

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	
12 – 13	
14	
TOTAL	



General Certificate of Secondary Education
Higher Tier
June 2014

Methods in Mathematics (Linked Pair Pilot)

93651H/B

H

Unit 1 Algebra and Probability
Section B Non-Calculator

Thursday 19 June 2014 9.50 am to 10.35 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> mathematical instruments. <p>You must not use a calculator.</p>	
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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 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 that 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 Section A only.
- 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.

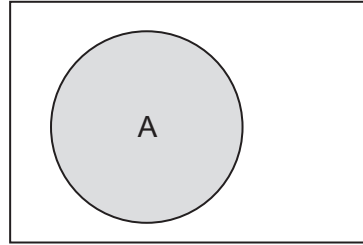
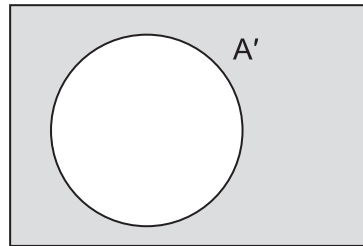
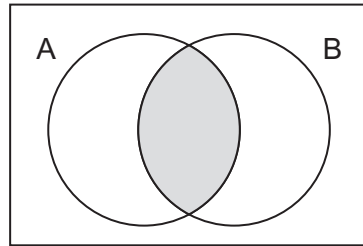
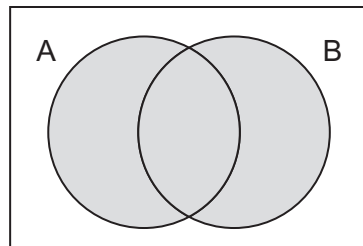


J U N 1 4 9 3 6 5 1 H B 0 1

Formulae Sheet: Higher Tier

Set notation

A

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

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

13 (a) Work out $1.56 \div 0.4$

[2 marks]

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Answer

13 (b) Write down a **decimal** that is more than $\frac{7}{11}$ and less than $\frac{7}{9}$

[2 marks]

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Answer

13 (c) Write down a **fraction** that is more than 41% and less than 42%

[2 marks]

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Answer

6

Turn over ►



14 The sum of the integers from 1 to 10 is 55

What is the sum of the integers from -10 to 13?

[2 marks]

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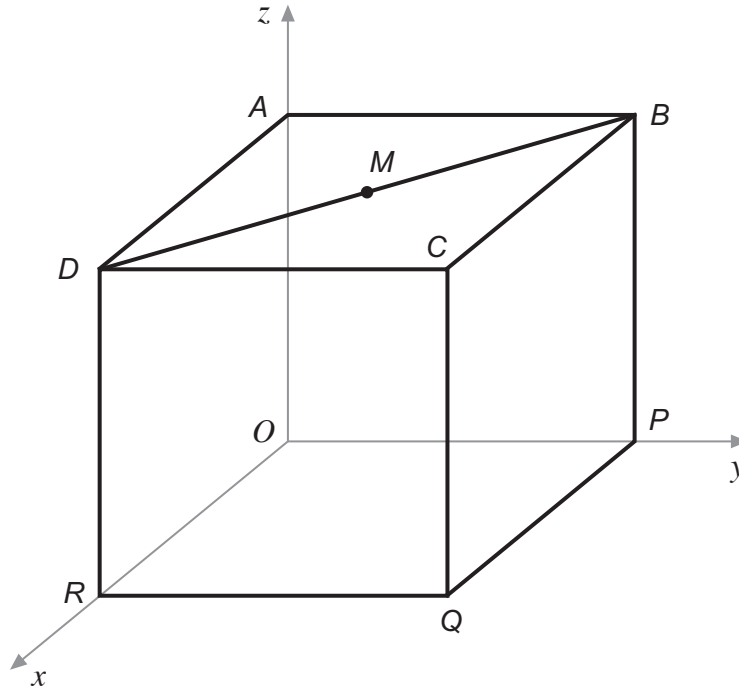
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Answer



- 15 The diagram shows a cube drawn on a 3-D coordinate grid.



The length of each side of the cube is 6 units.

Write down the coordinates of the midpoint, M , of the line BD .

