

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	



General Certificate of Secondary Education
Higher Tier
January 2013

Methods in Mathematics (Linked Pair Pilot)

93651H/B

Unit 1 Algebra and Probability
Section B Non-calculator

H

Friday 11 January 2013 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 spaces 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 13 and 16. 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.



J A N 1 3 9 3 6 5 1 H B 0 1

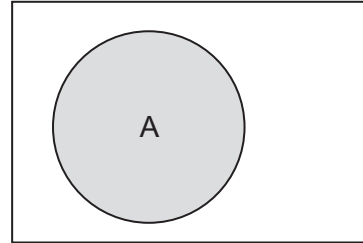
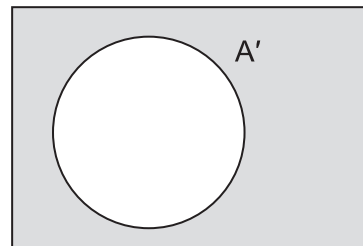
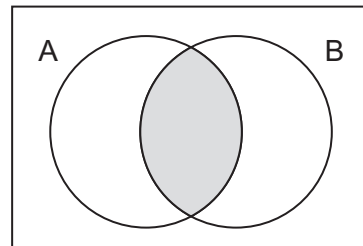
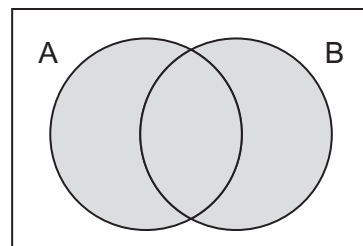
WMP/Jan13/93651H/B

93651H/B

Formulae Sheet: Higher Tier

Set notation

A

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

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

12 Increase 6800 by 12%.

.....

.....

.....

.....

.....

.....

.....

.....

.....

Answer (3 marks)

***13** Which is bigger, 7×0.12 or $\frac{17}{20}$?

You **must** show your working.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

7

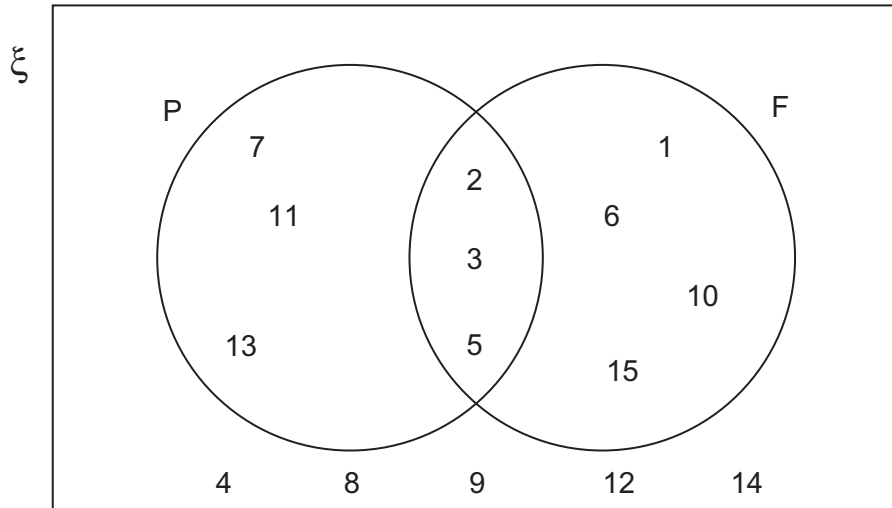
Turn over ►



14 The Universal Set in the Venn diagram is the numbers 1 to 15.

Set P represents prime numbers.

Set F represents factors of 30.



14 (a) A number from 1 to 15 is chosen at random.

What is the probability that it is a prime number?

.....

Answer (1 mark)

14 (b) A number from 1 to 15 is chosen at random.

What is the probability that it is **not** a prime number and **not** a factor of 30?

.....

Answer (1 mark)



14 (c) A number from $P \cup F$ is chosen at random.

What is the probability that it is a factor of 30?

