Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
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10–11	
TOTAL	

General Certificate of Secondary Education
Higher Tier
June 2013

Mathematics 43602H

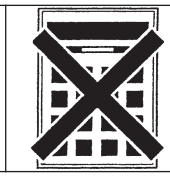
Unit 2

Tuesday 11 June 2013 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 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 8. 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 Use approximations to estimate the value of $\dfrac{20.02 \times 0.49}{1.99}$

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Answer ..... *(3 marks)*

2 A sequence increases by 5 each time.
The first term is x.

2 (a) Write down an expression for the second term.

Answer ..... *(1 mark)*

2 (b) The sum of the first four terms is 54.

Set up and solve an equation to work out the value of x.

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x = ... *(4 marks)*

3 The cost, C pence, of x cups of tea and y cups of coffee is given by

$$C = 30x + 50y$$

3 (a) Circle the cost of a cup of tea.

30p 50p £30 £50

(1 mark)

***3 (b)** Work out the total cost, in pounds, of four cups of tea and five cups of coffee.

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Answer £ ..... *(3 marks)*

***4** What fraction is half way between $\frac{1}{4}$ and $\frac{1}{2}$?

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Answer ..... *(3 marks)*

15

5 (a) Expand and simplify $3(2x + 4) + 2(x + 1)$

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Answer ..... *(3 marks)*

5 (b) Factorise $x^2 - 11x$

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Answer ..... *(1 mark)*

6 x, y and $x - y$ are all two-digit numbers.

x is a square number

y is a cube number

$x - y$ is a prime number

Find **one** possible pair of values for x and y.

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x = ... , y = ... *(3 marks)*

7 (a) Solve $4x - 7 \leqslant 13$

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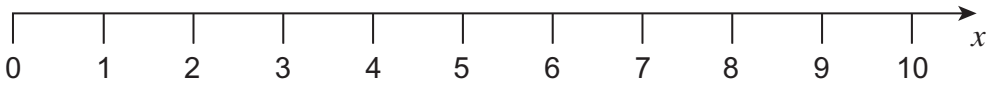
Answer ..... *(2 marks)*

7 (b) Show $3 < x \leqslant 8$ on the number line.



(2 marks)

***8** Simplify fully $\dfrac{4a + b - 2a + 3b}{3a + 2b + 2b + 2b}$

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Answer ..... *(4 marks)*

15

9 A cinema has three screens.
600 people visit the cinema.

35% go to screen 1.

Four times as many go to screen 2 as go to screen 3.

How many people go to screen 2?

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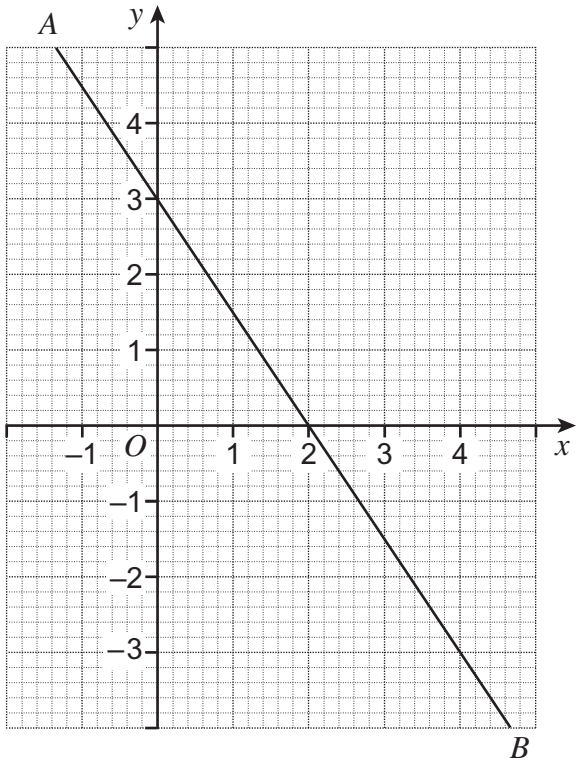
Answer ..... *(4 marks)*

10 (a) Work out the equation of line AB.



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Answer ..... *(3 marks)*

10 (b) Work out the equation of the line passing through (2, –3) and parallel to the line $y = 3x + 4$

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Answer ..... *(2 marks)*

9

11 $\frac{9}{10}$ of the runners who started a marathon completed it.

$\frac{1}{5}$ of those who completed it are women.

180 women completed the marathon.

How many runners started the marathon?

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Answer ..... *(3 marks)*

12 Make t the subject of the formula $w = 3 + \sqrt{t}$

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Answer ..... *(2 marks)*

13 Solve the simultaneous equations.

$$2x + 3y = 53$$
$$3x - y = 19$$

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

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x = ... , y = ... *(4 marks)*

14 (a) Write down the value of 10^0

Answer ..... *(1 mark)*

14 (b) Write 5^{-3} in standard form.

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Answer ..... *(3 marks)*

13

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

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Answer ..... *(3 marks)*

16 (a) Simplify fully $\frac{\sqrt{8}}{\sqrt{2}}$

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Answer ..... *(2 marks)*

16 (b) $\sqrt{6} \times \sqrt{5} \times \sqrt{4} \times \sqrt{3} \times \sqrt{2} \times \sqrt{1} = k\sqrt{5}$

Work out the value of k.

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Answer ..... *(3 marks)*

17 I am thinking of two numbers.

The first number is x.
The second number is 7.5 **more** than x.

17 (a) Write down an expression, in terms of x, for the second number.

Answer ..... *(1 mark)*

17 (b) For the two numbers,

the product is double the sum.

Work out the numbers I could be thinking of.
Give **both** possible pairs of answers.

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Answer ..... and .....

or

..... and ..... *(5 marks)*

END OF QUESTIONS

14

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED