Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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

AQA

General Certificate of Secondary Education
Higher Tier
November 2013

Mathematics 43602H

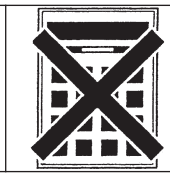
Unit 2

H

Friday 8 November 2013 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 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 book.

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

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

1 Solve $5x - 2 = x + 16$

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x = ... *(3 marks)*

2 The table shows the cost of a short break at a holiday park.

Holiday starts in	Adult	1st and 2nd Child	3rd and 4th Child
June	£199 each	£39 each	FREE
July	£299 each	£49 each	£19 each
August	£349 each	£59 each	£39 each

Mr and Mrs Hyde and their three children want a short break starting on 28 July.

2 (a) Use approximations to **estimate** the cost of this short break.
You **must** show your working.

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Answer £ ..... *(3 marks)*

2 (b) Work out **exactly** how much **more** it would cost if they went in August instead of July.

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Answer £ ..... *(2 marks)*

8

3 (a) Show that 125 is a cube number.

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(1 mark)

3 (b) 125 = a + b

a and b are square numbers.

Find **two** possible pairs of values for a and b.

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a = ... b = ...

and a = ... b = ... *(2 marks)*

4 Kerry needs $\frac{2}{3}$ of a tank of petrol to drive home.

She has $\frac{5}{8}$ of a tank of petrol.

Does she have enough petrol to drive home?
You **must** show your working.

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(2 marks)

5 (a) Write 36 as the product of prime factors.
Give your answer in index form.

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

5 (b) Work out the Highest Common Factor (HCF) of 36 and 81.

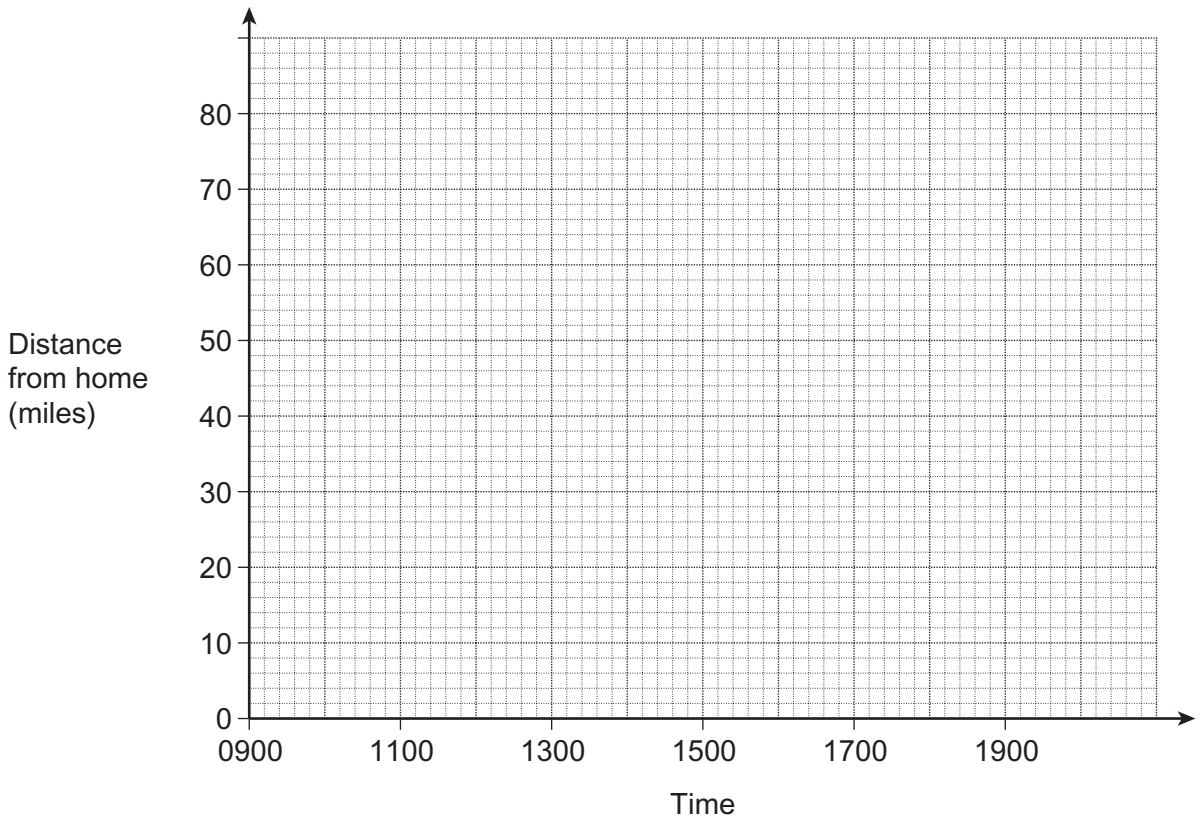
Answer ..... *(2 marks)*

10

6 Josh drove to a meeting and then back home.
The meeting was 80 miles from his home.

- Josh left home at 9 am
- He arrived at the meeting after 2 hours
- He left for home $4\frac{1}{2}$ hours later
- He drove 30 miles in half an hour
- He then stopped for 1 hour
- He arrived home $1\frac{1}{2}$ hours later.

