

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
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14 – 15	
TOTAL	



General Certificate of Secondary Education  
Higher Tier  
November 2014

# Mathematics

## 43602H

### Unit 2

Wednesday 5 November 2014 9.00 am to 10.15 am

# H

#### 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 space 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 2, 3, 8 and 15. 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 booklet.

#### Advice

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



N 0 V 1 4 4 3 6 0 2 H 0 1

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

**1**       $346 \times 27 = 9342$

**1 (a)**    Work out       $34.6 \times 2.7$

Circle your answer.

**[1 mark]**

934.2

93.42

9.342

0.9342

**1 (b)**    Work out       $\frac{9342}{270}$

Circle your answer.

**[1 mark]**

3460

346

34.6

3.46

**\*2**      The price of a book is £4  
In a sale the price is reduced by 30%

Work out the sale price.

**[3 marks]**

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Answer £ .....



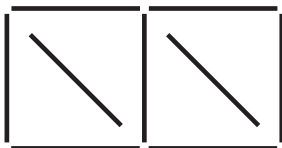


4 These patterns are made using sticks.

Pattern 1



Pattern 2



Pattern 3



The number of sticks in each pattern form a sequence.

4 (a) Show that the first five patterns use a total of 65 sticks.

[2 marks]

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4 (b) Work out the  $n$ th term of the sequence.

[2 marks]

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Answer .....



5 Tom has £30 more than Ann.  
They have £110 in total.

What fraction of the total does Tom have?

[3 marks]

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Answer .....

6 Expand and simplify  $3(2x + 5) - 2(x - 4)$

[3 marks]

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Answer .....

10

Turn over ►



7 (a) Solve  $5x - 11 \geq 29$

[2 marks]

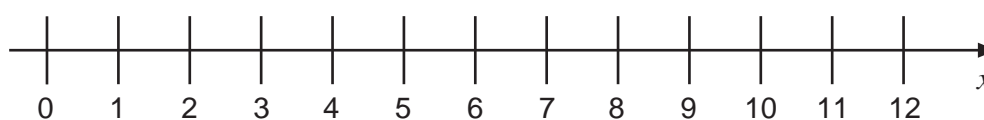
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Answer .....

7 (b) Show the solution of  $3x < 12$  on the number line.

[2 marks]

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**\*8** There are 200 students in Year 10  
110 are boys.

There are 250 students in Year 11  
140 are boys.

Which year has the greater proportion of **boys**?  
You **must** show your working.

**[3 marks]**

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Answer .....

**Turn over for the next question**

7

**Turn over ▶**



9 (a) Factorise  $x^2 + 10x + 24$

[2 marks]

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Answer .....

9 (b) Hence or otherwise, solve  $x^2 + 10x + 24 = 0$

[1 mark]

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Answer .....





10 One lap of a racing circuit is  $3\frac{3}{4}$  km

Work out the total distance for  $4\frac{1}{2}$  laps.

[3 marks]

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Answer ..... km

11 Rearrange  $4x + 3y = 12$  to make  $y$  the subject.

[2 marks]

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Answer .....

8

Turn over ►



**12**  $y = 5x - 4$  is the equation of a straight line.

**12 (a)** Write down the gradient of the line  $y = 5x - 4$

**[1 mark]**

Answer .....

**12 (b)** Write down the coordinates of the y-intercept of the line  $y = 5x - 4$

**[1 mark]**

Answer ( ..... , ..... )

**13** Work out the value of  $5.4 \times 10^5 \times 2 \times 10^{-2}$

Give your answer in standard form.

**[2 marks]**

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Answer .....



**14** At a fish and chip shop

2 fish and 1 portion of chips cost £10.05  
3 fish and 4 portions of chips cost £19.20

Work out the cost of 4 fish and 3 portions of chips.

**[4 marks]**

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Answer £ .....

**Turn over for the next question**

8

**Turn over ►**



**\*15** Write  $\frac{4}{x-2} - \frac{3}{x}$  as a single fraction.

**[3 marks]**

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Answer .....

**16**  $\sqrt{10} (3\sqrt{20} + 7\sqrt{5})$  simplifies to  $a\sqrt{2}$

Work out the value of  $a$

**[3 marks]**

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Answer .....



17 Expand and simplify  $(5x - 2y)(3x - 4y)$

[3 marks]

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Answer .....

18 Write  $x^2 + 8x + 7$  in the form  $(x + a)^2 + b$

[3 marks]

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Answer .....



**19**  $R$  is the total resistance in an electronic circuit.

$R$  is calculated using the formula  $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$

$R_1 = 0.6$  and  $R_2 = 1.8$

Work out the value of  $R$ .

**[4 marks]**

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Answer .....



20 Work out the value of  $8^{-\frac{2}{3}}$  [2 marks]

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Answer .....

21  $2^m = 32$  and  $9^p = 3^m$   
Work out the values of  $m$  and  $p$  [4 marks]

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$m = \dots\dots\dots p = \dots\dots\dots$

**END OF QUESTIONS**

**10**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

