Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2 – 3	
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14 – 15	
16	
TOTAL	

AQA

General Certificate of Secondary Education
Foundation Tier
June 2014

Mathematics

43602F

Unit 2

F

Monday 9 June 2014 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 3, 7 and 16. 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.

J U N 1 4 4 3 6 0 2 F 0 1

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

1 A bottle holds 1600ml of water.
300 ml cups are filled from the bottle.

1 (a) How many cups can be filled from the bottle?

[2 marks]

.....

.....

Answer .....

1 (b) How much water is left in the bottle?

[1 mark]

.....

.....

Answer ..... ml

2 (a) Write in figures the number thirty thousand and sixteen

[1 mark]

Answer .....

2 (b) Write in words the number 0.43

[1 mark]

Answer .....

2 (c) Write down the **value** of the digit 9 in the number 41 982

[1 mark]

Answer .....

*3

CAKES	
Large	80p each
Small	50p each

Work out the total cost of 3 large cakes and 10 small cakes.
Give your answer in pounds.

[3 marks]

.....

.....

.....

Answer £ .....

4 (a) Write down the **three** multiples of 30 between 100 and 200

[2 marks]

.....

.....

.....

Answer ....., ..., ...

4 (b) Circle the number in the list that is **not** a factor of 30

[1 mark]

2 3 5 6 8

12

5 (a) Circle the **two** numbers that add up to 100

[1 mark]

21 34 35 65 76

5 (b) Circle the **two** numbers that are even.

[1 mark]

21 34 35 65 76

5 (c) The number 31 is 5 less than the square number 36

Circle the number that is 5 **less** than a square number.

[1 mark]

21 34 35 65 76

5 (d) Circle the number that is 5 **more** than a square number.

[1 mark]

21 34 35 65 76

6 Here are the first three lines of a number pattern.

Line 1 $2 \times 2 - 2 \times 1^2 = 2$

Line 2 $4 \times 3 - 2 \times 2^2 = 4$

Line 3 $6 \times 4 - 2 \times 3^2 = 6$

6 (a) Write down Line 4 of the pattern.

[2 marks]

Line 4 ..... = ...

6 (b) Which line of the pattern is this?

[1 mark]

Line ..... $38 \times 20 - 2 \times 19^2 = 38$

6 (c) Line n $2n(n + 1) - 2n^2 = 2n$

Show how $2n(n + 1) - 2n^2$ simplifies to $2n$

[1 mark]

.....

.....

.....

8

***7** Four friends **each** save £25 every month for one year.

They see this advert for a holiday.

HOLIDAY for 4 people

Usually £2600

Now HALF PRICE!

Is the total saved enough to buy this holiday?
You **must** show your working.

[5 marks]

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.....

8 Put these in order starting with the smallest value.

$\frac{13}{4}$ $3\frac{1}{2}$ 3.15 $\sqrt{9}$

You **must** show your working.

[3 marks]

.....

.....

.....

.....

.....

Smallest .....

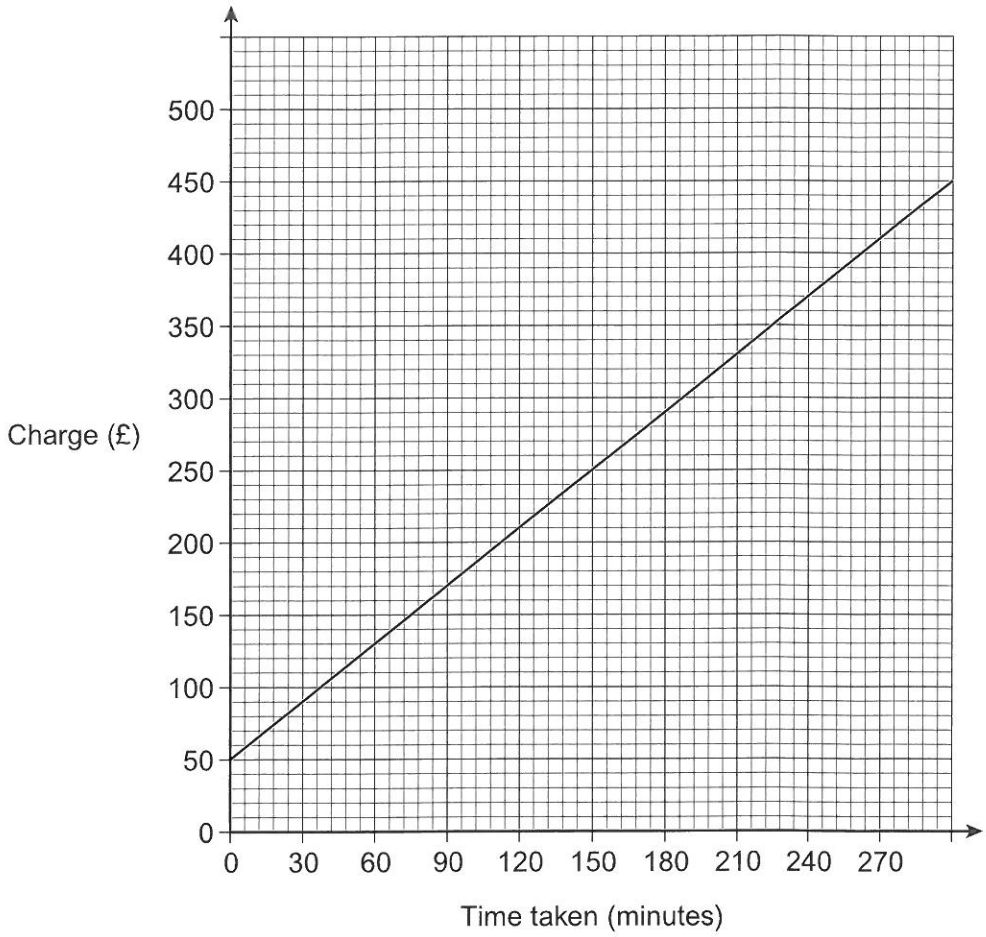
.....

.....

Largest .....

8

9 Law firm *A* uses this graph to work out charges.



9 (a) How much does Law firm *A* charge for 30 minutes?

[1 mark]

Answer £ .....

9 (b) Law firm *A* charges a customer £370

How many minutes is this for?

[1 mark]

Answer ..... minutes

9 (c) Law firm *B* charges

£150 for up to 90 minutes

plus £50 for every extra 30 minutes.

Which law firm is cheaper, and by how much, for 270 minutes?

[3 marks]

.....

.....

.....

Law Firm ..... is cheaper by £ .....

5

10 Nick buys four oranges.
He pays with a £2 coin.

He is given three coins in change.
The three coins all have the **same** value.

Work out the cost of **one** orange.

[4 marks]

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Answer ..... pence

11 $c = \frac{1}{2}$ $d = \frac{1}{3}$

Work out the value of cd

[2 marks]

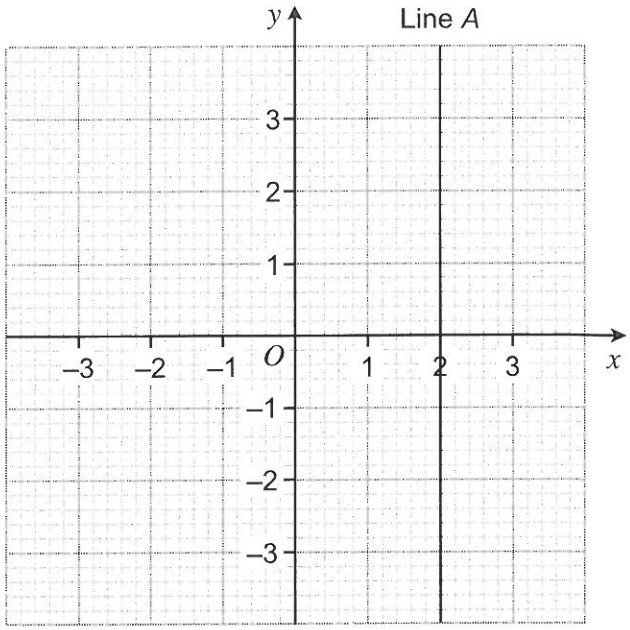
.....

