball is **not** blue?

.....  
.....

Answer ..... (1 mark)

**10(b) (ii)** Could there be 14 balls in the bag in total?

Tick a box.

Yes  No

Give a reason for your choice.

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

(1 mark)



- 11** The ratio of boys to girls in a class is 2 : 3  
Which of the following statements is True (T), False (F) or could be true (C).  
Put a tick in the appropriate box.  
The first one is done for you.

Statement	T	F	C
There are 13 boys on the class		✓	
There are 30 students in the class			
The fraction of boys in the class is $\frac{2}{3}$			
The percentage of girls in the class is 60%			
The number of girls in the class must be a multiple of 3			

(3 marks)

- 12** The sum of the two digits of the number 18 is 9 because  $1 + 8 = 9$   
How many whole numbers from 10 to 99 inclusive have the sum of their digits equal to 9?

.....

.....

.....

.....

.....

.....

Answer ..... (3 marks)

- 13** Solve the equation  $7x - 9 = 3x + 5$

.....

.....

.....

.....

.....

Answer  $x =$  ..... (3 marks)

- 14** Ann has two brothers.  
David is 3 years younger than Ann.  
Ken is twice as old as Ann.  
The total of all three ages is 25.

Work out Ann's age.

.....

.....

.....

.....

.....

Answer ..... (4 marks)

**END OF SECTION A**

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General Certificate of Secondary Education  
Foundation Tier

# Methods in Mathematics (Linked Pair Pilot)

**93651F/B**

Unit 1 Foundation Tier (Section B)

Specimen Paper

**F**

<p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>mathematical instruments.</li> </ul> <p>You may <b>not</b> use a calculator.</p>	
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**Time allowed**  
45 minutes

### Instructions

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- 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 18 and 26.  
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

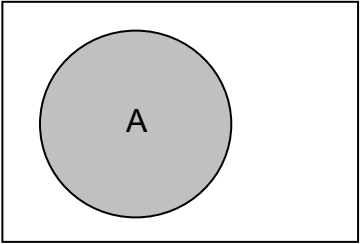
- In all calculations, show clearly how you work out your answer.

**93651F/B**

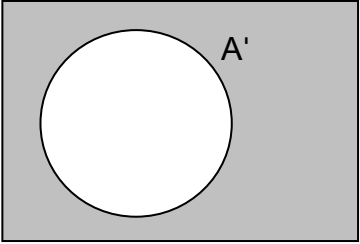
Formulae Sheet: Foundation Tier

Set notation

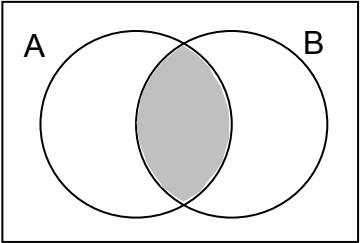
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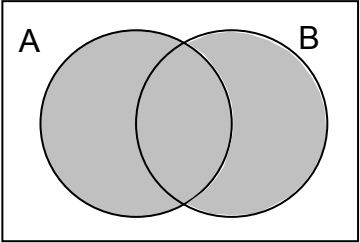
A'



$A \cap B$



$A \cup B$



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

**15(a)(i)** Work out  $52 + 123$

.....  
.....

Answer ..... (1 mark)

**15(a)(ii)** Work out  $400 - 182$

.....  
.....

Answer ..... (1 mark)

**15(a)(iii)** Work out  $3 \times 62$

.....  
.....

Answer ..... (1 mark)

**15(a)(iv)** Work out  $195 \div 5$

.....  
.....

Answer ..... (1 mark)

**15(b)** Complete the boxes below.

**15(b)(i)**  $7200 \times 10 =$

(1 mark)

**15(b)(ii)**  $7200 \div 10 =$

(1 mark)

**16** Estimate the answer to  $103 \times 7.9$

.....  
 .....