[2 marks]

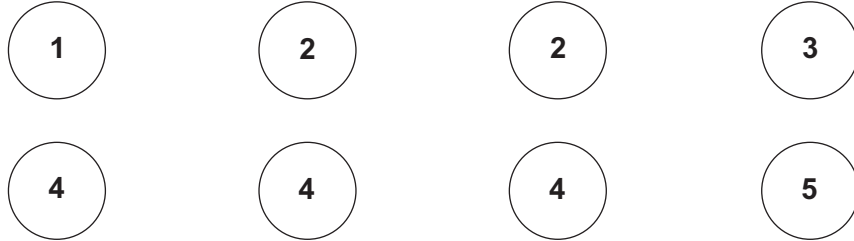
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Turn over for the next question



16 Two bags, A and B, contain numbered counters.
A counter is chosen at random from each bag.

Here are the 8 counters in bag A.



The table gives the probabilities of the numbers on the counters in bag B.

Number on counter	6	7	8	9
Probability	0.2	0.1	0.4	0.3

Which bag has the greater probability of choosing an **even** number?
You **must** show your working.

[2 marks]

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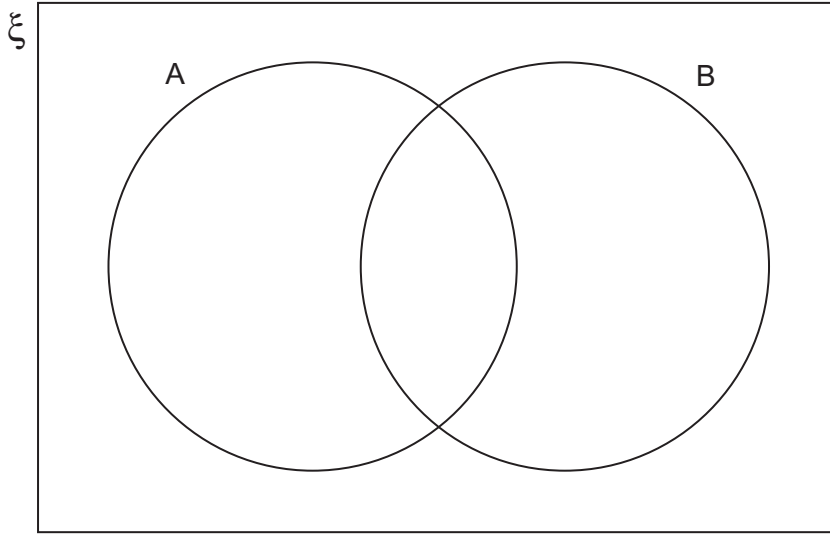
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Answer



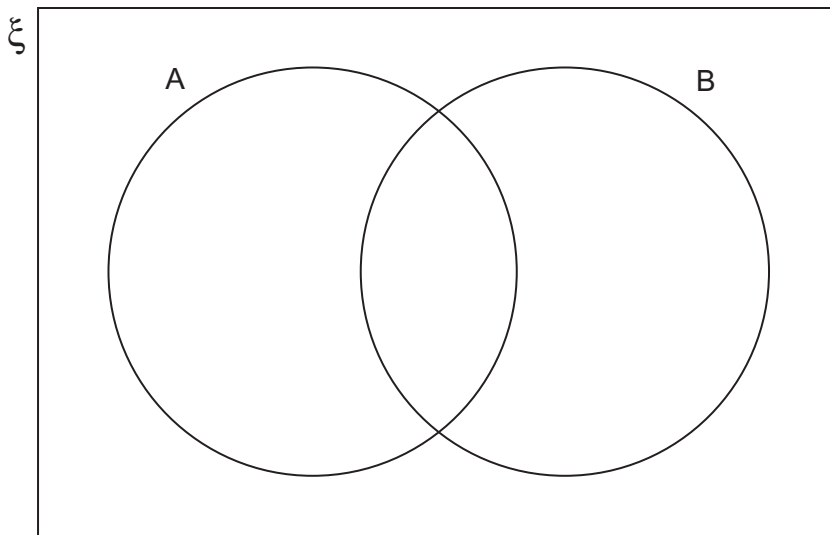
17 (a) Shade the Venn diagram to show the region $(A \cup B)'$

[1 mark]

