| Centre Number | | | | | | Candidate Number | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Surname | | | | | | | | | | |
| Other Names | | | | | | | | | | |
| Candidate Signature | | | | | | | | | | |

| 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 | |

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.

**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

**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**

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

| **Cash Price** |
| --- |
| £2000 |

| **Pay Monthly** |
| --- |
| 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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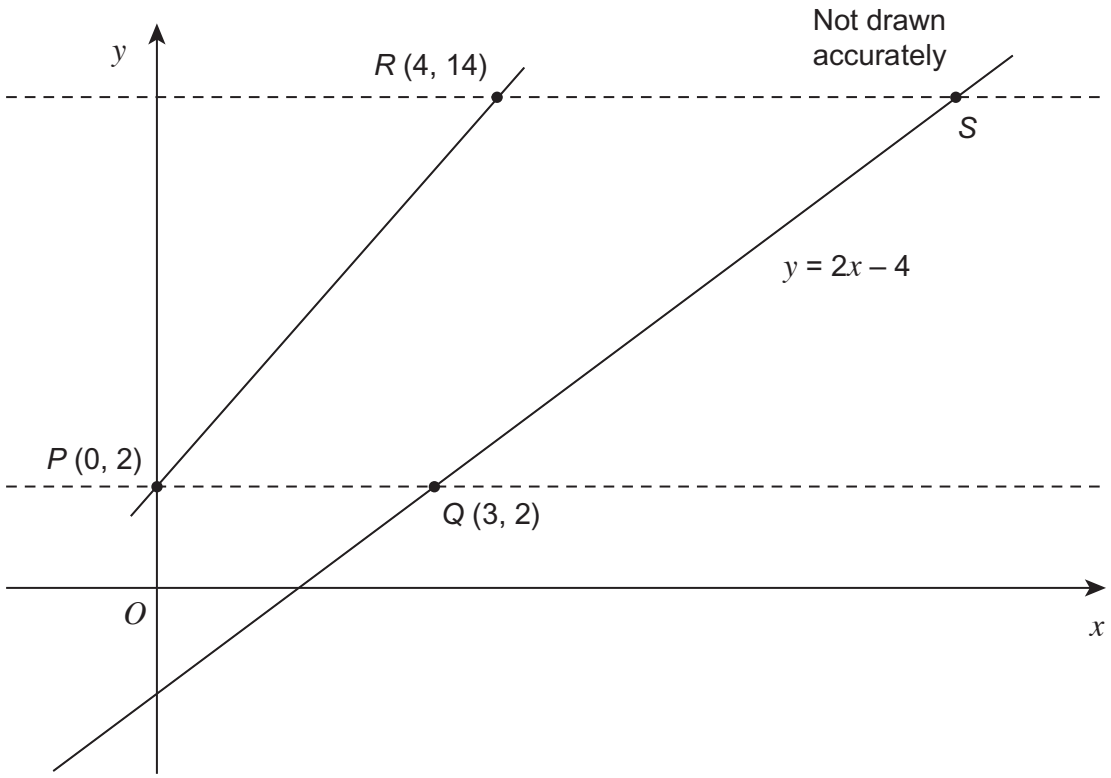
Answer .....

11

**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

**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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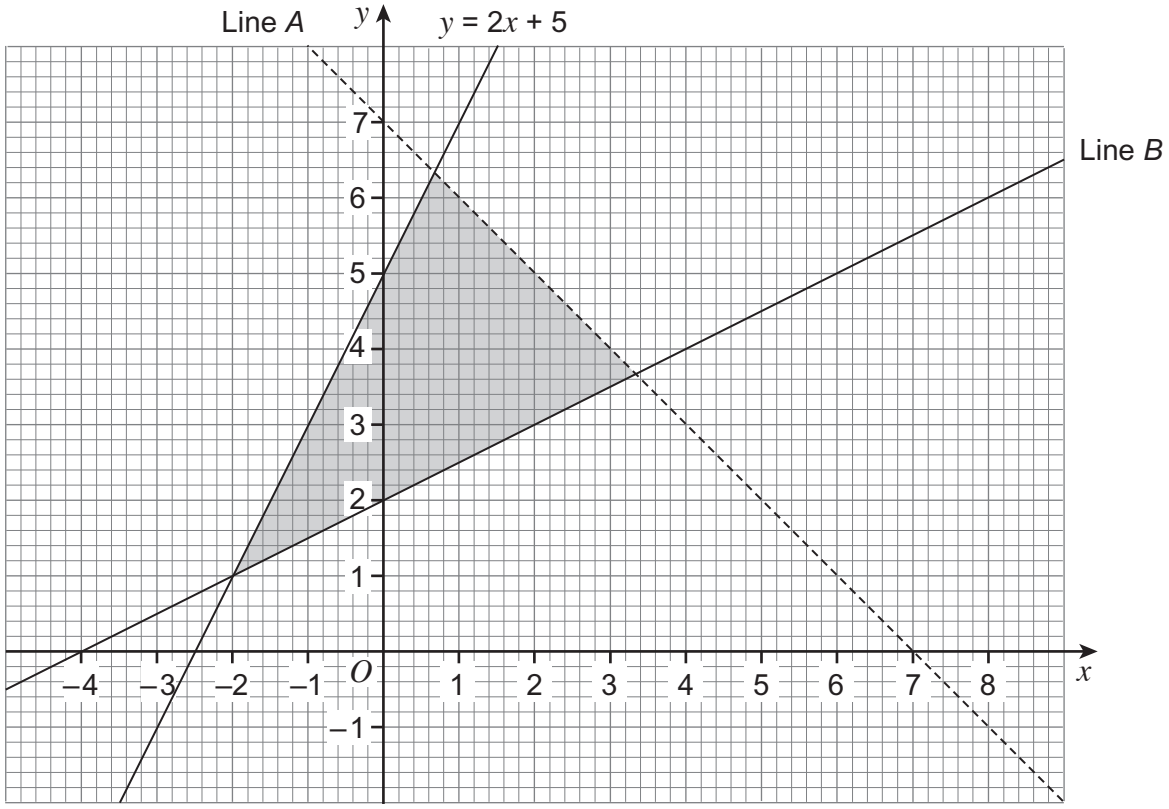
Answer .....

**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]**

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

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

**[1 mark]**

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

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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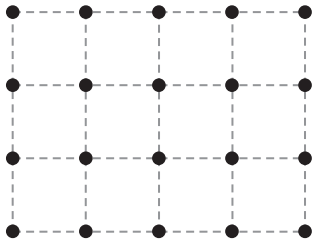
Answer .....

**15** A $4 \times 3$ 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]**

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Answer .....

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

**[1 mark]**

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Answer .....

7

**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

**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]**

Answer .....

**END OF QUESTIONS**

8

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