

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
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16 – 17	
TOTAL	



General Certificate of Secondary Education  
Higher Tier  
June 2015

# Mathematics

43602H

## Unit 2

H

Thursday 4 June 2015 9.00 am to 10.15 am

<p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>mathematical instruments.</li> </ul> <p>You must <b>not</b> use a calculator.</p>	
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### 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 5 and 14. 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



Bag A



Bag B

Bag A contains £7.20 in 20p coins.

Bag B contains only 5p coins.

The number of coins in bag B is three-quarters of the number of coins in bag A.

How much money is in bag B?

**[4 marks]**

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Answer £ .....



2 The table shows information about grocery items.

	Small	Medium	Large
Bag of apples	–	495 grams	795 grams
Tin of fish	195 grams	285 grams	–
Packet of nuts	37 grams	57 grams	87 grams

Use approximations to estimate the **total** amount these items weigh.

- 2 large bags of apples
- 1 small tin of fish
- 2 medium packets of nuts

You **must** show your working.

[3 marks]

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Answer ..... grams

Turn over for the next question

7
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Turn over ►



**3**  $x + y = 100$

$x$  is a square number.  
 $y$  is a prime number.

Work out the values of  $x$  and  $y$ .

**[2 marks]**

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$x = \dots\dots\dots y = \dots\dots\dots$

**4** Solve  $5x - 6 = 3x + 7$

**[3 marks]**

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$x = \dots\dots\dots$



- \*5 (a)** Write 200 as the product of prime factors.  
Give your answer in index form.

**[3 marks]**

Answer .....

- 5 (b)** Circle the **two pairs** of numbers that have

Highest Common Factor (HCF) 4

**and**

Least Common Multiple (LCM) 60

**[2 marks]**

4 and 60

4 and 30

4 and 12

12 and 30

12 and 20



**6** The cash price for a boiler is £2000  
Customers can pay the cash price or pay monthly.

<p style="text-align: center;"><b>Cash Price</b> £2000</p>
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<p style="text-align: center;"><b>Pay Monthly</b> 60 monthly payments of £40</p>
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Work out the percentage increase from the cash price when paying monthly.

**[4 marks]**

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Answer ..... %



**7** Work out **all** the integers that satisfy the inequality  $8 < 2n \leq 16$  **[2 marks]**

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Answer .....

**8 (a)** Work out the value of  $8^1 + 8^0$  **[2 marks]**

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Answer .....

**8 (b)** Write  $6^{10} \div 6^2$  as a single power of 6 **[1 mark]**

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Answer .....

