

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

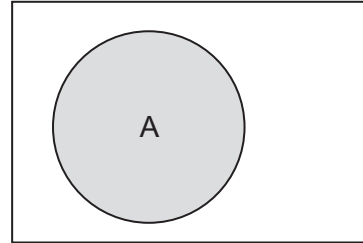
WMP/Jun13/93651H/B

93651H/B

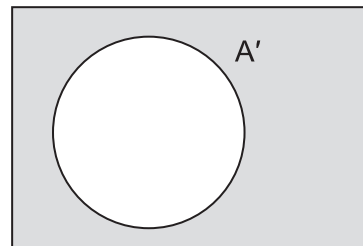
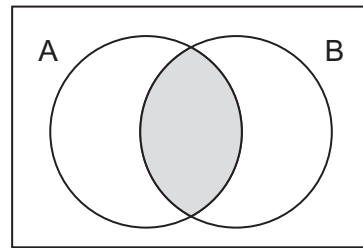
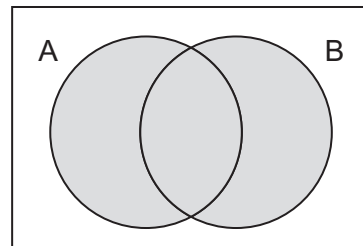
Formulae Sheet: Higher Tier

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

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

Answer (2 marks)

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

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

$a =$ (2 marks)

5

Turn over ►



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

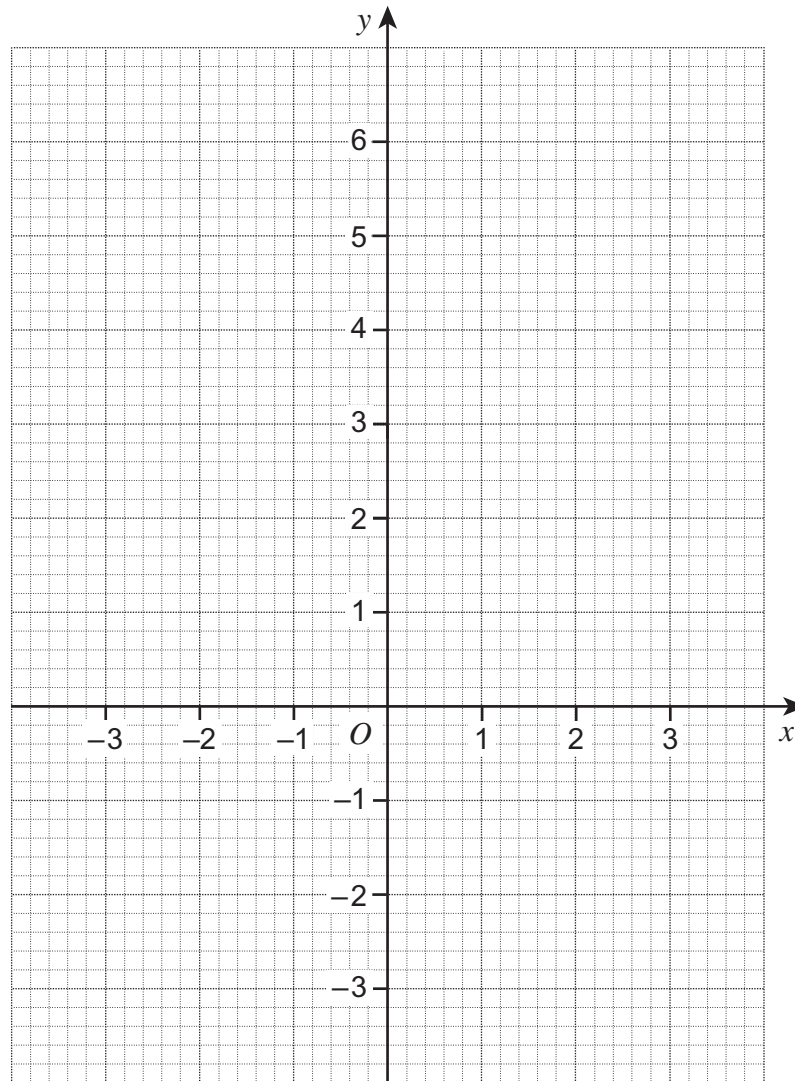
First set	
Instruction	Expression
Start with x	x
Double it	$2x$
Double again	
Add 6	
Outcome	

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?

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

Answer (2 marks)

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

.....

Answer (1 mark)



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

.....

.....

.....

.....

Answer (2 marks)

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

.....

.....

.....

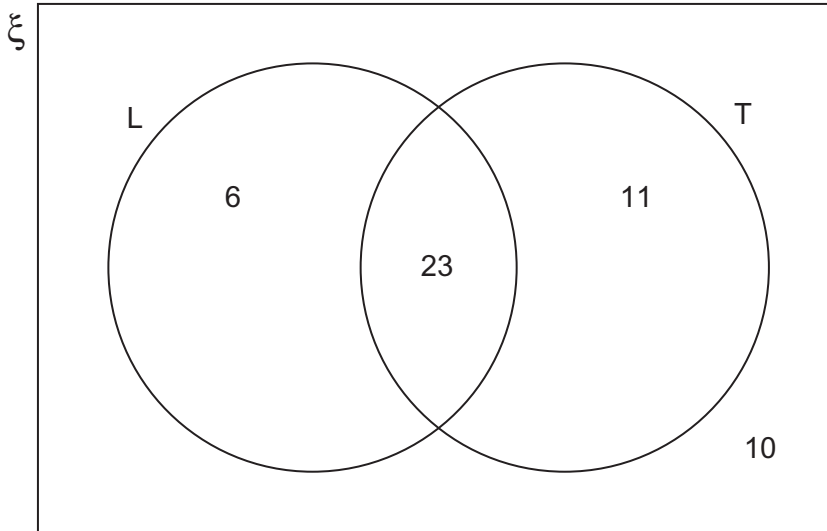
Answer (3 marks)

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 $-17 \leq 4x + 3 < 11$

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

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.

.....
.....

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 $a + b\sqrt{7}$

.....

.....

.....

.....

.....

Answer (2 marks)

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

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

.....

.....

.....

.....

.....

.....

.....

.....

(3 marks)

END OF QUESTIONS



There are no questions printed on this page

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