Show this information on the distance-time graph below.



(4 marks)

7 (a) Multiply out and simplify $10(2x - 1) - 20x$

.....

.....

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

7 (b) Factorise $a^2 + ab + a$

.....

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

7 (c) Solve $2x - 1 > 9$

.....

.....

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

Turn over for the next question

10

***8** Customers at a shop who spend £100 or more can pay by these methods.

A	12 payments	Each payment is 10% of the cost price
B	24 payments	Each payment is 6% of the cost price
C	36 payments	Each payment is 4% of the cost price

Which method is the cheapest?
You **must** show your working.

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

9 (a) A sequence starts 4 8 12 16 ...

The nth term is $4n$

Circle the nth term of this sequence 6 10 14 18 ...

$4n$ $6n$ $4n + 2$ $6n + 2$

(1 mark)

9 (b) These points are in a straight line.

Point 1 (4, 6)

Point 2 (8, 10)

Point 3 (12, 14)

Point 4 (16, 18)

Write down the coordinates of Point n in this sequence.

.....

Point n (..... , ...) *(1 mark)*

9 (c) Work out the equation of the straight line that passes through these points.

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

7

10 The manager of a theatre records the attendance figure for a show to 2 significant figures.

A newspaper rounds the manager's figure to 1 significant figure.

THEATRE NEWS

500 attend show

What is the lowest and highest possible actual attendance?

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Lowest .....

Highest .....

(3 marks)

11 (a) Multiply out and simplify $(x - 6)(x - 5)$

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

11 (b) Simplify fully $2a^2b^3 \times 4a^5b^6$

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

12 Write the number 4540 million in standard form.

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

Turn over for the next question

9

13 A tin contains red beads, white beads and blue beads in the ratio

red : white : blue = $x : 2x : x^2$

13 (a) Show that the fraction of blue beads in the tin is $\frac{x}{x + 3}$

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(2 marks)

13 (b) The percentage of blue beads is 90%

Work out the value of x.

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

14 Factorise $4x^2 - y^2$

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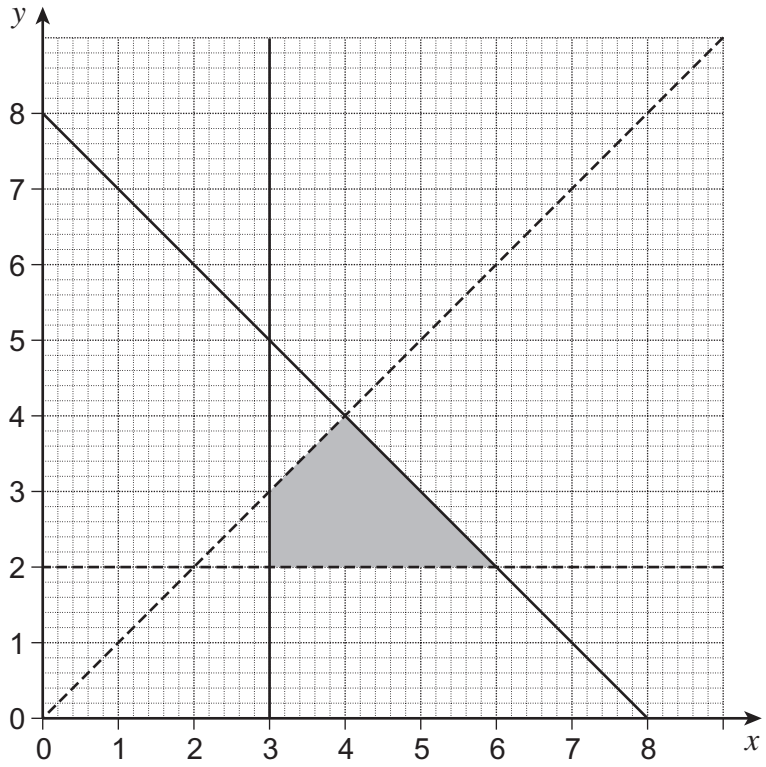
Answer ..... *(2 marks)*

***15** Use inequalities to describe the shaded area on the grid.



Answer .....

.....

(4 marks)

11

Turn over ▶

16 Put these in order starting with the smallest.
You **must** show the value of each number in your working.

$9^{\frac{1}{2}}$ $(-7)^0$ $\left(\frac{1}{8}\right)^{-\frac{1}{3}}$

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Smallest .....

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Largest .....

(4 marks)

17 Solve $\frac{3}{x-1} - \frac{4}{x+2} = 2$

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Answer ..... *(7 marks)*

END OF QUESTIONS

11

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED