

# Mark Scheme (Results)

March 2013

GCSE Mathematics (Linear) 1MA0  
Foundation (Non-Calculator) Paper 1F

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March 2013

Publications Code UG035041

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## NOTES ON MARKING PRINCIPLES

- 1** All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- 2** Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- 3** All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- 4** Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- 5** Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- 6** Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:
  - i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*  
Comprehension and meaning is clear by using correct notation and labelling conventions.
  - ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*  
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.
  - iii) *organise information clearly and coherently, using specialist vocabulary when appropriate.*  
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

## **7 With working**

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

## **8 Follow through marks**

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

## **9 Ignoring subsequent work**

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect cancelling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

**10 Probability**

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

**11 Linear equations**

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

**12 Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

### 13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

#### Guidance on the use of codes within this mark scheme

M1 – method mark

A1 – accuracy mark

B1 – Working mark

C1 – communication mark

QWC – quality of written communication

oe – or equivalent

cao – correct answer only


ft – follow through

sc – special case

dep – dependent (on a previous mark or conclusion)

indep – independent

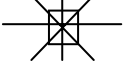
isw – ignore subsequent working

1MA0_1F					
Question		Working	Answer	Mark	Notes
1	(a)		8	1	B1 cao
	(b)		11	1	B1 cao
	(c)		$2\frac{1}{4}$ circles	1	B1 for $2\frac{1}{4}$ circles oe
2	(a)		Arrows on correct lines	1	B1 Arrows on correct lines with no extras marked
	(b)		8	1	B1 for $8 \pm 0.2$
	(c)		acute	1	B1 cao
	(d)		124	1	B1 for $124 \pm 2$
3	(a)		98 145 358 709 835	1	B1 cao
	(b)		-8 -5 -1 4 7	1	B1 cao
	(c)	(0.2, 0.25, 0.4, 0.5, 0.75) ( $\frac{4}{20}, \frac{5}{20}, \frac{8}{20}, \frac{10}{20}, \frac{15}{20}$ ) (20%, 25%, 40%, 50%, 75%)	0.2 $\frac{1}{4}$ 40% 0.5 $\frac{3}{4}$	2	M1 for two correct conversions into the same form A1 cao  If no method seen SCB1 for correct numbers in the reverse order

1MA0_1F					
Question		Working	Answer	Mark	Notes
4	(a)		Cross at $\frac{1}{2}$	1	B1 for cross (×) within overlay
	(b)		Cross at 0	1	B1 for cross (×) within overlay
	(c)(i)		H1 H2 H3 H4 H5 H6 T1 T2 T3 T4 T5 T6		M1 for evidence of attempting combinations eg at least 5 correct A1 for all 12, no extras or repeats (Can repeat H1)
	(ii)		$\frac{3}{12}$	4	M1 ft for evidence of correct numerator or denominator In a fraction less than 1 A1 ft from (i) Note probability must written as a percentage, decimal or fraction



1MA0_1F				
Question	Working	Answer	Mark	Notes
*5		20p	5	<p>M1 for a method to find the price of the apples  M1 for a method to find or use the price of 3 oranges ie <math>3 \times 30</math> OR  -30-30-30  M1 for a method to combine the costs of 'their fruit' <b>or</b> for a method to total the coins  M1 (dep on at least M1 from the first M2 scored) for a method to find the difference between 'their total of the coins' and the price of both 'their fruits'.  Could be 'total' - 'total' or coins - 'total' or coins - individual prices.  It must be physically possible.  C1 (dep on M1) for £0.20 or 20p and valid working</p> <p>OR</p> <p>M1 for a method to find the price of the apples  M1 for a method to find or use the price of 3 oranges ie <math>3 \times 30</math> OR  -30-30-30  M1 for a method to select coins that equate to 'their total' for one fruit  M1 (dep on at least M1 from the first M2 scored) for a method to select coins that equate to 'their total' for both fruits  C1 (dep on M1) for £0.20 or 20p and valid working</p> <p>SC B1 £0.20 or 20p as the answer , no working shown</p>