.....

Answer (2 marks)

15 $6 \leq 2n < 14$

List the possible integer values of n .

.....

.....

.....

.....

Answer (3 marks)

Turn over for the next question



16 In a quiz, players can choose to answer **easy** or **hard** questions.

x points are scored for an easy question.
10 **more** points are scored for a hard question.

***16 (a)** Write the points scored for a **hard** question in terms of x .

Answer (1 mark)

16 (b) A player correctly answers 3 easy questions and 2 hard questions.
She scores 95 points.

Use this information to write an equation in x .

.....

Answer (1 mark)

16 (c) Solve your equation to find the number of points scored for an **easy** question.

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

Answer (3 marks)



17 The point $(1, -1)$ lies on the graph of $y = x^2 + c$ where c is a number.

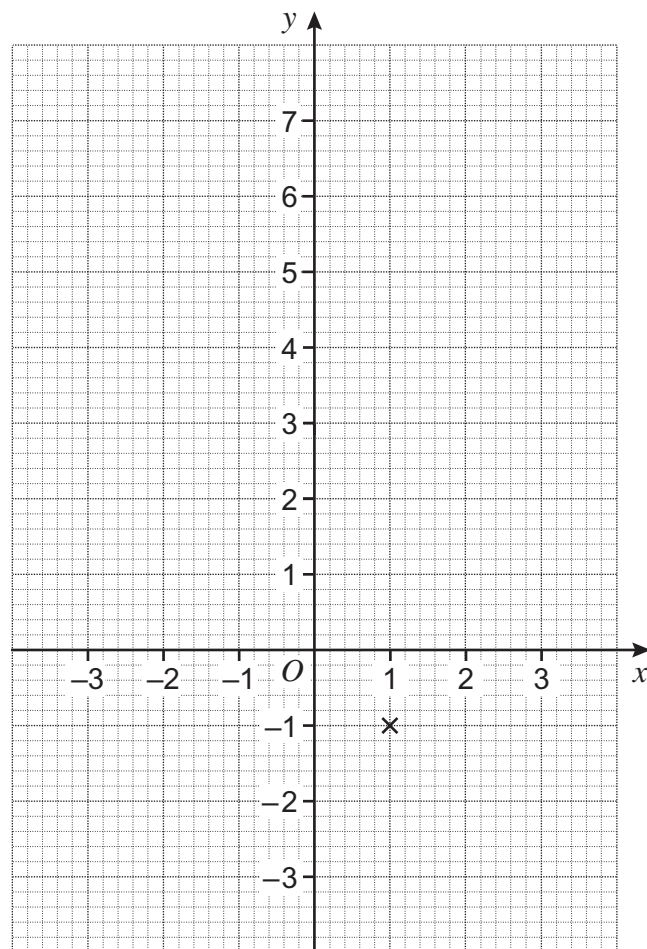
On the grid, draw this graph for values of x from -3 to 3 .

.....

.....

.....

.....



(4 marks)



18 Factorise $x^2 + 9x + 14$

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

Answer (2 marks)

19 Rearrange $4(2x + y) = 11 + 7y$ to make x the subject.

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

Answer (3 marks)



20 Simplify $(2x^5y)^3$

.....

Answer (2 marks)

21 x is a number between 0 and 1.

Write the following in numerical order, starting with the smallest.

\sqrt{x} x^2 x^0 $\frac{1}{x}$ x

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

Answer (2 marks)

Turn over for the next question



22 (a) Work out the value of $\sqrt{2} \times \sqrt{32}$

.....

.....

.....

.....

Answer (2 marks)

22 (b) Rationalise the denominator and simplify $\frac{21}{\sqrt{7}}$

.....

.....

Answer (2 marks)



23

A bag contains 7 red balls and 4 blue balls.
Two balls are chosen at random without replacement.

What is the probability that the two balls are the same colour?

.....

.....

.....

.....

.....

Answer (4 marks)

END OF SECTION B

8



There are no questions printed on this page

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