**8 (c)** Simplify fully  $5x^3y^2 \times 3x^4y^3$  **[2 marks]**

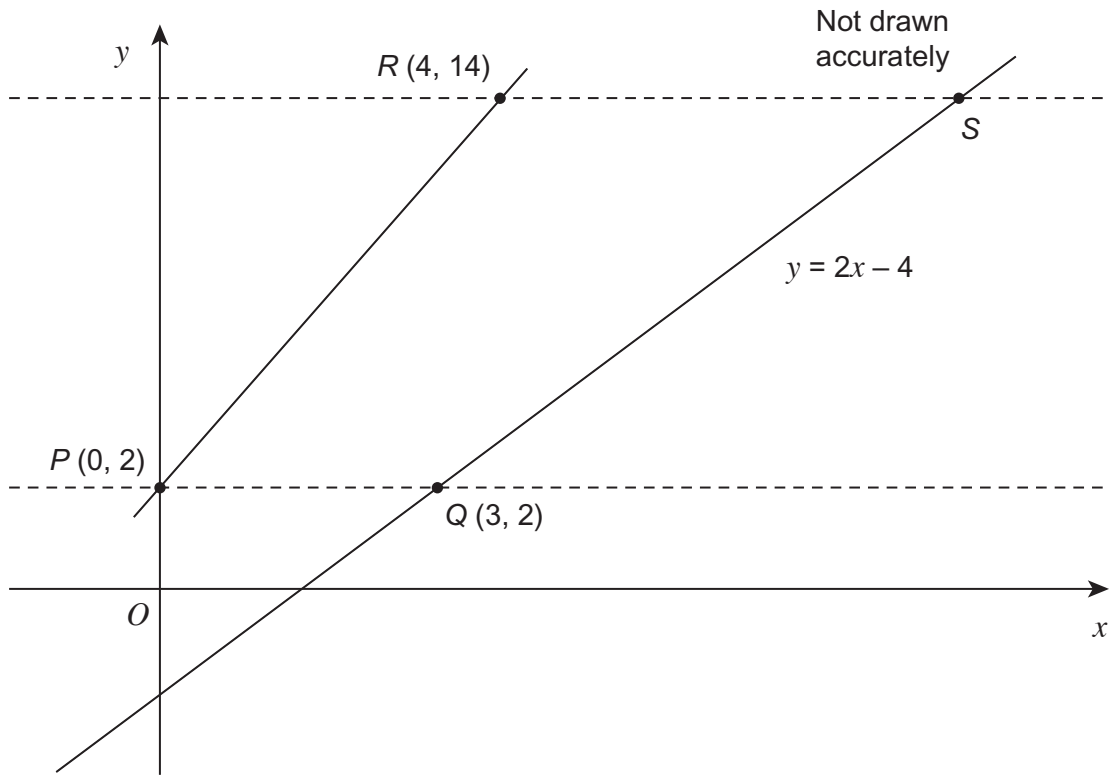
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Answer .....



9 The two dashed lines are both parallel to the  $x$  axis.



9 (a) Circle the equation of line  $PR$ .

[1 mark]

$y = 2x + 2$

$y = 3x + 2$

$y = 4x + 2$

$y = 3.5x + 2$

9 (b) The equation of line  $QS$  is  $y = 2x - 4$

Work out the ratio of lengths  $PQ : RS$

[3 marks]

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Answer ..... : .....





10

A pop concert has a crowd of 2000 people rounded to 1 significant figure.

A rock concert has a crowd of 2000 people rounded to 2 significant figures.

Work out the largest possible difference between the exact numbers of the two crowds.

**[3 marks]**

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Answer .....

**Turn over for the next question**

7
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**Turn over ►**



11 (a) Expand and simplify  $(x + 5)(x + 9)$

[2 marks]

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Answer .....

11 (b) Factorise fully  $5x^2 - 10xy$

[2 marks]

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Answer .....

12 Factorise  $9a^2 - b^2$

[2 marks]

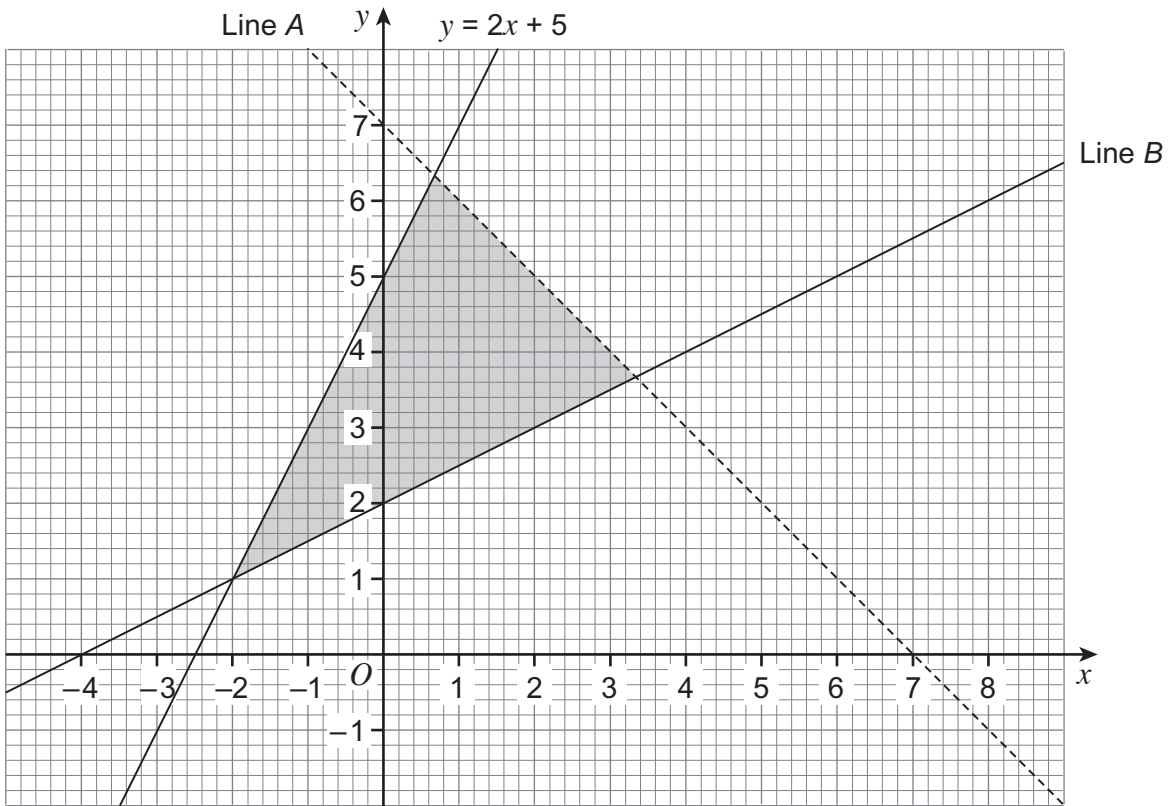
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Answer .....



