Centre Number						Candidate Number					

Surname

Other Names

Candidate Signature

AQA

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

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.

For Examiner's Use	
Examiner's Initials	

Pages	Mark
2 – 3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16 – 17	
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 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.

43602H

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

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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$x =$ .... $y =$ ....

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

[3 marks]

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$x =$ ....

*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

10

Turn over ▶

0 5

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

Cash Price	**Pay Monthly**
£2000	60 monthly payments of £40

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 $8 < 2n \leqslant 16$

[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 ....

11

Turn over ▶

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

Not drawn accurately

R (4, 14)

S

$y = 2x - 4$

P (0, 2)

Q (3, 2)
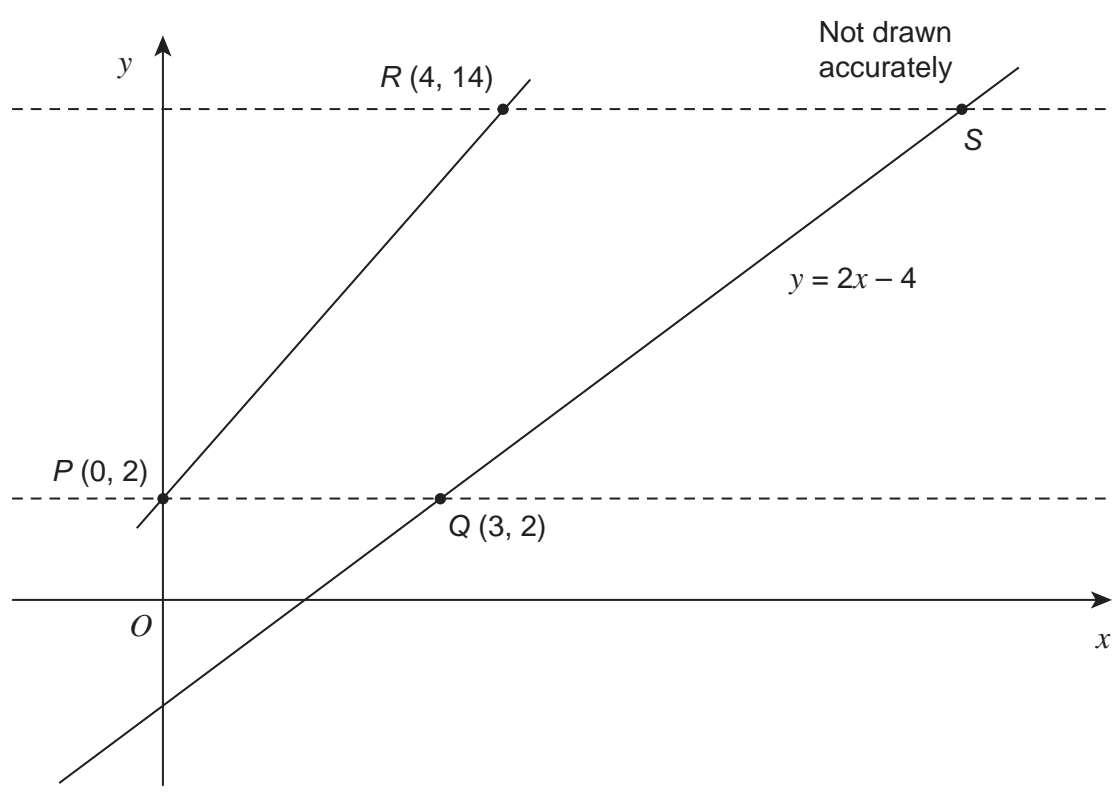
9 (a) Circle the equation of line *PR*.

