

Mark Scheme (Results)

November 2012

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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Question		Working	Answer	Mark	Notes
1	(a)		E	1	B1 cao
	(b)		Cylinder	1	B1 for cylinder or circular prism. Use professional judgement re spelling of cylinder
	(c)		6	1	B1 cao
	(d)		8	1	B1 cao
2	(a)		507	1	B1 cao
	(b)		40	1	B1 for 40 or forty or 4 tens (do not accept an answer of “tens”)
	(c)		6000	1	B1 for 6000 or six (6) thousand
3	(a)		43	1	B1 cao
	(b)	3 + 10	13	1	B1 cao
	(c)		7.1 – 7.9 inc.	1	B1 for answer in the range 7.1 – 7.9 inc
4	(a)		36 – 40 inc.	1	B1 for any answer in the range 36 – 40 inc.
	(b)		line	1	B1 for line of length 4.8 – 5.2cm inc.
5	(a)			2	B1 for 6 tins drawn for Thursday B1 for 3 + ½ tins drawn for Friday. Use professional judgement re sketch of semicircle
	(b)		15	2	M1 for (4.5 – 3)×10 or 1.5×10 or 4.5×10 – 3×10 or 45 – 30 or 10 + 5 A1 for 15

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Question		Working	Answer	Mark	Notes
6	(a)		Tuesday	1	B1 for Tuesday (accept 8)
	(b)		– 6	1	B1 cao
	(c)		Wednesday or 8	2	B2 for Wednesday or 8 OR M1 for an attempt to find the difference in at least 3 of: 5 and 4, 8 and 6, 6 and -2, -1 and -4, -3 and -6; ie the answers need not be correct. A1 for Wednesday or 8
7	(a)		$\frac{3}{5}$	2	B2 cao (B1 for $\frac{9}{15}$ oe) [SC: B1 for an answer of $\frac{2}{5}$]
	(b)		0.9	1	B1 for 0.9 or 0.90 or .9
	(c)		No + reason	1	B1 for no and 0.75 or 80% or $\frac{75}{100}$ and $\frac{80}{100}$
8	(a)		 or 	1	B1 for  or 
	(b)			1	B1 cao

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Question		Working	Answer	Mark	Notes
9	(a)		No + reason	1	B1 for no and the (prob.) of red is (bigger than the (prob.) of blue. OR (prob.) of blue is nearer 0 OR (prob.) of red is closer to 1 OR (prob.) of red is 50% and the (prob.) of blue is about 20% oe
	(b)(i)		$\frac{4}{7}$	2	B1 for $\frac{4}{7}$ oe
	(ii)		0		B1 for 0 or $\frac{0}{7}$ or 0% (accept 0 out of 7, but not 0:7 or 0 to 7)
10		F + C + S $30 + 7 + 8 = 45$ $3 \times 20 - 45 = 15$	15	4	M2 for $30 + 7 + 8 (= 45)$ (M1 for $12 \times 2 + 7 \times 3 + 8 (= 53)$ or $12 \times 2 + 7 \times 2 (= 38)$) M1 (dep on at least M1) for “ 20×3 ” – “45” or “ 20×3 ” – “53” A1 cao [SC: B1 for an answer of 22 if M0 scored]
11	(a)		(1, 2)	1	B1 cao (accept coordinates just shown on the grid)
	(b)		(0, -3)	1	B1 cao (accept coordinates just shown on the grid)
	(c)		(3, -2)	1	B1 for (3, -2) or (-3, -4) or (-1, 6) [SC: B1 for coordinates reversed, (-2, 3) or (-4, -3) or (6, -1) if coordinates reversed in parts (a) and (b)]