.....

.....

Answer .....

14



14 (a) Circle the equation of line *A*.

[1 mark]

$y = 2$ $x = 2$ $x + y = 2$ $y = x + 2$

14 (b) On the grid draw the line $y = x$

[1 mark]

14 (c) Write down the coordinates of the point where the line $y = x$ crosses line *A*.

[1 mark]

Answer (..... , ...)

12 Solve $8x - 10 = 30$

[2 marks]

.....

.....

$x =$ .....

13 Put the correct symbol in each box.

Choose from $<$ $>$ $=$

[3 marks]

11×12 ☐ 22×6

3^2 ☐ 2^3

$\frac{10}{0.5}$ ☐ 10

11

15 2476 adults watch a cricket match.

The ratio men : women is 3 : 1

How many **more** men than women watch the match?

[3 marks]

.....

.....

.....

.....

.....

Answer .....

Turn over for the next question

6

***16** Here are three offers for a computer.

Tablet World	**IT Supplies**	**PC Heaven**
Usual price £170	Usual price £180	Special offer
20% off	$\frac{1}{4}$ off	Pay £23 each month for 6 months

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

[6 marks]

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.....

Answer .....

17 (a) Simplify fully $4a - 3a + 2b - 8b$

[2 marks]

.....

.....

.....

Answer .....

17 (b) Factorise $m^2 - 2m$

[1 mark]

Answer .....

17 (c) Multiply out $5x(x - 3)$

[2 marks]

.....

Answer .....

18 I am thinking of a number.

My number is between 20 and 30
My number and 12 have only one common factor.

What number could I be thinking of?
Give all **three** possible answers.

[2 marks]

.....

.....

.....

Answer ..... , ... , ...

13

19 Two positive fractions add up to $\frac{1}{3}$

Each fraction has a **different** value.

What could the fractions be?
Give **one** possible answer.

[3 marks]

.....

.....

.....

Answer ..... + ... = $\frac{1}{3}$

END OF QUESTIONS

3

AQA Qualifications

GCSE

Mathematics

Unit 2 43602F

Mark scheme

43602F

June 2014

Version/Stage: V1.0 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available from aqa.org.uk

Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

M	Method marks are awarded for a correct method which could lead to a correct answer.
M dep	A method mark dependent on a previous method mark being awarded.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
ft	Follow through marks. Marks awarded following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
oe	Or equivalent. Accept answers that are equivalent. eg, accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a candidate has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the candidate. In cases where there is no doubt that the answer has come from incorrect working then the candidate should be penalised.

Questions which ask candidates to show working

Instructions on marking will be given but usually marks are not awarded to candidates who show no working.

Questions which do not ask candidates to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Candidates often copy values from a question incorrectly. If the examiner thinks that the candidate has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Q	Answer	Mark	Comments
1(a)	1600 ÷ 300 or 5.(…) or 300 × 5 or 1500 or 300, 600, 900, 1200, 1500 or 1600, 1300, 1000, 700, 400, 100	M1	oe oe mixed number oe allow one error in adding or subtracting 300
	5	A1	
1(b)	100	B1ft	ft only for answer in part (a) **not 5** and correct evaluation of 1600 – their 1500 from part (a) if 1300 < their 1500 ≤ 1600
2(a)	30 016	B1	condone 30,016 or 30'016
2(b)	zero point four three or nought point four three or point four three or forty three hundredths	B1	
2(c)	(nine) hundred(s) or 900 or 100(s)	B1	

