

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
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12–13	
TOTAL	



General Certificate of Secondary Education
Higher Tier
March 2013

Mathematics

43602H

Unit 2

Monday 4 March 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 4 and 5. 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.



M A R 1 3 4 3 6 0 2 H 0 1

WMP/Mar13/43602H

43602H

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

1 The table shows the charge for taking a suitcase on a plane.

Weight of suitcase	Charge
Under 15 kg	Free
15 kg – 22 kg	£20
Over 22 kg	£20 plus £5 for each extra kilogram or part of a kilogram over 22 kg

1 (a) Work out the charge for a suitcase that weighs 24 kg.

.....

Answer £ (2 marks)

1 (b) Work out the charge for a suitcase that weighs 24.3 kg.

Answer £ (1 mark)

1 (c) Jack has two suitcases.
He pays a total charge of £70.
One suitcase weighs 21 kg.

What is the **most** the other suitcase could weigh?

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

Answer kg (3 marks)



2 Solve $8(x + 3) = 36$

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

$x =$ (3 marks)

3 Tick the correct box in each row.

	Always odd	Always even	Can be odd or even
Cube numbers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prime numbers greater than 100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Factors of odd prime numbers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(3 marks)



*4 Here are two adverts for biscuits.

Super Snacks
£3.40 per box
OFFER 40% off

Cookie Club
£3.09 per box
OFFER $\frac{1}{3}$ off

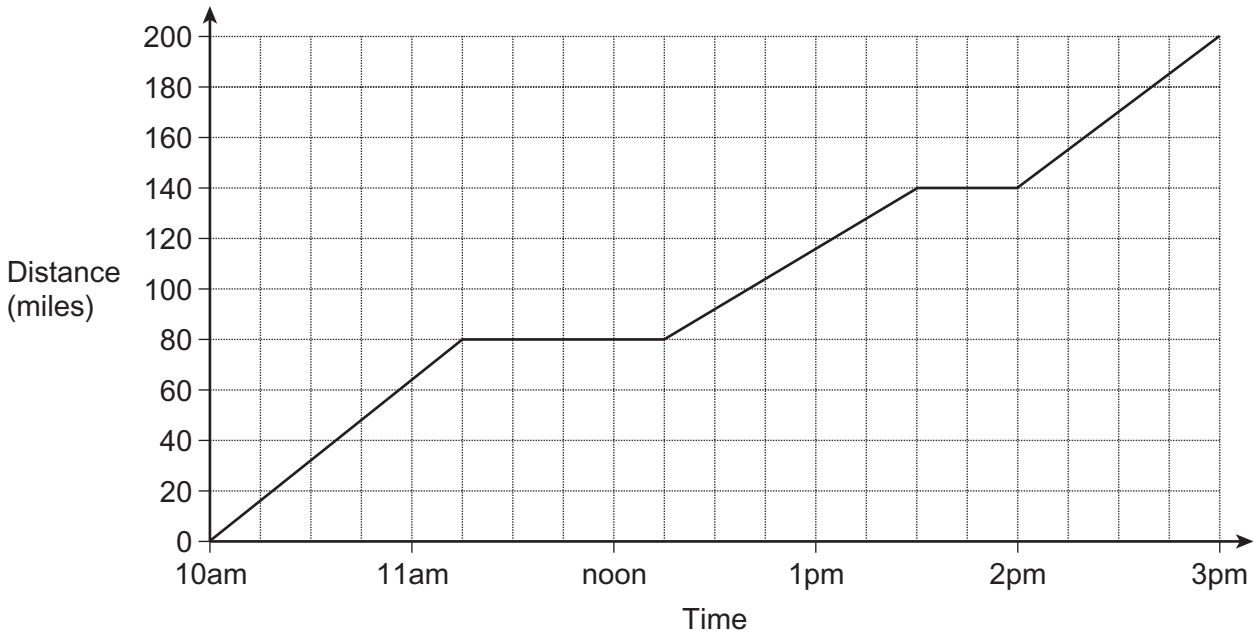
Which is cheaper, Super Snacks or Cookie Club?
You **must** show your working.

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Answer (5 marks)



*5 The distance-time graph represents a journey Alf makes.



Alf claims that he stopped for less than one-quarter of his total journey time.

Is he correct?

You **must** show your working.

.....

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(3 marks)



6 (a) $x = -3$ $y = 4$ and $z = -5$

Work out the value of $x + 2y - 3z$

.....

Answer (3 marks)

6 (b) $d = \frac{4}{5}$ $e = \frac{1}{2}$ and $f = \frac{2}{5}$

Work out the value of $d + e \times f$

.....

Answer (3 marks)

7 x is a square number.

Write down the values of x where $50 < x < 100$

Answer (2 marks)



8 (a) Simplify $a^{20} \times a^5$

Answer (1 mark)

8 (b) Simplify $\frac{a^{20}}{a^5}$

Answer (1 mark)

8 (c) Simplify $(a^{20})^5$

Answer (1 mark)

9 (a) Rearrange $f = 3g + 2$ to make g the subject.

.....
.....

Answer (2 marks)

9 (b) Multiply out $x^2(4 - x)$

.....
.....

