



**General Certificate of Secondary Education  
June 2013**

**Mathematics**

**43602F**

**Unit 2 Foundation tier**

**Final**

***Mark Scheme***

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## 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.

<b>M</b>	Method marks are awarded for a correct method which could lead to a correct answer.
<b>A</b>	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>B</b>	Marks awarded independent of method.
<b>Q</b>	Marks awarded for Quality of Written Communication
<b>ft</b>	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
<b>SC</b>	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
<b>M dep</b>	A method mark dependent on a previous method mark being awarded.
<b>B dep</b>	A mark that can only be awarded if a previous independent mark has been awarded.
<b>oe</b>	Or equivalent. Accept answers that are equivalent. eg, accept 0.5 as well as $\frac{1}{2}$
<b>[<i>a</i>, <i>b</i>]</b>	Accept values between <i>a</i> and <i>b</i> inclusive.
<b>3.14...</b>	Allow answers which begin 3.14 eg 3.14, 3.142, 3.149.
<b>Use of brackets</b>	It is not necessary to see the bracketed work to award the marks.

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
1a	37 and 65	B1	Any indication
1b	58	B1	
2	30	B1	
	37	B1 ft	ft their 30 + 7
3a	(2, 4)	B1	
3b	Point B plotted at (-3, -1)	B1	
3c	(2, -1)	B1 ft	ft from their (a)
4a	20 (p)	B1	Accept £0.20(p)
4b	10 × (25 – their 20) or 10 × 25 – 10 × their 20	M1	oe ft their 20 from (a) if < 25
	50 (p)	A1 ft	Accept £0.50(p)
5	10 or 40 used as an approximation	M1	
	400 or 410	A1	
6a	$2 \times 2(.00) + 1.25$	M1	oe
	5.25	A1	
6b	10 – their 5.25	M1	
	4.75	A1 ft	ft their 5.25
7	Valid reason	B1	eg (23) is odd or prime or not an even number or not a multiple of 4
	Valid reason	B1	eg (36) is the only multiple of 6 or only square number
	Valid reason	B1	eg (40) is the only multiple of 10 or only one in 5 times table




Q	Answer	Mark	Comments
8a	$5 \times 8$	M1	oe
	40.(00)	A1	
8b	$96 \div 8$	M1	oe
	12	A1	
9	$100 - (27 + 41)$	M1	oe
	32	A1	
	Correct minimum numbers for their 32  $R = 14, B = 0, G = 9$ scores 4 marks	B2ft	ft from their 32 B1 buys beads to make each number of each colour equal or two correct minimum numbers for their 32 SC2 $R = 14$ and $B = 0$ SC1 $R = 14$
10a	3.6	B1	
10b	0.325 0.5 0.62	B1	
10c	$\frac{4}{5}$ and 80%	B2	B1 for one correct (and one incorrect) or for two correct and one incorrect Any indication
11	Correct set of 3 numbers eg $-2, 2$ and $3$ or $-1, 1$ and $12$ or $-\frac{1}{2}, \frac{1}{2}$ and $48$	B2	B1 for 3 numbers with a product of $-12$ , or 3 numbers, two of which have a sum of 0, including at most 1 zero

Q	Answer	Mark	Comments	
12	$600 \div 4 (= 150)$	M1	oe	
	$\frac{40}{100} \times 600 (= 240)$	M1	oe	
	their 150 + their 240 (= 390)	M1	600 – their 150 (= 450) or 600 – their 240 (= 360)	
	600 – their 390	M1	their 450 – their 240 or their 360 – their 150	
	210	A1		
	<b>Alternative method 1</b>			
	25(%)	M1	0.25	
	their 25(%) + 40(%) (= 65(%)	M1	their 0.25 + 0.4(0) (= 0.65)	
	100(%) – their 65(%) (= 35(%)	M1	1 – their 0.65 (= 0.35)	
	$\frac{\text{their } 35(\%)}{100} \times 600$	M1	oe 0.35 × 600	
	210	A1		
	<b>Alternative method 2</b>			
$\frac{2}{5}$ or $\frac{40}{100}$	M1	oe		
their $\frac{5}{20}$ + their $\frac{8}{20}$	M1	oe makes common denominators with at least 1 correct numerator		
$1 - (\text{their } \frac{5}{20} + \text{their } \frac{8}{20}) (= \frac{7}{20})$	M1dep			
their $\frac{7}{20} \times 600$	M1	oe		
210	A1			

Q	Answer	Mark	Comments
13a	$\frac{1}{12}$	B1	oe eg $\frac{12}{144}$
13b	$(\frac{1}{4} \text{ and}) \frac{2}{4}$ or $\frac{2}{8} \text{ and } \frac{4}{8}$ or 25(%) and 50(%) or 0.25 and 0.5	M1	oe into equivalent form fractions with common denominator or percentages or decimals
	$\frac{1.5}{4}$	A1	oe eg $\frac{37.5}{100}$ or 37.5% or 0.375
	$\frac{3}{8}$	Q1	oe fraction Strand (ii)
	<b>Alternative method</b>		
	$\frac{1}{4} + \frac{1}{2} (= \frac{3}{4})$	M1	
	$\frac{3}{4} \times \frac{1}{2}$	A1	oe
	$\frac{3}{8}$	Q1	oe fraction Strand (ii)
14a	$3 \times 5 (-) 4 \times \frac{1}{2}$ or 15 (-) 2	M1	oe
	13	A1	
14b	$6x + 12$ or $2x + 2$	M1	
	$6x + 12 + 2x + 2$	A1	
	$8x + 14$	A1ft	oe ft from their 4 terms



Q	Answer	Mark	Comments
15a	$x + 5$ or $5 + x$	B1	
15b	$x (+) x + 5 (+) x + 10 (+) x + 15 (=54)$	B1	oe eg $4x + 30$
	their $4x +$ their $30 = 54$	M1	collecting their four or more different algebraic expressions and equating
	their $4x =$ their $24$	M1	$54 -$ their $30$ correctly evaluated from $ax + b = 54$ with $a > 1$
	6	A1	SC2 6 on answer line with no correct algebraic working
16a	27 or 16	M1	
	43	A1	
16b	$(5^3 =) 125$ or $(10^2 =) 100$	M1	
	125 and 100	A1	
	$5^2$	A1	25 without working implies M1A1

Q	Answer	Mark	Comments	
17	1 (+) 2 (+) 6 (= 9)	M1	oe eg $a (+) 2a (+) 6a (= 9a)$	
	180 ÷ their 9 (= 20)	M1	oe $a = 180 \div 9 (= 20)$	
	6 × their 20	M1		
	120	A1		
	120 and Yes	Q1	Strand (iii) M3 awarded and a correct decision based on their 120 SC3 30, 60 and 90 with 90 and No SC2 30, 60 and 90	
	<b>Alternative method using T &amp; I</b>			
	ratio 1:2:6 seen or implied in any order	M1		
	Correctly evaluated trial	M1	eg $10 + 20 + 60 = 90$	
	2 <sup>nd</sup> trial in ratio 1:2:6 correctly evaluated	M1	eg $15 + 30 + 90 = 135$	
	120	A1		
120 and Yes	Q1	Strand (iii) M3 awarded and a correct decision based on their 120 SC3 30, 60 and 90 with 90 and No SC2 30, 60 and 90		
18a	$4x \leq 13 + 7$ or $x - \frac{7}{4} \leq \frac{13}{4}$	M1	oe	
	$x \leq 5$	A1	SC1 $x < 5$ or $x = 5$ or $x \geq 5$	
18b		B2	B1 for  or  or 