Q	Answer	Mark	Comments
3	3 × 80 or 240 or 3 × 0.8(0) or 2.4(0)	M1	oe
	10 × 50 or 500 or 10 × 0.5(0) or 5(.00)	M1	oe
	7.40	Q1ft	Strand (i) correct money notation ft only if M1M0 or M0M1 awarded and a correct total of two amounts given in money notation as a multiple of 10p
4(a)	120, 150 and 180 with none incorrect	B2	any order B1 Two correct multiples in range with at most one incorrect or all three correct with any other multiples of 30 or another group of exactly three multiples of 30
4(b)	8	B1	
5(a)	35 and 65	B1	
5(b)	34 and 76	B1	
5(c)	76	B1	
5(d)	21	B1	

Q	Answer	Mark	Comments
6(a)	$8 \times 5 - 2 \times 4^2$ (=) 8	B2	B1 $8 \times 5 - 2 \times 4^2$ or 8
6(b)	19	B1	
6(c)	$2n^2 + 2n - 2n^2$ or $2n(n + 1 - n)$	B1	

Q	Answer	Mark	Comments
7	**Alternative method 1**		
	25 × 4 or 100 or 25 × 12 or 300	M1	oe
	their 100 × 12 or their 300 × 4 or 1200	M1	oe
	2600 ÷ 2 or 1300	M1	oe
	1200 and 1300	A1	
	No and 1200 and 1300	Q1ft	Strand (iii) at least M2 scored and correct decision for their values
	Alternative method 2		
	2600 ÷ 2 or 1300 or 2600 ÷ 4 or 650	M1	oe
	their 1300 ÷ 4 or their 650 ÷ 2 or 325	M1	oe
	25 × 12 or 300	M1	oe
	300 and 325	A1	
	No and 300 and 325	Q1ft	Strand (iii) at least M2 scored and correct decision for their values
	Alternative method 3 and 4 (next page)		

Q	Answer	Mark	Comments
Q7 continued	**Alternative method 3**		
	2600 ÷ 2 or 1300 or 2600 ÷ 4 or 650	M1	oe
	their 1300 ÷ 4 or their 650 ÷ 2 or 325	M1	oe
	their 325 ÷ 12	M1	oe
	27.(…)	A1	
	No and 27.(…)	Q1ft	Strand (iii) at least M2 scored and correct decision for their 27.(…)
	Alternative method 4		
	2 × 25 or 50 or 4 × 25 or 100	M1	oe
	their 50 × 4 or their 100 × 2 or 200	M1	oe
	their 200 × 12 or 8 × 25 × 12	M1	oe
	2400	A1	
	No and 2400	Q1ft	Strand (iii) at least M2 scored and correct decision for their 2400

Q	Answer	Mark	Comments
8	Correct order **and** all four correct values seen in same format 3, 3.15, 3.25, 3.5(0) or 3, $3\frac{15}{100}$, $3\frac{25}{100}$, $3\frac{50}{100}$ or 3, $3\frac{3}{20}$, $3\frac{1}{4}$, $3\frac{1}{2}$ or 300(%), 315(%), 325(%), 350(%) or $\sqrt{9}$, 3.15, $\frac{13}{4}$, $3\frac{1}{2}$ after values seen in same format	B3	oe B2 all four correct values in same format or three correct values in same format and correct order for their values B1 three correct values in same format SC1 $\sqrt{9}$, 3.15, $\frac{13}{4}$, $3\frac{1}{2}$ with no working
9(a)	90	B1	
9(b)	240	B1	

Q	Answer	Mark	Comments
9(c)	**Alternative method 1**		
	410	B1	
	150 + 6 × 50 or 450	M1	oe 450 – 410 is B1M1
	A and 40	A1ft	ft their 410 (value indicated for law firm A) A and 40 is B1M1A1
	Alternative method 2		
	410	B1	
	Line from (90, 150) to (270, 450)	M1	
	A and 40	A1ft	ft their 410 (value indicated for law firm A) A and 40 is B1M1A1
10	3 × coin value or 3(p) or 6(p) or 15(p) or 30(p) or 60(p) or 150(p) or (£)1.50	M1	coin value = 1p, 2p, 5p, 10p, 20p, 50p
	(£) 2.(00) – their 3 × coin value or 197(p) or 194(p) or 185(p) or 170(p) or 140(p) or 50(p)	M1	oe in pounds
	their (200 – their 3 × coin value) ÷ 4	M1 dep	dependent on second M1
	35 or 49.25 or 48.5 or 46.25 or 42.5 or 12.5	A1	ignore truncation or rounding after correct value seen SC1 any correct trial: chooses cost of one orange and works out change for four oranges
11	$\frac{1}{2} \times \frac{1}{3}$	M1	oe
	$\frac{1}{6}$	A1	oe