13 Points in the shaded region satisfy three inequalities.

One of the inequalities is  $y \leq 2x + 5$



13 (a) Circle the inequality with boundary line A.

[1 mark]

$x + y \geq 7$

$x + y < 7$

$x + y \leq 7$

$x + y > 7$

13 (b) Circle the inequality with boundary line B.

[1 mark]

$2y \geq x + 4$

$2y \leq x + 4$

$y \geq x + 2$

$y \leq x + 2$



**\*14 (a)** Show that  $\frac{4}{9}$  is equivalent to  $0.\dot{4}$

**[1 mark]**

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**14 (b)** Using part (a), or otherwise, write  $0.9\dot{4}$  as a fraction.

**[2 marks]**

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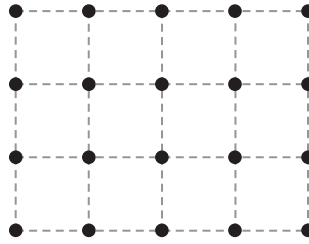
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Answer .....



15 A  $4 \times 3$  grid has 20 dots as shown.



15 (a) How many dots does an  $8 \times 6$  grid have?

[1 mark]

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Answer .....

15 (b) How many dots does a  $4 \times y$  grid have?

[1 mark]

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Answer .....

15 (c) How many dots does an  $x \times y$  grid have?

[1 mark]

.....

Answer .....

15 (d) How many dots does a  $2x \times y$  grid have?

[1 mark]

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Answer .....

7
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Turn over ►



16 Make  $y$  the subject of  $x = \frac{5y + 4}{2y - 3}$

[4 marks]

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Answer .....



**17**  $(3x - 1)(ax + b) \equiv 12x^2 - 19x + c$

Work out the values of  $a$ ,  $b$  and  $c$ .

**[4 marks]**

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$a = \dots\dots\dots b = \dots\dots\dots c = \dots\dots\dots$

**Turn over for the next question**

8
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**Turn over ►**



18 (a) Simplify fully  $\sqrt{72}$

Circle your answer.

[1 mark]

$36\sqrt{2}$

$3\sqrt{8}$

$6\sqrt{2}$

$2\sqrt{18}$

18 (b) Given that  $p = \sqrt{3}$   $q = \sqrt{8}$  and  $r = \sqrt{6}$

work out the value of  $\frac{pq}{r}$

[2 marks]

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Answer .....





19 Solve the simultaneous equations

$$y = x^2 - 6x - 20$$

$$y = 4 - x$$

You **must** show your working.

[5 marks]

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Answer .....

**END OF QUESTIONS**



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