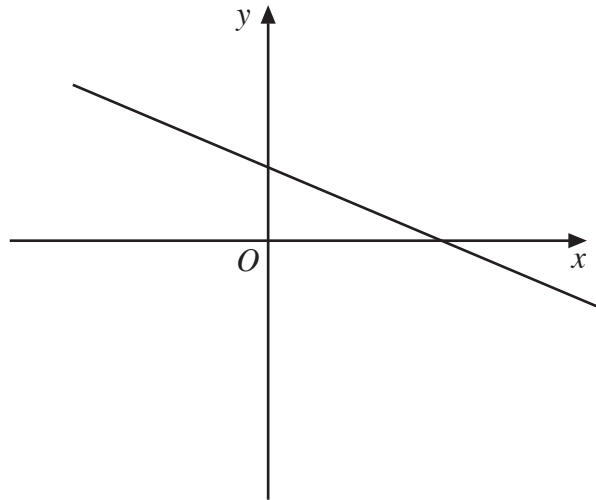


17 (b) Shade the Venn diagram to show the region $A \cap B'$

[1 mark]



18 Here is a sketch of the line $x + 2y = 8$



Work out the gradient of the line.

[3 marks]

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Answer



19 $10 < 5x \leq 35$

List the possible **integer** values of x .

[3 marks]

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Answer

20 $2^x \times 2^{2x} = 2^{18}$

Work out the value of 2^x

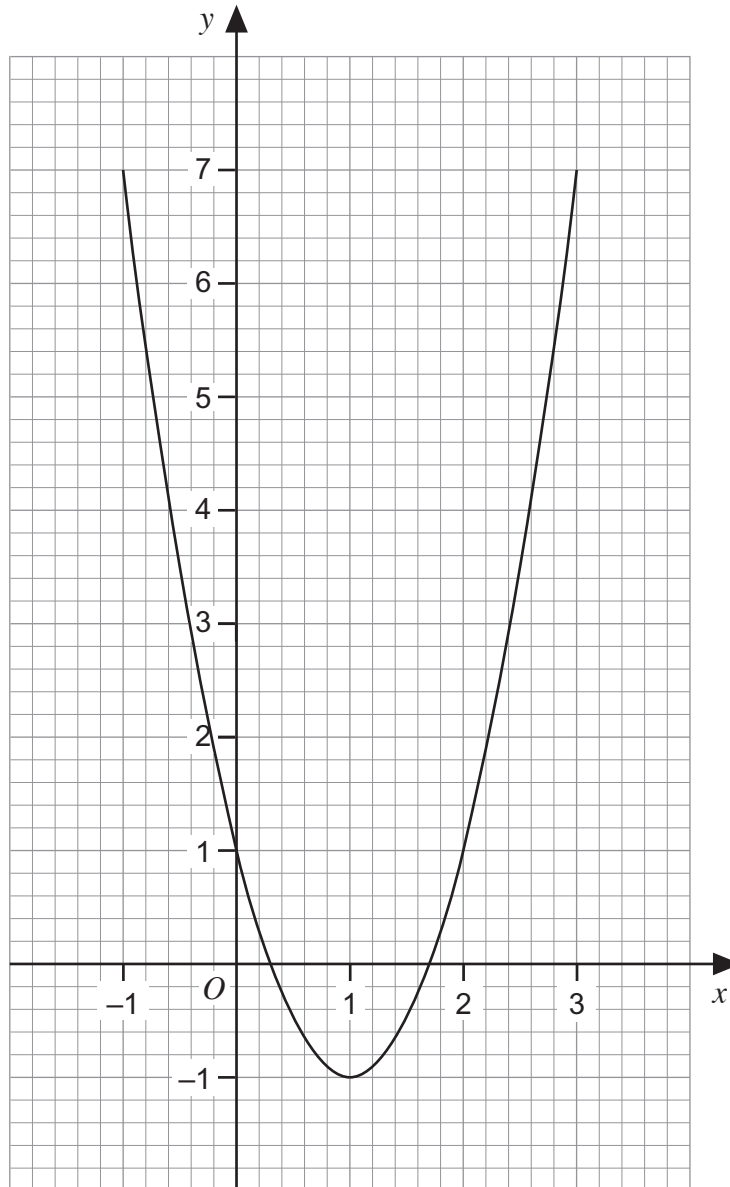
[3 marks]

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Answer



21 Here is the graph of $y = 2x^2 - 4x + 1$ for values of x from -1 to 3



Use the graph to estimate the solutions to $2x^2 - 4x + 1 = 5$

[2 marks]

Answer



22 (a) Show that $(a - b)^2 \equiv a^2 - 2ab + b^2$

[1 mark]

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22 (b) $(a + b)^2 = 1936$

$ab = 468$

Work out the value of $(a - b)^2$

[3 marks]

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Answer

6

Turn over ►



23

Work out $\sqrt{3} \times \sqrt{12} \times 5^{-2}$

Give your answer as a decimal.

