

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education
Higher Tier
June 2014

Mathematics

43602H

Unit 2

Monday 9 June 2014 9.00 am to 10.15 am

H

<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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For Examiner's Use	
Examiner's Initials	
Pages	Mark
2 – 3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16	
TOTAL	

Time allowed

- 1 hour 15 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.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 66.
- The quality of your written communication is specifically assessed in Questions 3, 4 and 18. These questions are indicated with an asterisk (*).
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

Advice

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



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

1 2476 adults watch a cricket match.

The ratio men : women is 3 : 1

How many **more** men than women watch the match?

[3 marks]

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Answer

2 Put the correct symbol in each box.

Choose from < > =

[3 marks]

11×12

22×6

3^2

2^3

$\frac{10}{0.5}$

10



*3 Here are three offers for a computer.

Tablet World

Usual price £170

20% off

IT Supplies

Usual price £180

$\frac{1}{4}$ off

PC Heaven

Special offer

Pay £23 each month for 6 months

Which offer is the cheapest?
You **must** show your working.

[6 marks]

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Answer

12

Turn over ►



4 (a) Factorise $x^2 - x$

[1 mark]

Answer

*4 (b) Hence, or otherwise, show that

$$(x - 1)^2 - (x - 1) \equiv (x - 1)(x - 2)$$

[2 marks]

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4 (c) Multiply out and simplify $5x(x - 3) - 8x$

[3 marks]

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Answer



5 (a) $123 \times 456 = 56\,088$

Write down the value of 12.3×45.6

[1 mark]

Answer

5 (b) $123 \times 456 = 56\,088$

Write down the value of $56\,088 \div 1.23$

[1 mark]

Answer

5 (c) $123 \times 456 = 56\,088$

Work out the value of 122×456

[2 marks]

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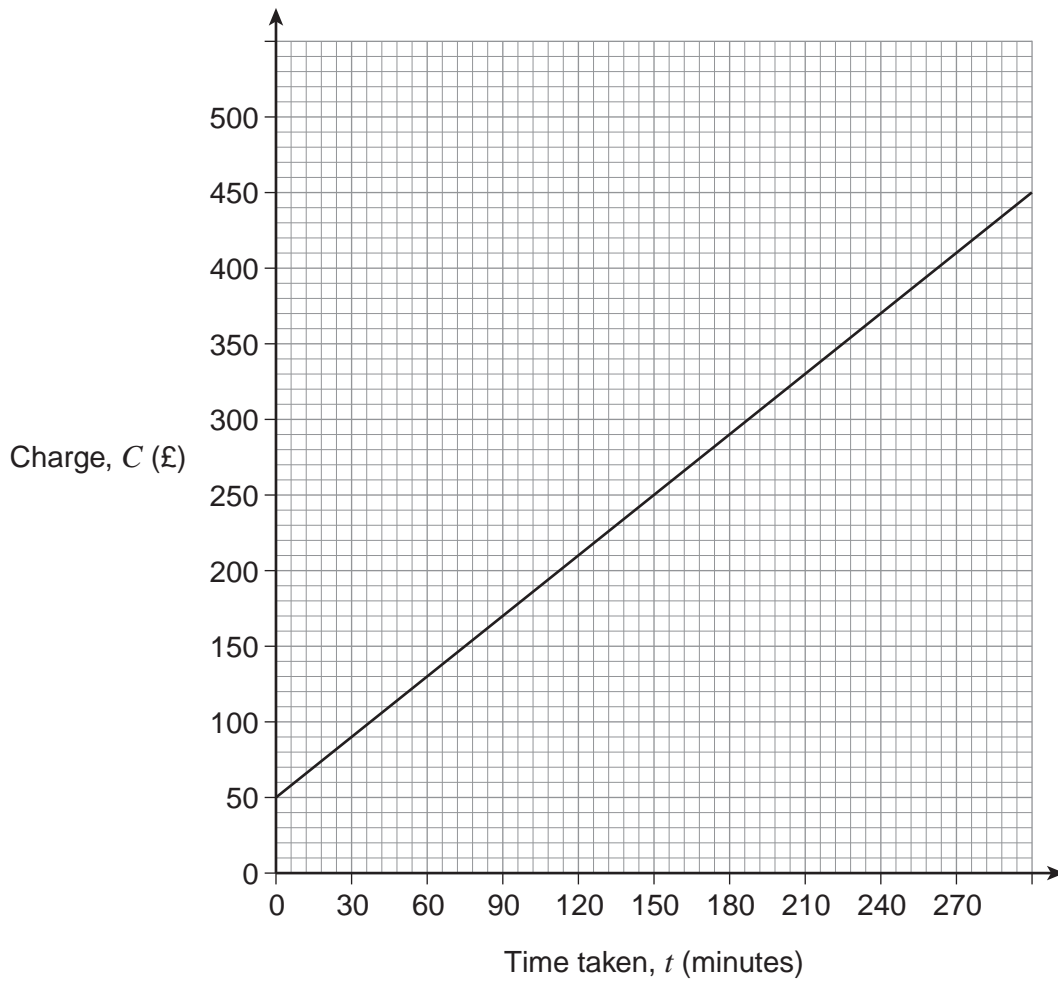
Answer