1MA0_1F					
Question		Working	Answer	Mark	Notes
6	(a)			2	M1 for any 1 correct line of symmetry allow extras A1 for all 4 lines and no extras
	(b)		2	1	B1 cao
	(c)		70	2	M1 for $7 \times 10$ A1 for 70
7	(a)		4	1	B1 cao
	(b)		13	1	B1 cao
	(c)		11 and 14	1	B1 cao
	(d)		4	2	M1 for 14-10 or 10-14 or -4 or 10 to 14 or 14 to 10 A1 cao
	(e)	$4 + 3 + 2 + 5 + 3$	17	2	M1 for adding at least 4 correct heights out of 4 or 5 heights A1 cao

1MA0_1F				
Question	Working	Answer	Mark	Notes
*8	(a)	20 45	1	B1
	(b)	No	3	M1 for doubling Seeta's time or halving Ninal's time or finding the difference between the two times Eg 3 min 45 sec $\times 2$ or $(7m 28s) \div 2$ or 7m 28s-3min 45 secs M1 for a complete method to convert their time(s) to common units with the units stated C1 for No and <b>correct</b> figures compared (could be in secs or mins and secs)
9	(a)	$4a$	1	B1 for $4a$ oe as a single term
	(b)	$3cd$	1	B1 for $3cd$ oe as a single term
	(c)	$7ef$	1	B1 for $7ef$ oe as a single term
	(d)	3	1	B1 cao
	(e)	2	2	M1 for intention to subtract 7 from each side or divide each term by 5 or embedded method A1 cao

1MA0_1F				
Question	Working	Answer	Mark	Notes
10	(a)	parallelogram	1	B1 Allow trapezium
	(b)	isosceles	1	B1
	(c)	6	2	M1 for a complete method to find the area A1 cao  Note: For dots to be a valid method candidates must give an answer in the range 5 to 7
11	(a)(i)	( 4, 3 )	2	B1 cao
	(ii)	( -4, -1 )		B1 cao
	(b)	( 0, 1 )	2	M1 for ( 0, 1 ) marked on the graph or ( 0, y ) or ( x, 1 ) A1 cao
12	(a)	reflection	2	B2 for correct reflection in correct position (B1 for at least 2 vertices in the correct position)
	(b)	enlargement	2	B2 for correct enlargement scale factor 3 (B1 for at least 2 lines correctly enlarged or any enlargement using an incorrect scale factor, $sf \neq 1$ )
	(c)	105	2	M1 for $360 - ( 90 + 128 + 37 )$ oe or $x + 90 + 128 + 37 = 360$ A1 cao

1MA0_1F				
Question	Working	Answer	Mark	Notes
13	(a)	32	2	M1 for $4 \times 5 + 12$ oe A1 cao
	(b)	7	3	M1 for $40 - 12$ or 28 seen M1 (dep) for $'28' \div 4$ A1 cao  OR M1 for $12 + 4 + 4 + \dots$ M1 for $12 + 7 \times 4$ oe A1 cao  OR M1 for $12 + 4x = 40$ oe M1 for $4x = 40 - 12$ oe A1 cao NOTE: A correct embedded answer scores M2 A0  OR M1 ft for $'32' + 4\dots$ or $40 - '32'$ M1 ft for $5 + 1 \dots$ oe A1 ft  Note: Do not follow through from part a an answer of 40

1MA0_1F					
Question		Working	Answer	Mark	Notes
14	(a)		8	1	B1 for 8 (.00)
	(b)		550	4	<p>M1 for <math>600 - 200 (= 400)</math>  M1 for correct method to convert '\$400' to £  M1 (dep on the previous M1) for <math>800 - '400'</math> in £s  A1 for value in the range 540 –560</p> <p>OR</p> <p>M1 for correct method to convert \$600 <b>and</b> \$200 to pounds  M1 for '375'–'125'  M1 (dep on the previous M1) <math>800 - '250'</math>  A1 for a value in the range 540-560</p> <p>OR</p> <p>M1 for correct method to convert £800 to dollars  M1 for '<math>1280' + 200 - 600</math>  M1 (dep on the previous M1) for attempt to convert '\$880' back to £  A1 for value in the range 540 – 560</p>
15			3 primes that total 20	3	<p>M1 for identifying at least 2 different prime numbers from the list, could indicate on the list (not more than one incorrect)  M1 for any 3 numbers from the list that total 20  A1 for 2, 7, 11 or 2, 5, 13 or both (in any order)</p>