[3 marks]

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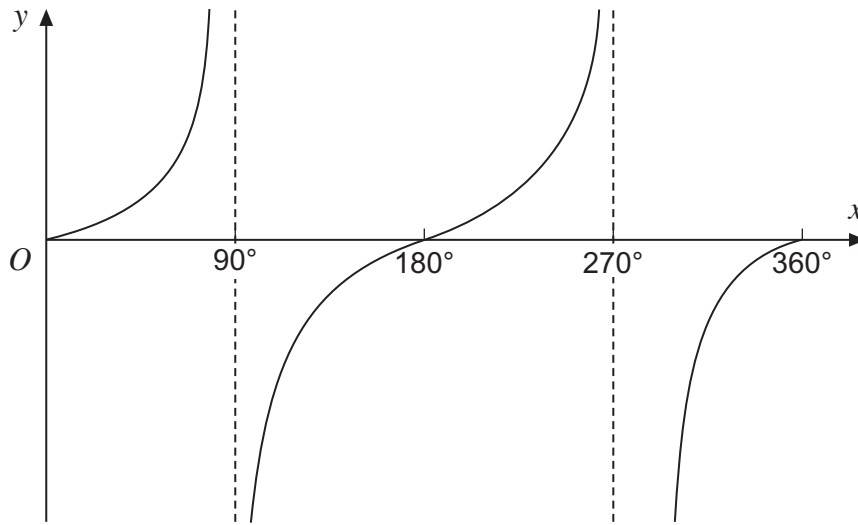
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Answer



24 (a) Circle a possible equation for the graph shown below.

[1 mark]



$$y = \frac{1}{x}$$

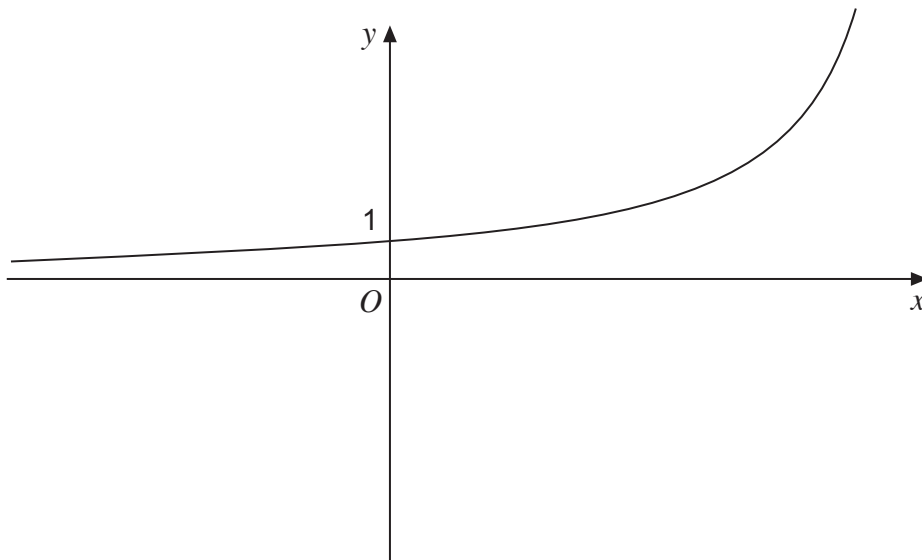
$$y = \sin x$$

$$y = 2^x$$

$$y = \tan x$$

24 (b) Circle a possible equation for the graph shown below.

[1 mark]



$$y = \frac{1}{x}$$

$$y = \sin x$$

$$y = 2^x$$

$$y = \tan x$$



25 Solve the simultaneous equations

$$4x + y = -3 \quad \text{and} \quad y = x^2 + 2x + 5$$

Do **not** use trial and improvement.
You **must** show your working.

[6 marks]

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Answer

END OF QUESTIONS

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