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Question		Working	Answer	Mark	Notes
12	(a)(i)		19	2	B1 cao
	(ii)		Add 4		B1 for add 4 (+4) oe or $4n - 1$ (or $\times 4 - 1$)
	(b)	$15 - 10 = 5$ $5 \times 4 = 20$	20	2	M1 for $(15-10) \times 4$ or $4 + 4 + 4 + 4 + 4$ or 59, 39 or $(4 \times 15 - 1) - (4 \times 10 - 1)$ or '59' - '39' from a list A1 cao
13	(a)		$3f$	1	B1 for $3f$ or $f3$ or $3 \times f$ or $f \times 3$
	(b)		$6m$	1	B1 for $6m$ or $m6$
	(c)		$4a + 5h$	2	B2 for $4a + 5h$ or $5h + 4a$ (B1 for $4a$ or $5h$ or $4a + 5h = 9ah$)
14	(a)		08 50	1	B1 for 08 50 or 8 50 (am) or 10 to 9
	(b)	13 43 – 13 29	14	1	B1 cao
	(c)*	e.g. HL to SC: 11 02 – 11 41 Visit (at least 3 hours) SC to HL: 15 16 – 15 49 [Note : there are 9 possible solutions]	A fully correct plan showing departure times and arrival times of the two bus journeys	4	B1 for a departure time of 08 02 or 09 04 or 10 12 or 11 02 from HL M1 (indep) for a correct arrival time at SC and a correct departure time from SC (or Cartbridge St) which allows for a stay of at least 3 hours in SC (the differencing does not have to be seen) OR for correctly adding 3 hours to a their arrival time at SC B1 for a departure time from SC of 13 20 (13 11 from CS) or 14 24 (14 14 from CS) or 15 16 (15 07 from CS) C1 (dep on M1) for a complete correct plan which includes the departure and arrival times of the two bus journeys [Note: bus departure times may be identified by their starting times. Eg the 15 07 from Cartbridge Street would be acceptable for the identification of the bus which arrives a HL at 15 49]

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Question		Working	Answer	Mark	Notes
15	(a)		32	1	B1 cao
	(b)	e.g. \$20 = £12.50 \$100 = 5 × £12.50 = £62.50 £62.50 – 60 = £2.50	£2.50 OR \$4	3	M1 for a correct method to convert \$100 to £, e.g. 5 × ‘12.50’ (= 62.50) (‘12.50’ is their reading from the graph at \$20) M1 (dep) for ‘62.50’ – 60 A1 for £2.5(0) (units must be stated) OR M1 for correct method to convert £60 to \$, e.g. 3 × 32 (=96) or ft their answer to part (a) M1 (dep) for 100 – ‘96’ A1 for \$4 (units must be stated)
16	(a)	3 × 3 × 3 × 3	81	1	B1 cao
	(b)		4	1	B1 cao
17	(a)		7	1	B1 cao
	(b)		12	1	B1 cao
	(c)	5w = 10 + 6 w = 16 ÷ 5 or $w - \frac{6}{5} = \frac{10}{5}$ oe	16/5 oe	2	M1 for 5w – 6 + 6 = 10 + 6 oe or $w - \frac{6}{5} = \frac{10}{5}$ oe A1 for $\frac{16}{5}, 3\frac{1}{5}, 3.2$, oe

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Question		Working	Answer	Mark	Notes
18	(a)		21	1	B1 cao
	(b)		17	1	B1 cao
	(c)	55 – 15	40	2	M1 for 55 – 15 (accept 15 – 55 or 15 to 55 or 55 to 15 or 15, 55 but not 15 + 55) A1 cao
19*		360 – 200 – 90 (=70) (180 – ‘70’) ÷ 2 angles at a point add to 360°, angles in a triangle add to 180°, base angles of an isosceles triangle are equal	y = 55 reasons	4	M1 for 360 – 200 – 90 oe M1 for (180 – ‘70’) ÷ 2 Reasons: <u>angles</u> at a <u>point</u> add up to <u>360°</u> <u>angles</u> in a <u>triangle</u> add up to <u>180°</u> base <u>angles</u> of an <u>isosceles</u> triangle are <u>equal</u> C2 for y = 55° and all correct reasons Note: An answer of 55° alone, is not enough; y = 55° must be explicitly stated or clearly shown on the diagram (C1 for one correct reason) Note: the award of any C mark is dependant upon the award of at least M1