[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

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 $y \leqslant 2x + 5$
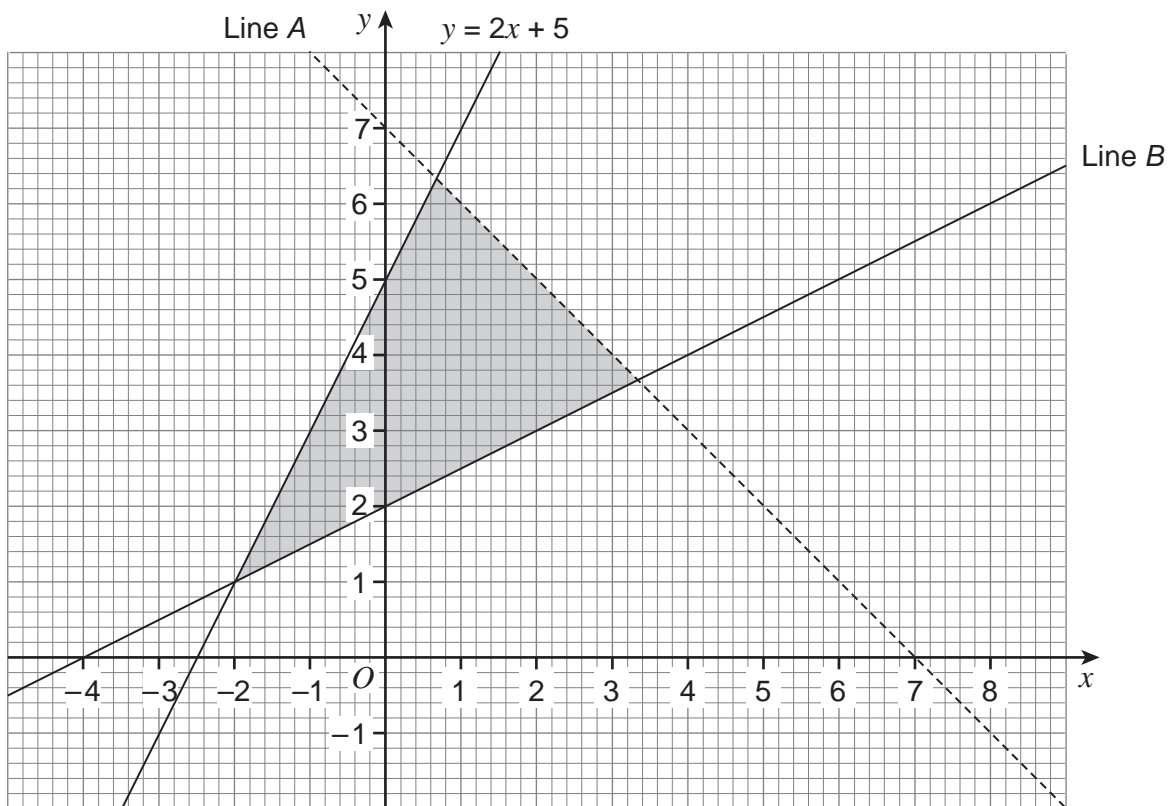
13 (a) Circle the inequality with boundary line *A*.

[1 mark]

$x + y \geqslant 7$ $\qquad$ $x + y < 7$ $\qquad$ $x + y \leqslant 7$ $\qquad$ $x + y > 7$

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

[1 mark]

$2y \geqslant x + 4$ $\qquad$ $2y \leqslant x + 4$ $\qquad$ $y \geqslant x + 2$ $\qquad$ $y \leqslant x + 2$

8

*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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Answer ....

15   A 4×3 grid has 20 dots as shown.
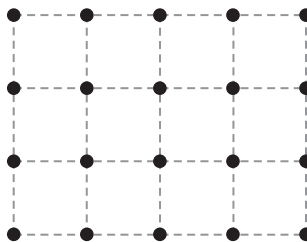
15 (a)   How many dots does an 8×6 grid have?

[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

Turn over ▶

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

[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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$a =$ .... $b =$ .... $c =$ ....

Turn over for the next question

8

Turn over ▶

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

Circle your answer.

[1 mark]

$36\sqrt{2}$ $\qquad$ $3\sqrt{8}$ $\qquad$ $6\sqrt{2}$ $\qquad$ $2\sqrt{18}$

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

work out the value of $\qquad$ $\dfrac{pq}{r}$

[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

8

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