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Question	Working		Answer	Mark	Notes															
16			09 36	3	<p>M1 for listing 9, 18, 27, 36, 45, ... (at least 3 correct multiples with at most one incorrect)</p> <p>M1 for listing 12, 24, 36, 48, .... (at least 3 correct multiples with at most one incorrect)</p> <p>A1 for 09 36 or 9 36(am)</p> <p>OR</p> <p>M1 for listing 9.09 9.18 9.27 9.36 ... (at least 3 correct times with at most one incorrect)</p> <p>M1 for listing 9.12 9.24 9.36 ... (at least 3 correct times with at most one incorrect)</p> <p>A1 for 09 36 or 9 36(am)</p> <p>OR</p> <p>M1 for <math>9 = 3 \times 3</math> <b>or</b> <math>12 = 2 \times 2 \times 3</math> (could be in a factor tree)</p> <p>M1 for <math>9 = 3 \times 3</math> <b>and</b> <math>12 = 2 \times 2 \times 3</math> (could be in a factor tree)</p> <p>A1 for 09 36 or 9 36(am)</p> <p>SC B2 9 36pm or (after) 36 (minutes) on the answer line</p>															
17		<table border="1"> <thead> <tr> <th>Colour</th> <th>Tally</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>Red</td> <td></td> <td></td> </tr> <tr> <td>Blue</td> <td></td> <td></td> </tr> <tr> <td>Green</td> <td></td> <td></td> </tr> <tr> <td>Silver</td> <td></td> <td></td> </tr> </tbody> </table>	Colour	Tally	Frequency	Red			Blue			Green			Silver			Data collection table	3	<p>B3 for correct table with all three aspects without repeats</p> <p>Aspect 1: colour (of car) or for at least 3 of red, blue, green, other etc.</p> <p>Aspect 2: 'tally' or tally marks or 'frequency' or 'number of cars'</p> <p>Aspect 3: 'frequency' or 'total(s)' or 'number of cars'</p> <p>(B2 for two aspects)</p> <p>(B1 for one aspect)</p>
Colour	Tally	Frequency																		
Red																				
Blue																				
Green																				
Silver																				

1MA0_1F				
Question	Working	Answer	Mark	Notes
*18		35° with reasons	4	<p>M1 for correct method to find one angle eg 70 or 110 (angles could be on the diagram)</p> <p>M1 for a complete correct method to work out <math>x</math></p> <p>A1 (dep on M1) for 35°</p> <p>C1 for complete geometric reasons for their chosen method without extras eg</p> <p><u>exterior angle = sum of interior opposite angles</u>  <u>and base angles of an isosceles triangle are equal</u></p> <p>OR</p> <p><u>angles in a triangle add up to 180 and angles on a straight line add up to 180 and base angles of an isosceles triangle are equal</u></p> <p>OR</p> <p>M1 <math>x + x + 20 + 90 = 180</math></p> <p>M1 for a complete correct method to work out <math>x</math></p> <p>A1 (dep on M1) for 35°</p> <p>C1 for complete geometric reasons for their chosen method without extras eg</p> <p><u>angles in a triangle add up to 180 and base angles of an isosceles triangle are equal</u></p>