Answer ..... (2 marks)

**17** Complete the table below.

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	
	0.7	70%
$\frac{3}{100}$		3%

(3 marks)

\* **18** Katie cycles 100 miles in 5 days.  
 Each day she cycles 6 fewer miles than the day before.

How many miles does she cycle on the first day?

Show clearly how you work out your answer.

.....  
 .....

Answer ..... (3 marks)



**19(a)** You are given that  $6y = 48$

Work out the value of  $5y$ .

.....

.....

Answer ..... (2 marks)


**19(b)** Find the value of  $3x + 5y$  when  $x = 7$  and  $y = -4$

.....

.....

Answer ..... (2 marks)

**20** An ice cream van sells 5 different flavours of ice cream.  
A group of children line up to buy ice cream.  
Each child has a double scoop with **two** flavours.  
Each child chooses a different combination of flavours.  
Every possible combination is chosen.

<b>Ice Cream</b>	
<i>Choose from</i>	
Vanilla	
Strawberry	
Chocolate	
Lemon	
Mint	
<b>Double scoop only 99 p</b>	

How many children are there?

.....

.....

.....

.....

.....

Answer ..... (2 marks)

**21 (a)** Complete the number pattern below

$$12^2 - 11^2 = 12 + 11 = 23$$

$$11^2 - 10^2 = 11 + 10 = 21$$

$$10^2 - 9^2 = 10 + 9 =$$

$$\underline{\quad} - \underline{\quad} = \underline{\quad} + \underline{\quad} = 17$$

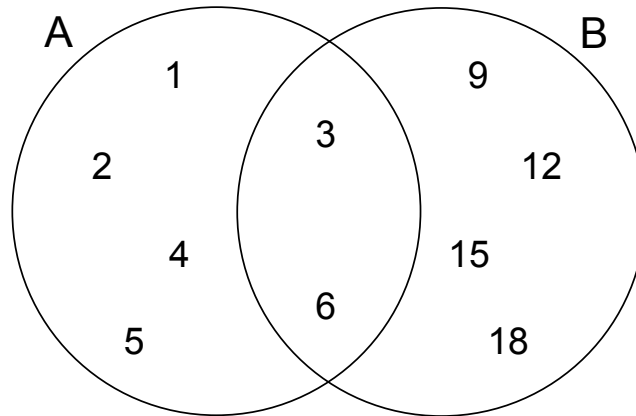
(2 marks)

**21 (b)** Use the pattern in part (a) to complete the algebraic expression below.

$$(n + 1)^2 - \underline{\quad} = \underline{\quad} + \underline{\quad} = 2n + 1$$

(2 marks)

**22** The Venn diagram shows two sets A and B.



**22(a)** A number is selected at random from set A.

**22(a)(i)** What is the probability that it is an odd number?

Answer ..... (1 mark)

**22(a)(ii)** What is the probability that it is a factor of 12?

Answer ..... (1 mark)

**22(b)** A number is selected at random from  $A \cup B$ .

What is the probability that it is a multiple of 3?

.....

Answer ..... (2 marks)

**23** In the following calculations each letter represents a different digit.

$$A \times A = BC$$

$$BC \times BC = DEC$$

Which digit does each letter represent?

.....

.....

.....

.....

.....

.....

$$A = \text{.....}$$

$$B = \text{.....}$$

$$C = \text{.....}$$

$$D = \text{.....}$$

$$E = \text{.....}$$

(3 marks)

**24(a)** Factorise  $x^2 - 3x$

.....

Answer ..... (1 mark)

**24(b)** Expand and simplify  $3(x^2 + 2x) - 2x(x - 3)$

.....

.....

.....

Answer ..... (2 marks)

25 Work out  $3\frac{3}{4} - 1\frac{2}{3}$

.....

.....

.....

.....

.....

.....

Answer ..... (3 marks)

\* 26 A, B and C are three expressions.

$$A = 3x - 4$$

$$B = 10 - 7x$$

$$C = 3 - 2x$$

Show clearly that  $A + B = 2C$

.....

.....

.....

.....

(3 marks)

**END OF QUESTIONS**

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