

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

GCSE METHODS IN MATHEMATICS (LINKED PAIR)

H

Higher Tier Unit 1 Algebra and Probability (Section A)

Thursday 26 May 2016

Morning

Time allowed: 45 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments.

**Instructions**

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- 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.
- 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 must **not** use a 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 1, 2 and 9. 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.
- You are expected to use a calculator where appropriate.

Advice

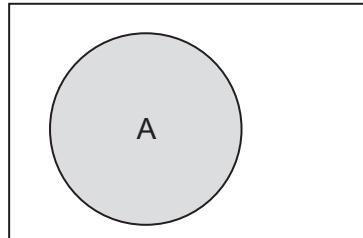
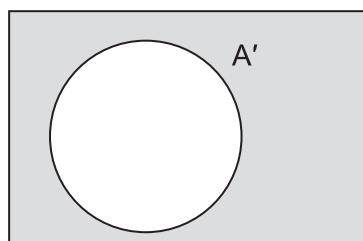
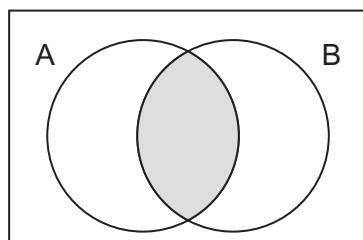
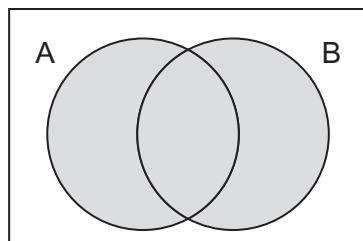
- In all calculations, show clearly how you work out your answer.



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

WMP/Jun16/E4

93651H/A

Formulae Sheet: Higher Tier**Set notation** A  A'  $A \cap B$  $A \cup B$ 

0 2

WMP/Jun16/93651H/A

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

- *1 There are 140 counters in box A.
There are 220 counters in box B.

The number of counters in A is **increased** by 20%

The number of counters in B is **decreased** by $\frac{1}{4}$

Which box now has more counters?

You **must** show your working.

[4 marks]

Answer _____

4

Turn over ►



0 3

WMP/Jun16/93651H/A

2 (a) Circle the cube number.

[1 mark]

24

33

64

81

2 (b) Work out $\sqrt[3]{9261}$

[1 mark]

Answer _____

***2 (c)** 10 648 is the first cube number with five digits.

Show that there are 25 cube numbers with five digits.

[3 marks]



0 4

WMP/Jun16/93651H/A

3 Solve $3(5x + 12) = 4x - 8$

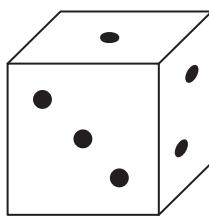
[3 marks]

$$x = \underline{\hspace{2cm}}$$

Turn over for the next question



- 4 Here is a six-sided dice numbered 1 to 6



Describe how the dice can be tested to see if the dice is fair.

[2 marks]



5List the **integer** values of x that satisfy the inequality

$$-1 < 2x - 1 \leq 8$$

[3 marks]

Answer _____

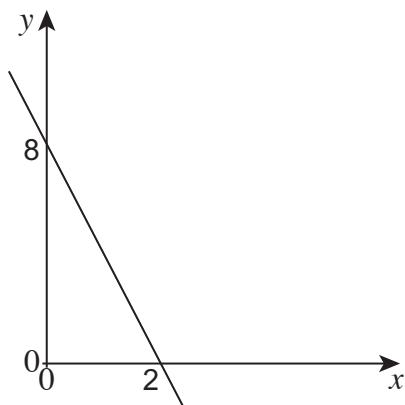
Turn over for the next question

5

Turn over ►

0 7

- 6 (a) Here is a sketch of a straight line.



Work out the gradient of the line.
Circle your answer.

[1 mark]

-4

-0.25

0.25

4



0 8

- 6 (b)** A different line passes through the points $(2, 1)$ and $(6, 9)$
The line also passes through the point $(20, a)$

Work out the value of a .

[3 marks]

Answer _____

4

Turn over ►



0 9

7

Joe, Saj and Abi each do some trials of the same experiment.
The table shows information about the results of the trials.

	Number of trials	Relative frequency of success
Joe	200	0.680
Saj	400	0.740
Abi	600	0.755

Work out the relative frequency of success for all 1200 trials.
Give your answer as a decimal.

