

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
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TOTAL	



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

<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 $5x - 2 = x + 16$

.....

.....

.....

.....

.....

$x =$ (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.

.....

.....

.....

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.

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

(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 ►

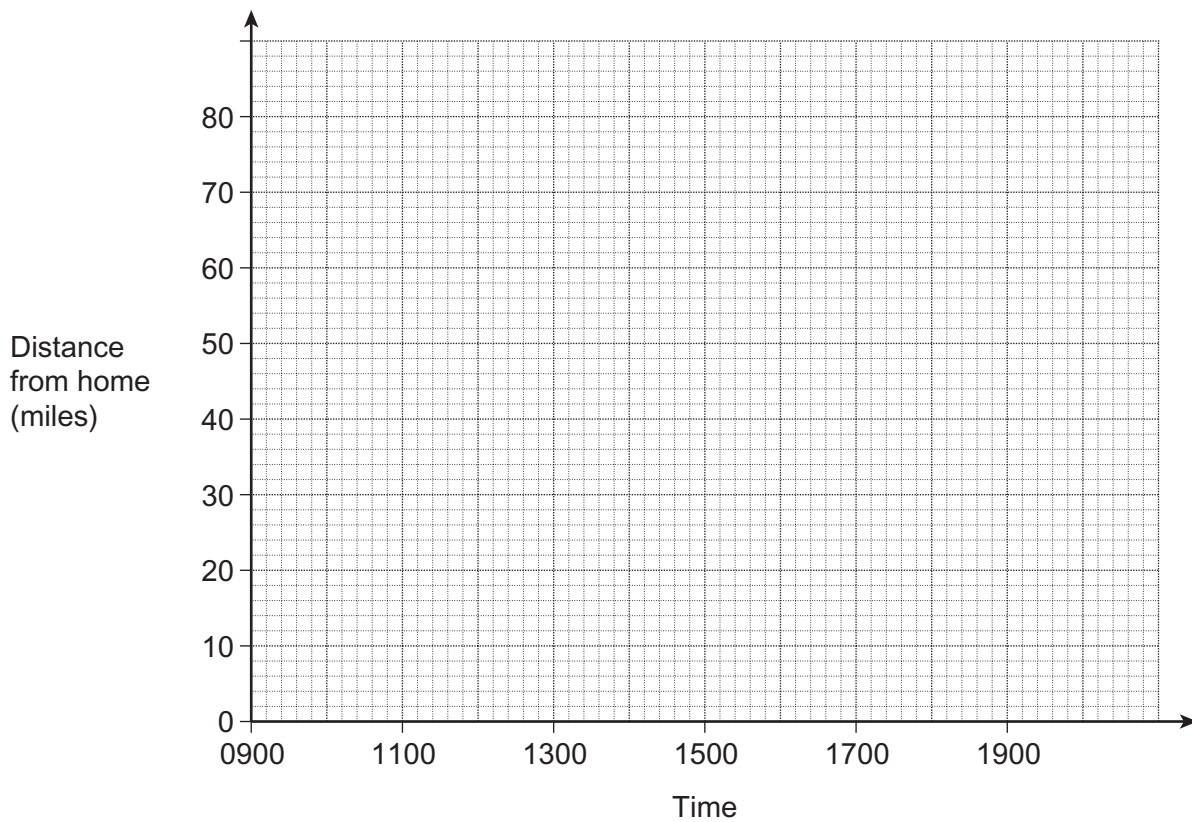


6

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.

.....

.....

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?

.....

.....

.....

Lowest

Highest

(3 marks)



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

.....
.....

Answer (2 marks)

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

.....
.....

Answer (2 marks)

12 Write the number 4540 million in standard form.

.....
.....

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 .

.....

.....

.....

Answer (3 marks)

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

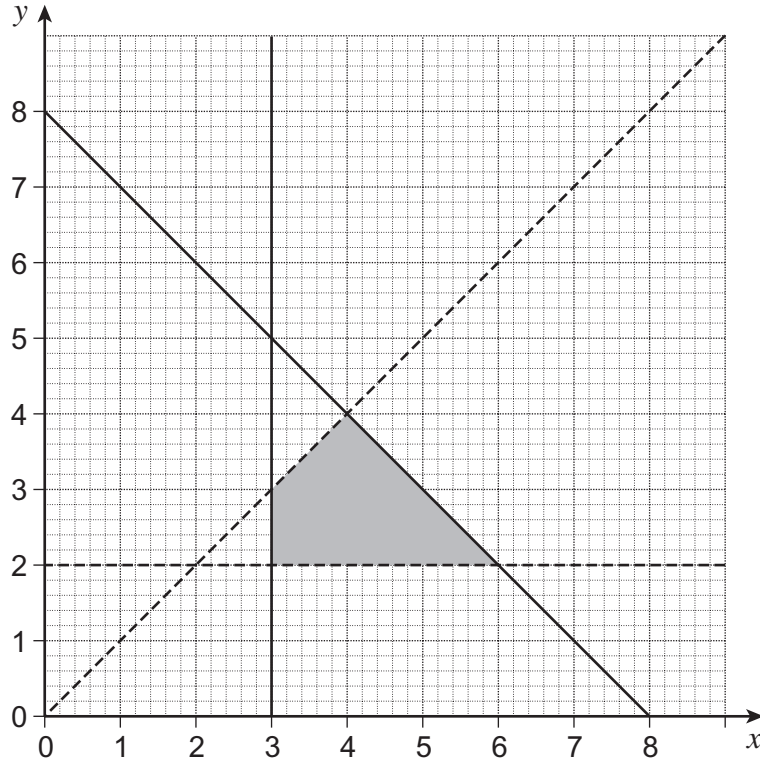
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Answer (2 marks)



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



Answer

.....

(4 marks)



16

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

$9^{\frac{1}{2}}$

$(-7)^0$

$\left(\frac{1}{8}\right)^{-\frac{1}{3}}$

.....

.....

.....

.....

.....

.....

.....

Smallest

.....

Largest

(4 marks)



There are no questions printed on this page

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