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Question	Working	Answer	Mark	Notes
20	$\frac{1}{2} \times 60 = 30, 30 \times 5 = 150$ $\frac{1}{3} \times 60 = 20, 20 \times 4 = \text{£}80$ $3 \times 60 = 180$ $180 + 75 - 150 - 80 = \text{£}25$ 10 bags (i.e. $60 - 30 - 20$) sold for 25 $25 \div 10 = 2.50$ OR $\frac{1}{2} \times 60 = 30, 30 \times \text{£}2 = \text{£}60$ profit $\frac{1}{3} \times 60 = 20, 20 \times \text{£}1 = \text{£}20$ profit $60 + 20 = \text{£}80$ $80 - 75 = 5$ loss on 10 bags (i.e. $60 - 30 - 20$) $10 \times \text{£}3 = \text{£}30$ $30 - 5 = \text{£}25$ $\text{£}25 \div 10 = \text{£}2.50$	2.50	4	M1 for $\frac{1}{2} \times 60 \times 5 (=150)$ or $\frac{1}{3} \times 60 \times 4 (=80)$ M1 (dep on 1st M1) for $3 \times 60 + 75 - '150' - '80'$ oe (=25) M1 (dep on previous M1) for $'25' \div (60 - '30' - '20')$ A1 for 2.50 (accept 2.5) OR M1 for $\frac{1}{2} \times 60 \times 2 (=60)$ or $\frac{1}{3} \times 60 \times 1 (=20)$ M1 (dep on 1st M1) for $(60 - '30' - '20') \times 3 - ('60' + '20' - 75)$ oe (=25) M1 (dep on previous M1) for $'25' \div (60 - '30' - '20')$ A1 for 2.50 (accept 2.5)

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Question	Working	Answer	Mark	Notes																				
21	<p>e.g. $41 - 21 (=20)$ $49 - 10 - 20 (=19)$ $16 + 19 = 35$</p> <p>OR $(100 - 49) - (16 + 21) (=14)$ $14 + 10 (=24)$ $100 - (41 + 24) = 35$</p> <table border="1"> <tr> <td></td><td>w</td><td>b</td><td>c</td><td></td></tr> <tr> <td>Boys</td><td>16</td><td>21</td><td>14</td><td>51</td></tr> <tr> <td>Girls</td><td>19</td><td>20</td><td>10</td><td>49</td></tr> <tr> <td></td><td>35</td><td>41</td><td>24</td><td>100</td></tr> </table>		w	b	c		Boys	16	21	14	51	Girls	19	20	10	49		35	41	24	100	35	4	<p>M1 for $41 - 21 (=20)$ or M1 for $49 - 10 - '20' (=19)$ M1 for $16 + '19'$ A1 cao</p> <p>OR</p> <p>M1 for $100 - 49 (=51)$ M1 for $'51' - 21 - 16 (=14)$ and $'14' + 10 (=24)$ M1 for $100 - (41 + '24')$ A1 cao</p> <p>NB working may appear in table or diagram</p>
	w	b	c																					
Boys	16	21	14	51																				
Girls	19	20	10	49																				
	35	41	24	100																				
22		4×6 rectangle	2	<p>B2 for a single 4×6 rectangle drawn anywhere on the grid (B1 for a single 4×n rectangle or a single m×6 rectangle drawn anywhere on the grid)</p> <p>Note: All nets and 3-D sketches get NO marks</p>																				

