Mark Scheme (Results)

March 2013

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

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

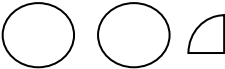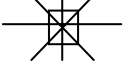| Guidance on the use of codes within this mark scheme |
| --- |
| M1 – method mark
A1 – accuracy mark
B1 – Working mark
C1 – communication mark
QWC – quality of written communication
oe – or equivalent
cao – correct answer only
ft – follow through
sc – special case
dep – dependent (on a previous mark 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 ± 0.2
	(c)		acute	1	B1 cao
	(d)		124	1	B1 for 124 ± 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 $\dfrac{1}{2}$	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)		$\dfrac{3}{12}$	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	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 3×30 OR -30-30-30 M1 for a method to combine the costs of 'their fruit' **or** 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 OR 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 3×30 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 SC B1 £0.20 or 20p as the answer , no working shown

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 7×10 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)	Example of figures for comparison 7min 30 sec with 7 min 28 secs 3 mins 43 secs with 3mins 45 secs 224 secs with 225 secs 3mins 44 secs with 3 mins 45 secs	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 **correct** 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

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

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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 $12 + 4 + 4 + ...$ 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... or 40−'32' M1 ft for $5 + 1 ...$ 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	M1 for 600 – 200 (= 400) M1 for correct method to convert '$400' to £ M1 (dep on the previous M1) for 800 – '$400' in £s A1 for value in the range 540 –560 OR M1 for correct method to convert $600 **and** $200 to pounds M1 for '375'–'125' M1 (dep on the previous M1) 800 –'250' A1 for a value in the range 540-560 OR M1 for correct method to convert £800 to dollars M1 for '1280' + 200 – 600 M1 (dep on the previous M1) for attempt to convert '$880' back to £ A1 for value in the range 540 – 560
15			3 primes that total 20	3	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)

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
16			09 36	3	M1 for listing 9, 18, 27, 36, 45, ... (at least 3 correct multiples with at most one incorrect) M1 for listing 12, 24, 36, 48, ... (at least 3 correct multiples with at most one incorrect) A1 for 09 36 or 9 36(am) OR M1 for listing 9.09 9.18 9.27 9.36 ... (at least 3 correct times with at most one incorrect) M1 for listing 9.12 9.24 9.36 ... (at least 3 correct times with at most one incorrect) A1 for 09 36 or 9 36(am) OR M1 for $9 = 3 \times 3$ **or** $12 = 2 \times 2 \times 3$ (could be in a factor tree) M1 for $9 = 3 \times 3$ **and** $12 = 2 \times 2 \times 3$ (could be in a factor tree) A1 for 09 36 or 9 36(am) SC B2 9 36pm or (after) 36 (minutes) on the answer line
17		Colour / Tally / Frequency table Red Blue Green Silver	Data collection table	3	B3 for correct table with all three aspects without repeats Aspect 1: colour (of car) or for at least 3 of red, blue, green, other etc. Aspect 2: 'tally' or tally marks or 'frequency' or 'number of cars' Aspect 3: 'frequency' or 'total(s)' or 'number of cars' (B2 for two aspects) (B1 for one aspect)

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

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19		183 × 47 1281 7320 8601 (grid method multiplication) 	100	80	3	8601 4000	3200	120	40 700	560	21	7 4000 + 3200 +120 + 700 + 560 + 21 = 8601	86.01	3	M1 for a complete method to multiply 183 by 47 (condone one multiplication error) A1 for digits 8601 given as the answer B1 (dep on M1) for correctly writing their answer to 2 decimal places

Working grid (lattice method):

	1	8	3	×
	0/4	3/2	1/2	4
8	5/7	5/6	2/1	7
	6	0	1	

Grid method:

100	80	3	
4000	3200	120	40
700	560	21	7

4000 + 3200 +120 + 700 + 560 + 21 = 8601

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 • they are **only** in the CD store • the people in the store are more likely to buy CDs • she needs to ask people outside the CD store oe
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	M1 for $\frac{5}{100} \times 200$ $(=10)$ oe

M1 for $\frac{10}{100} \times 350$ $(=35)$ oe

M1 for $6 \times$ '10' **or** $4 \times$ '35'
M1 (dep on M1 earned for a correct method for a percentage calculation) for '60' + '140'+ 530
A1 cao

Or
M1 for $6 \times 200 (=1200)$ **or** $4 \times 350 (=1400)$

M1 for $\frac{5}{100} \times "1200" (=60)$ oe

M1 for $\frac{10}{100} \times "1400" (=140)$ oe

M1(dep on M1 earned for a correct method for a percentage calculation) for '60' + '140'+ 530
A1 cao

1MA0_1F				
Question	Working	Answer	Mark	Notes
23		240	4	M1 for 16×2 (= 32 girls) M1 for $16 +$ '16×2' (= 48) M1 (dep on the previous M1) for $(16 +$ '32') $\times 5$ **or** $(16 +$ '32') $\times (4 + 1)$ A1 cao OR M1 for $1 : 2 = 3$ parts M1 for 5 schools $\times 3$ parts (= 15 parts) M1 (dep on the previous M1) for '15' parts $\times 16$ A1 cao **SC B2** for 176 given on the answer line

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