

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	
TOTAL	



General Certificate of Secondary Education
Higher Tier
November 2013

Mathematics

43602H

Unit 2

Friday 8 November 2013 9.00 am to 10.15 am

H

<p>For this paper you must have:</p> <ul style="list-style-type: none"> mathematical instruments. <p>You must not use a calculator.</p>	
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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)



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

.....
.....
(1 mark)

3 (b) $125 = a + b$

a and b are square numbers.

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

.....
.....
.....
.....
.....

$a = \dots\dots\dots b = \dots\dots\dots$

and $a = \dots\dots\dots b = \dots\dots\dots$ (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

Turn over ►

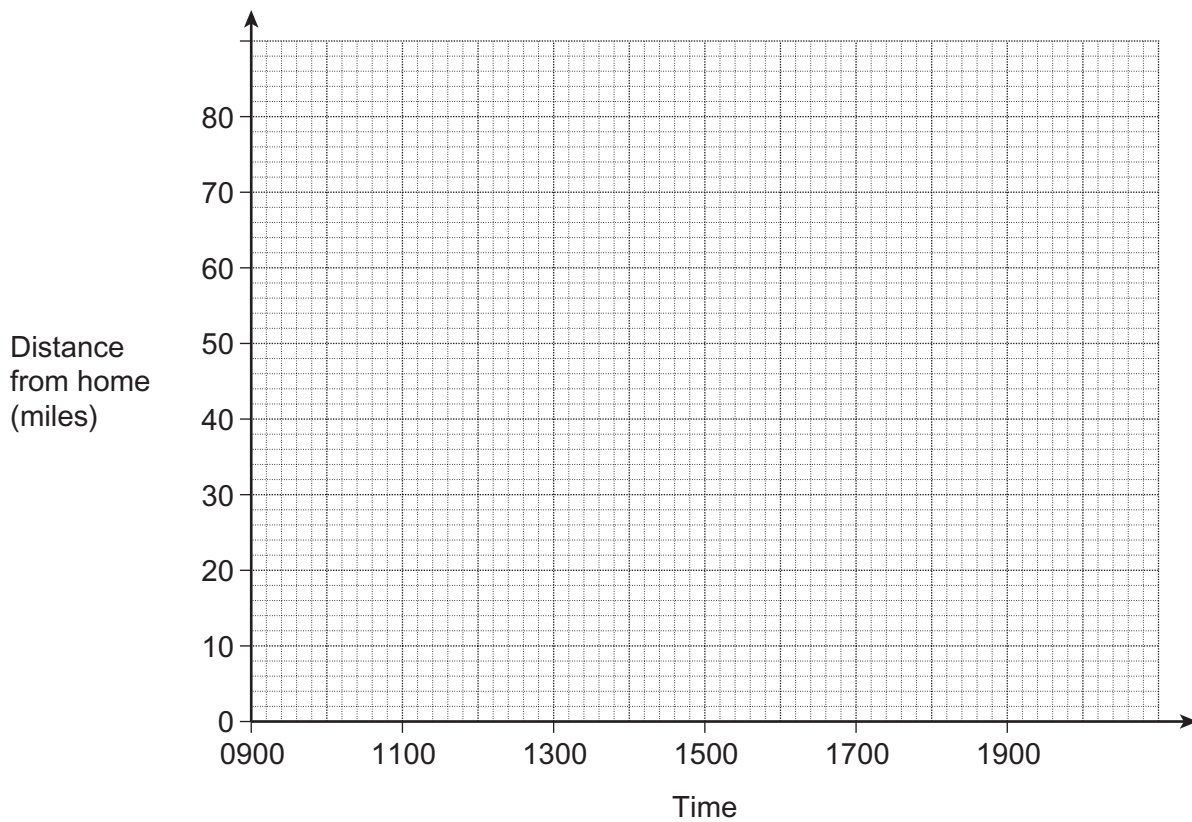


6

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



***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 n th term is $4n$

Circle the n th 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)



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



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

$$\text{red : white : blue} = x : 2x : x^2$$

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)

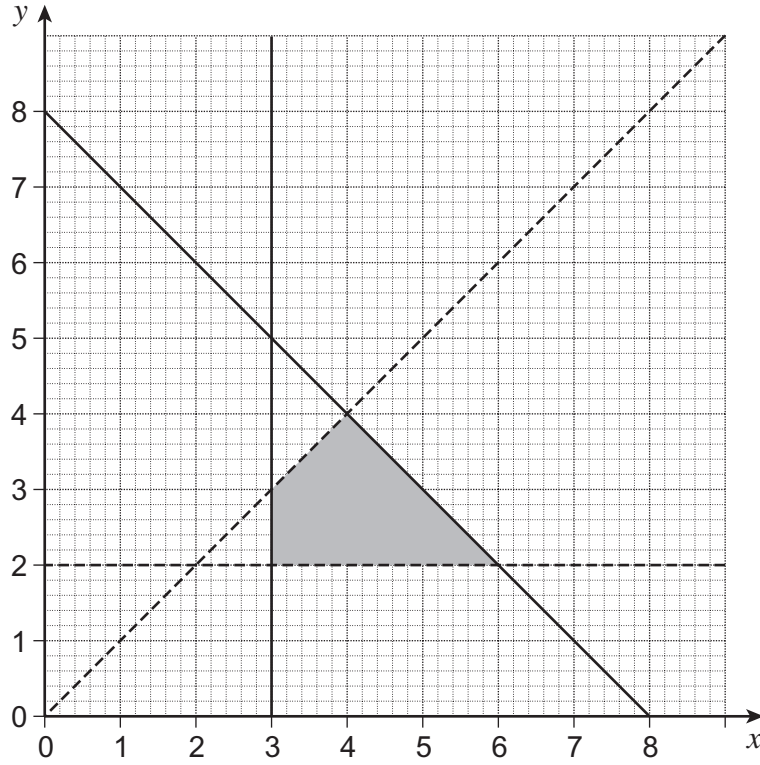
14 Factorise $4x^2 - y^2$

.....
.....

Answer (2 marks)



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



Answer

.....

(4 marks)



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



There are no questions printed on this page

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

