

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
June 2013

Methods in Mathematics (Linked Pair Pilot)

93651H/B

Unit 1 Algebra and Probability
Section B Non-calculator

H

Thursday 20 June 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 book.

Advice

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



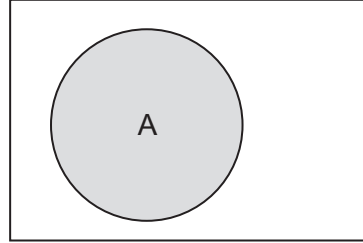
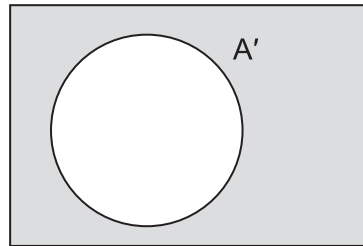
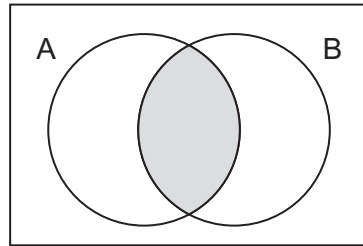
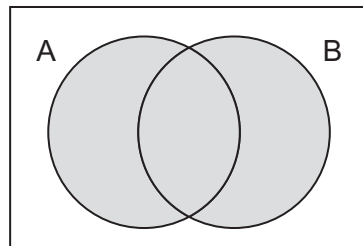
J U N 1 3 9 3 6 5 1 H B 0 1

WMP/Jun13/93651H/B

93651H/B

Formulae Sheet: Higher Tier

Set notation

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

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

11 (a) What is 70 out of 200 as a percentage?

Answer % (1 mark)

11 (b) Work out 0.5 % of 920

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.....

Answer (2 marks)

12 Given $5y + 4 = ay$
Work out the value of a when $y = 2$

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.....

$a =$ (2 marks)

5

Turn over ►



- *13** The two sets of instructions give identical outcomes.
Complete the tables to show this.

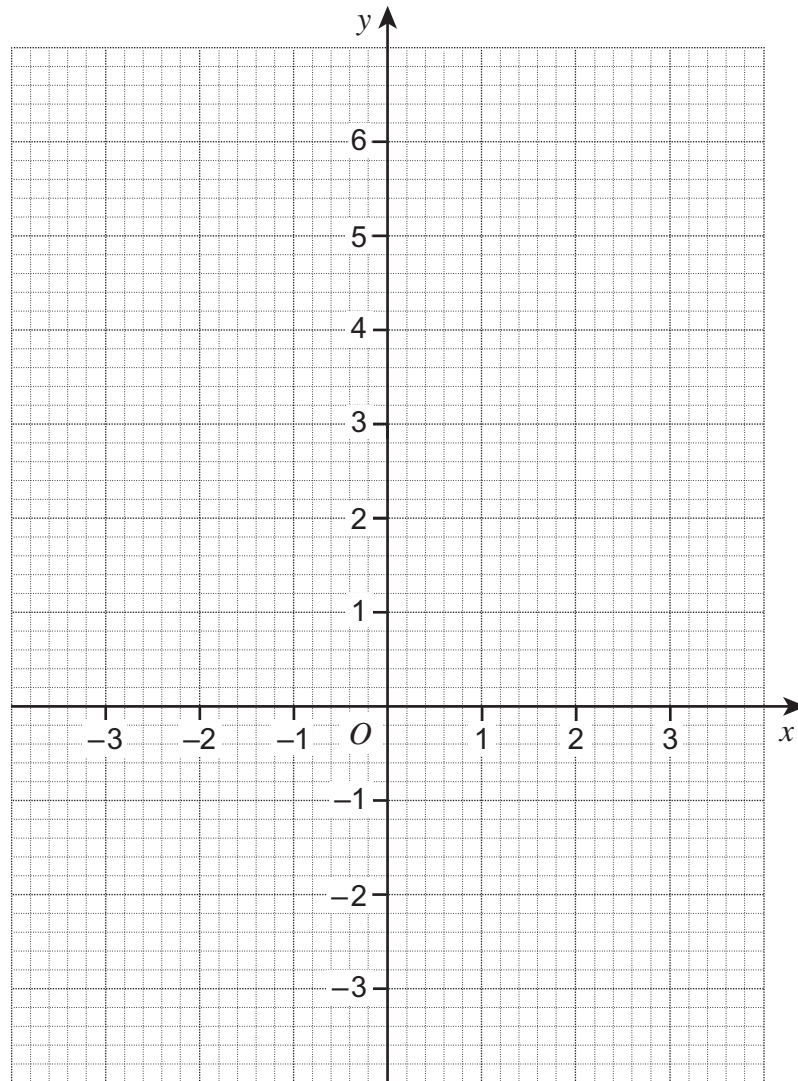
First set	
Instruction	Expression
Start with x	x
Double it	$2x$
Double again	
Add 6	
Outcome	