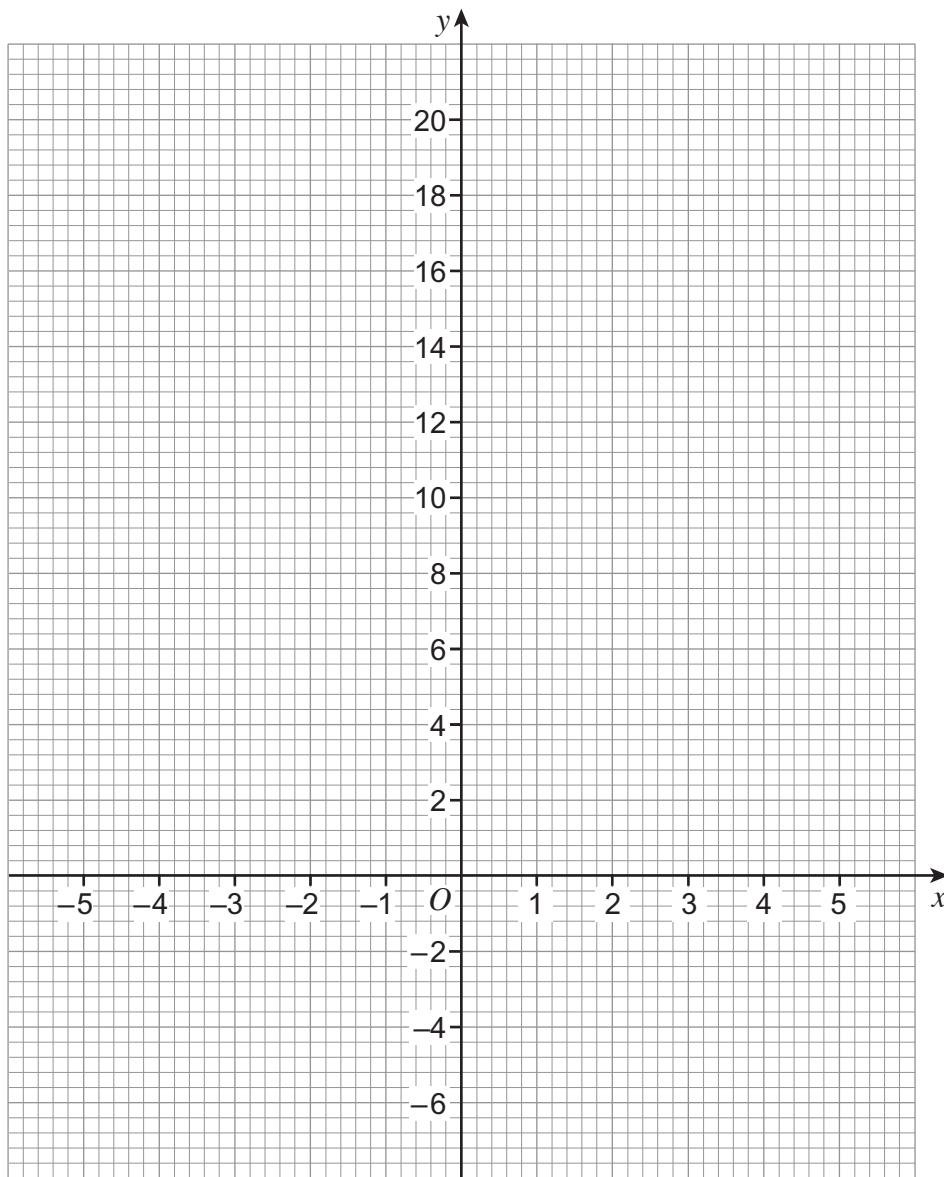
[3 marks]

Answer _____



- 8 By drawing the graphs of $y = x^2 - 5$ and $y = 4 - x$ for $-5 \leq x \leq 5$ find the solutions of the equation $x^2 - 5 = 4 - x$

[5 marks]



Answer _____

8

Turn over ►



1 1

*9 Any odd number can be expressed in the form $2n + 1$ where n is an integer.

Prove that the sum of any four consecutive odd numbers is a multiple of 8

[4 marks]



10

Here are seven coins.



Two coins are chosen at random.

Work out the probability that the **total** value of the two coins is **at least £1****[4 marks]**

Answer _____

Turn over for the next question**8****Turn over ►**

1 3

11

Express as a single, simplified, algebraic fraction

$$\frac{10x + 3}{5} + \frac{1}{x - 4} - 2x$$

[3 marks]

Answer _____

END OF SECTION A**3**

1 4

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ANSWER IN THE SPACES PROVIDED**



1 5

There are no questions printed on this page

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