Q	Answer	Mark	Comments
12	**Alternative method 1**		
	$(8x =)$ 30 + 10 or $(8x =)$ 40	M1	
	5	A1	SC1 2.5 or $\frac{20}{8}$ oe
	Alternative method 2		
	$x - \frac{10}{8} = \frac{30}{8}$ or $x = \frac{30}{8} + \frac{10}{8}$ or their (30 + 10) ÷ 8	M1	
	5	A1	SC1 2.5 or $\frac{20}{8}$ oe
13	= > >	B1 B1 B1	
14(a)	$x = 2$	B1	
14(b)	Correct straight line drawn	B1	at least 3 diagonal squares long
14(c)	2, 2	B1ft	ft their intersection with line A only if B0 in part (b)

Q	Answer	Mark	Comments
15	**Alternative method 1**		
	2476 ÷ (3 + 1) or 619	M1	oe
	their 619 × (3 – 1) or their 619 × 2 or 2476 ÷ (3 – 1) or 2476 ÷ 2 or their 619 × 3 – their 619 or (2476 – their 619) – their 619 or 1857 – 619	M1	oe
	1238	A1	
	Alternative method 2		
	(3 + 1) ÷ (3 – 1) or 4 ÷ 2 or (3 – 1) ÷ (3 + 1) or 2 ÷ 4	M1	oe
	2476 ÷ their 2 or 2476 × their $\frac{1}{2}$	M1	oe
	1238	A1	

Q	Answer	Mark	Comments
16	$\frac{170}{100}\times 20$ or $\frac{170}{10}\times 2$ or 17×2 or 34 or $\frac{170}{100}\times 80$ or $\frac{170}{10}\times 8$	M1	oe (Tablet World)
	136	A1	
	$180\div 4$ or 45 or $180\times\frac{3}{4}$	M1	oe (IT Supplies)
	135	A1	
	138	B1	(PC Heaven)
	IT Supplies	Q1ft	Strand (iii) ft for correct decision based on their values, must have both method marks and a total for PC Heaven
17(a)	$a-6b$ or $-6b+a$	B2	B1 (1)a or – 6b
17(b)	$m(m-2)$ or $m\times(m-2)$ or $(m-2)m$ or $(m-2)\times m$	B1	
17(c)	$5x^2-15x$ or $-15x+5x^2$	B2	B1 $5x^2$ or $-15x$

Q	Answer	Mark	Comments
18	23, 25 and 29	B2	any order B1 three correct and one incorrect or two correct and none or one incorrect SC1 any three or all four of 21, 22, 26 and 27 with no other number
19	A correct pair of fractions meeting all conditions eg $\frac{1}{9}$ and $\frac{2}{9}$ or $\frac{1}{12}$ and $\frac{1}{4}$	B3	B2 a pair of fractions which add to $\frac{1}{3}$ but which do not satisfy all conditions eg, $\frac{1}{6}$ and $\frac{1}{6}$ or $\frac{2}{3}$ and $-\frac{1}{3}$ or $\frac{1}{3}$ – any fraction less than $\frac{1}{3}$ correctly changed to common denominator with at least one numerator correct B1 $\frac{1}{3}$ changed to any equivalent fraction $\frac{2}{6}, \frac{3}{9}, \frac{4}{12}, \ldots$ or $\frac{1}{3}$ – any fraction less than $\frac{1}{3}$