10

Turn over ►



6 Law firm A uses this graph to work out charges.



6 (a) Work out the equation of the line in terms of C and t .

[3 marks]

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Answer



6 (b) Law firm *B* uses this table to work out charges.

Time, t (minutes)	Charge, C (£)
$t \leq 60$	120
$t > 60$	$2t$

Draw a graph on the same grid to represent Law firm *B*'s charges.

[2 marks]

6 (c) How much cheaper is Law firm *A* than Law firm *B* for 3 hours?

[2 marks]

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Answer £

Turn over for the next question



7 I am thinking of a number.

My number is between 20 and 30
My number and 12 have only one common factor.

What number could I be thinking of?
Give all **three** possible answers.

[2 marks]

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Answer,,

8 Two positive fractions add up to $\frac{1}{3}$

Each fraction has a **different** value.

What could the fractions be?
Give **one** possible answer.

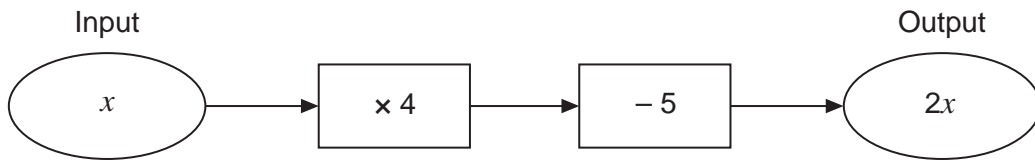
[3 marks]

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Answer + = $\frac{1}{3}$



9 Here is a number machine.



Work out the value of x .

[3 marks]

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$x =$

10 The equations of five straight lines are given below.
The line $y = 3x - 1$ is parallel to two of the lines.

Circle the equations of these **two** lines.

[2 marks]

$y = 3x$

$y = -1$

$y = -3x - 1$

$y = 2x - 1$

$y = 3x + 1$



- 11 (a)** In year 1, the value of a watch increases by 12%
In year 2, the value increases by the same **amount of money** as in year 1

The owner wants to work out the value of the watch at the end of year 2

Which multiplier can be used with the original value to work this out?
Circle your answer.

[1 mark]

1.12

1.24

1.12^2

1.24^2

- 11 (b)** In year 1, the value of a car decreases by 12%
In year 2, the value decreases by 12% of the value at the end of year 1

The owner wants to work out the value of the car at the end of year 2

Which multiplier can be used with the original value to work this out?
Circle your answer.

[1 mark]

0.76

0.88

0.76^2

0.88^2



12 Solve the simultaneous equations

$$3x - 4y = 20$$

$$4x - 2y = 25$$

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

[3 marks]

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Answer

Turn over for the next question

5

Turn over ►



13 x and y are integers such that

$$-5 < x \leq 3 \quad \text{and} \quad 2 \leq y \leq 7$$

Work out the **largest** possible value of $x^2 + y^2$

[2 marks]

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Answer



14 (a) Show that $(x + y)(x - y) \equiv x^2 - y^2$

[1 mark]

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14 (b) $x = 7\frac{4}{5}$ and $y = 2\frac{1}{5}$

Use part (a) to help you work out the value of $x^2 - y^2$

[3 marks]

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Answer

Turn over for the next question

6

Turn over ►



15 Solve the equation $(2 \times 10^5) x^2 = 1.8 \times 10^8$ **[4 marks]**

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$x = \dots\dots\dots$ Or $x = \dots\dots\dots$

16 Rearrange the formula $3c = \frac{4(c - d)}{d}$ **[4 marks]**
to make d the subject.

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Answer



17 Estimate the value of $101.4^{\frac{1}{2}} + 6.43^0 \times 7.99^{\frac{2}{3}}$ **[4 marks]**

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Answer

Turn over for the next question



***18** Prove that $5x(x + 6) - (3x + 5)^2$ is negative for all values of x .

[4 marks]

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END OF QUESTIONS