1MA0\_1F

Question	Working	Answer	Mark	Notes																																				
19	$\begin{array}{r} 183 \\ \times 47 \\ \hline 1281 \\ 7320 \\ \hline 8601 \end{array}$ <table border="1" data-bbox="450 544 792 798"> <tr> <td></td> <td>1</td> <td>8</td> <td>3</td> <td>×</td> <td></td> </tr> <tr> <td></td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>4</td> </tr> <tr> <td>8</td> <td>7</td> <td>5</td> <td>6</td> <td>2</td> <td>1</td> </tr> <tr> <td></td> <td>6</td> <td>0</td> <td>1</td> <td></td> <td></td> </tr> </table> <table border="1" data-bbox="434 890 772 1005"> <tr> <td>100</td> <td>80</td> <td>3</td> <td></td> </tr> <tr> <td>4000</td> <td>3200</td> <td>120</td> <td>40</td> </tr> <tr> <td>700</td> <td>560</td> <td>21</td> <td>7</td> </tr> </table> $4000 + 3200 + 120 + 700 + 560 + 21 = 8601$		1	8	3	×			4	3	2	1	4	8	7	5	6	2	1		6	0	1			100	80	3		4000	3200	120	40	700	560	21	7	86.01	3	<p>M1 for a complete method to multiply 183 by 47 (condone one multiplication error)</p> <p>A1 for digits 8601 given as the answer</p> <p>B1 (dep on M1) for correctly writing their answer to 2 decimal places</p>
	1	8	3	×																																				
	4	3	2	1	4																																			
8	7	5	6	2	1																																			
	6	0	1																																					
100	80	3																																						
4000	3200	120	40																																					
700	560	21	7																																					

1MA0_1F					
Question		Working	Answer	Mark	Notes
20	(a)		2 reasons	2	B2 for 2 different reasons from given examples (B1 for 1 reason from given examples) eg No time frame eg No box for less than £10 accept no box for zero or none or £0 eg Overlapping intervals or boxes or £30 and/ or £50 in two boxes
	(b)		1 reason	1	C1 for reason why the sample is biased eg <ul style="list-style-type: none"> <li>• they are <b>only</b> in the CD store</li> <li>• the people in the store are more likely to buy CDs</li> <li>• she needs to ask people outside the CD store oe</li> </ul>
21			required region	4	M1 arc radius 5 cm centre $C$ M1 bisector of angle $BAD$ M1 line 3 cm from $DC$ A1 for correct region identified (see overlay)

1MA0_1F				
Question	Working	Answer	Mark	Notes
22		730	5	<p>M1 for <math>\frac{5}{100} \times 200 (= 10)</math> oe</p> <p>M1 for <math>\frac{10}{100} \times 350 (= 35)</math> oe</p> <p>M1 for <math>6 \times '10'</math> <b>or</b> <math>4 \times '35'</math></p> <p>M1 (dep on M1 earned for a correct method for a percentage calculation) for '60' + '140' + 530</p> <p>A1 cao</p> <p><b>Or</b></p> <p>M1 for <math>6 \times 200 (= 1200)</math> <b>or</b> <math>4 \times 350 (= 1400)</math></p> <p>M1 for <math>\frac{5}{100} \times "1200" (= 60)</math> oe</p> <p>M1 for <math>\frac{10}{100} \times "1400" (= 140)</math> oe</p> <p>M1(dep on M1 earned for a correct method for a percentage calculation) for '60' + '140' + 530</p> <p>A1 cao</p>

1MA0_1F				
Question	Working	Answer	Mark	Notes
23		240	4	<p>M1 for <math>16 \times 2</math> (= 32 girls)  M1 for <math>16 + '16 \times 2'</math> (= 48)  M1 (dep on the previous M1) for <math>(16 + '32') \times 5</math> <b>or</b>  <math>(16 + '32') \times (4 + 1)</math>  A1 cao</p> <p>OR</p> <p>M1 for <math>1 : 2 = 3</math> parts  M1 for <math>5 \text{ schools} \times 3</math> parts (= 15 parts)  M1 (dep on the previous M1) for '15' parts <math>\times 16</math>  A1 cao</p> <p><b>SC B2</b> for 176 given on the answer line</p>



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Order Code UG035041 March 2013

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