Answer (2 marks)



10 Solve the simultaneous equations.

$$\begin{aligned} 2x + 3y &= 10 \\ 4x - y &= -1 \end{aligned}$$

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

.....

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.....

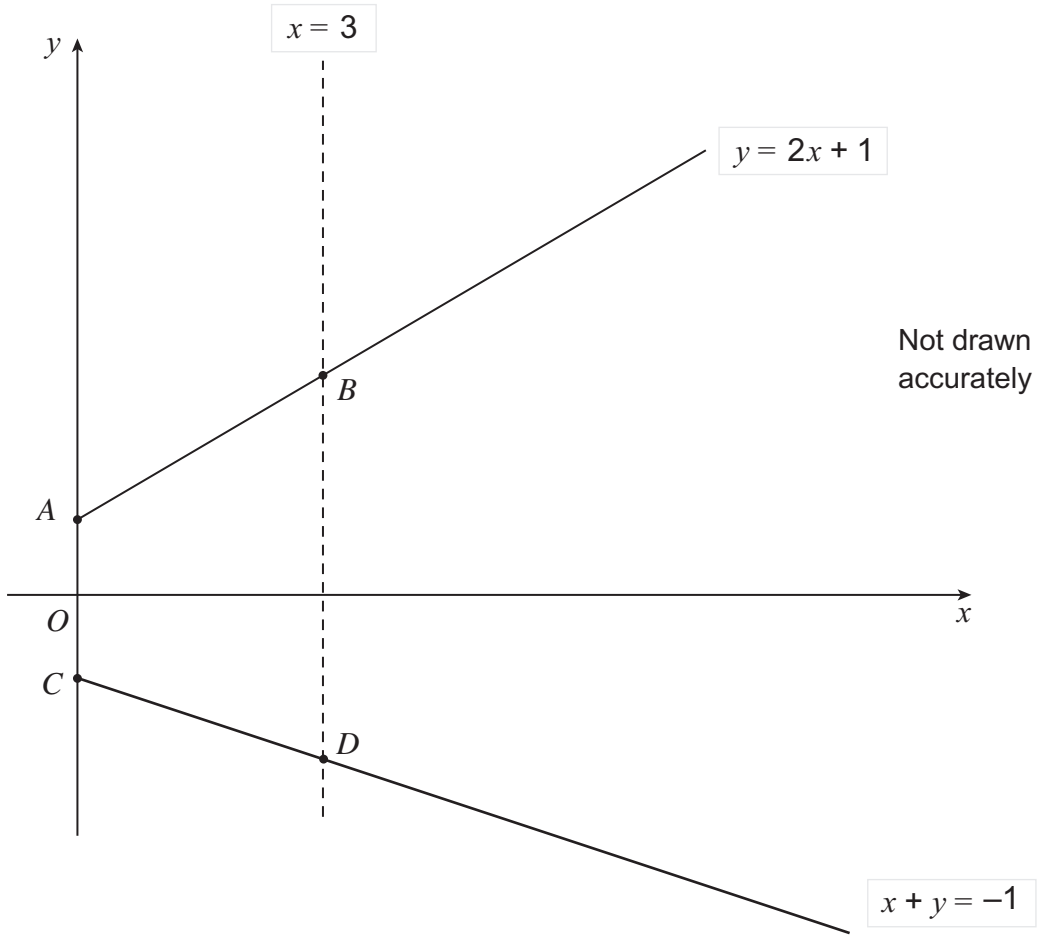
.....

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Answer (3 marks)



11



Work out the ratio of lengths $AC : BD$

.....

.....

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.....

.....

Answer :

(4 marks)

7

Turn over ►



12 (a) Factorise $x^2 + 5x - 24$

.....
.....

Answer (2 marks)

12 (b) Solve $x^2 + 5x - 24 = 0$

.....

Answer (1 mark)

13 (a) Write 0.000 72 in standard form.

Answer (1 mark)

13 (b) Divide 80 million by 20 000
Write your answer in standard form.

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

Answer (3 marks)



14 $x = 0.77$ and $y = 0.23$

Work out the value of $x^2 - y^2$

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

Answer (3 marks)

15 (a) Work out the value of $\sqrt{8} \times \sqrt{2}$

.....
.....

Answer (2 marks)

15 (b) Rationalise the denominator and simplify $\frac{12}{\sqrt{3}}$

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

Answer (2 marks)



16 Simplify fully $\frac{11}{2x} - \frac{3}{x}$

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

Answer (3 marks)

17 You are given that $(2x + 1)(ax + b) \equiv 6x^2 - 5x + c$

Work out the values of a , b and c .

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

$a = \dots\dots\dots b = \dots\dots\dots c = \dots\dots\dots$ (4 marks)



18 Find **two** sets of values for c and d such that

$$16^c = 2^d$$

.....

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.....

.....

$$c = \dots\dots\dots \text{ and } d = \dots\dots\dots$$

or $c = \dots\dots\dots \text{ and } d = \dots\dots\dots$ (3 marks)

END OF QUESTIONS

10

Turn over ►



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ANSWER IN THE SPACES PROVIDED**



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