Second set	
Instruction	Expression
Start with x	x
Add 4	
Multiply by 4	
Subtract 10	
Outcome	

(3 marks)



14 Draw the graph of $x + y = 2$ for values of x from -3 to 3 .



(3 marks)



15 The four possible outcomes of a trial are A, B, C and D.

	A	B	C	D
Probability	0.3	0.25	0.1	

15 (a) What is the probability that the outcome of the trial is D?

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Answer (2 marks)

15 (b) What is the probability that the outcome of the trial is A or C?

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Answer (1 mark)



*16 Write $\frac{8}{11}$ as a recurring decimal.

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Answer (2 marks)

17 Expand and simplify $(2x + 1)(3x + 4)$

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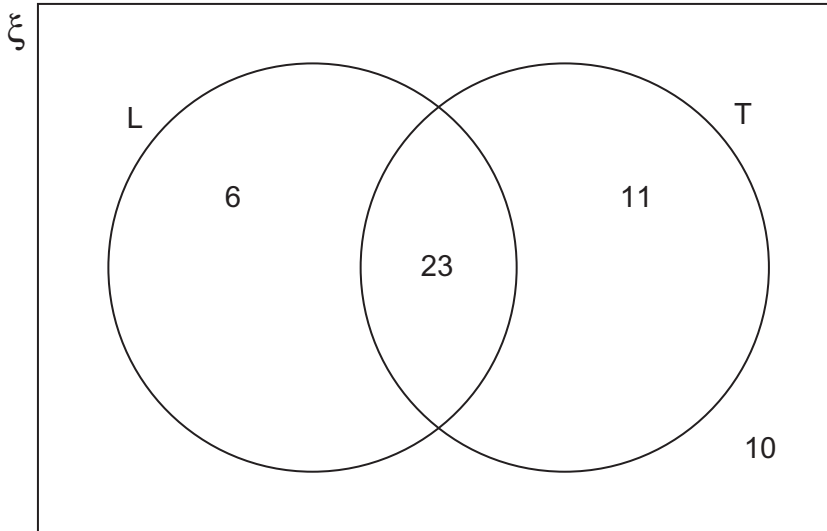
Answer (3 marks)

Turn over for the next question



- 18** Here is a Venn diagram.
It shows information about the number of students who have a laptop or a TV.

Set L represents students with a laptop.
Set T represents students with a TV.



There are 50 students altogether.

A student is chosen at random.

- 18 (a)** Work out $P(L)$.

Answer (1 mark)

- 18 (b)** Work out $P(L \cap T)$.

Answer (1 mark)



18 (c) Complete the following using set notation.

$$P(\dots\dots\dots) = \frac{21}{50}$$

(1 mark)

18 (d) Complete the following using set notation.

$$P(\dots\dots\dots) = \frac{4}{5}$$

(2 marks)

19 (a) Solve $-17 \leq 4x + 3 < 11$

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Answer (2 marks)

19 (b) Work out the product of all the **integer** solutions to $-17 \leq 4x + 3 < 11$
You **must** show your working.

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.....

Answer (2 marks)



- 20** When a number is multiplied by $2\frac{1}{4}$ the answer is 3.
Work out the number.

Answer (4 marks)

- 21** Ten socks are in a drawer.
Four of the socks are black.
Two socks are chosen at random.
What is the probability of choosing two black socks?

Answer (3 marks)



22 (a) Write $(5 + \sqrt{7})^2$ in the form $a + b\sqrt{7}$

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Answer (2 marks)

22 (b) $p = \sqrt{3}$ and $q = \sqrt{6}$

Show that $(pq)^{-1} = \frac{\sqrt{2}}{6}$

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(3 marks)

END OF QUESTIONS



There are no questions printed on this page

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