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Question		Working	Answer	Mark	Notes
23		180×1.5 40×1.5 110×1.5 30×1.5	Flour = 270 Ginger = 60 Butter = 165 Sugar = 45	3	M1 for $\times 24 \div 16$ oe or $24/16$ or 1.5 seen or $180 + 90 (=270)$ or $40 + 20 (=60)$ or $110 + 55 (=165)$ or $30 + 15 (=45)$ or sight of any one of the correct answers A2 for all 4 correct answers (A1 for 2 or 3 correct answers)
24	(a)		Positive (correlation)	1	B1 for positive (correlation) [do not accept a relationship]
	(b)		83 to 87 inc.	2	B2 for an answer in the range 83 to 87 inc. OR M1 for a single straight line segment with positive gradient that could be used as a line of best fit or for an indication on the diagram from 148 on the height axis A1 ft from their line of best fit
25		$\frac{9}{2} \times (12 + 18) = 135$ $135 \div 20 = 6.75 (=7 \text{ bags})$ 7×4.99 OR $18 \times 9 - \frac{1}{2}(6 \times 9) = 135$ $135 \div 20 = 6.75 (=7 \text{ bags})$ 7×4.99	34.93	4	M1 for $\frac{9}{2} \times (12 + 18)$ or $18 \times 9 - \frac{1}{2}(6 \times 9)$ or $9 \times 12 + \frac{1}{2} \times (18 - 12) \times 9$ or 135 seen M1 (dep) for '135' $\div 20$ or 6 or 7 seen M1 (dep on previous M1) for '6' $\times 4.99$ or '7' $\times 4.99$ A1 cao [SC: M1 for $(12 \times 9 + 6 \times 9) \div 20 (= 162 \div 20)$ or 8 or 9 seen M1 (dep) for '8' $\times 4.99$ or '9' $\times 4.99$ OR M1 for $(18 \times 9 - 6 \times 9) \div 20 (= 108 \div 20)$ or 5 or 6 seen M1 (dep) for '5' $\times 4.99$ or '6' $\times 4.99$]

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Question	Working	Answer	Mark	Notes
26		Eg. How many hours do you read each day? 0 to 1 h <input type="text"/> over 1 h to 2 h <input type="text"/> over 2 h <input type="text"/>	2	B1 for an appropriate question with reference to a time frame, with a unit of time, or a question with a time frame, with a unit of time, implied by responses B1 for at least 3 non-overlapping boxes (ignore if not exhaustive) or for at least 3 exhaustive boxes (ignore if any overlapping) [Note: labels on response boxes must not be inequalities] Do not accept frequency tables or data collection sheets for award of the second B mark
27	Area of cross section $4 \times 7 + 5 \times 2$ or $9 \times 2 + 5 \times 4$ OR $9 \times 7 - 5 \times 5 (= 38)$	380	3	M1 for $4 \times 7 + 5 \times 2 (=38)$ or $9 \times 2 + 5 \times 4 (=38)$ or $7 \times 9 - 5 \times 5 (=38)$ or $4 \times 7 \times 10$ or $5 \times 2 \times 10 (=100)$ or $9 \times 2 \times 10 (=180)$ or $5 \times 4 \times 10 (=200)$ or $9 \times 7 \times 10 (=630)$ or $5 \times 5 \times 10 (=250)$ M1 (dep) for '38' $\times 10$ or 380 or $4 \times 7 \times 10 + 5 \times 2 \times 10$ or $9 \times 2 \times 10 + 5 \times 4 \times 10$ or $(7 \times 9 - 5 \times 5) \times 10$ A1 cao
28		Region shaded	3	B1 for circle arc of radius 3cm (± 2 mm) centre Burford B1 for circle arc of radius 5 cm (± 2 mm) centre Hightown B1 for overlapping regions of circle arcs shaded

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Question	Working	Answer	Mark	Notes
29*	$180 \div 9 \times 1 : 180 \div 9 \times 3 : 180 \div 9 \times 5$ $= 20 : 60 : 100$ Not enough cement (but enough sand and enough gravel) OR $1 \times 15 : 3 \times 15 : 5 \times 15$ $= 15 : 45 : 75$ $15 + 45 + 75 = 135 (< 180)$ Not enough cement (to make 180kg of concrete)	No + reason	4	M1 for $180 \div (1+3+5)$ (=20) or 3 multiples of 1: 3: 5 M1 for $1 \times '20'$ or $3 \times '20'$ or $5 \times '20'$ or 20 seen or 60 seen or 100 seen A1 for (Cement=) 20, (Sand=) 60, (Gravel=) 100 C1 ft (provided both Ms awarded) for not enough cement oe OR M1 for $(1 \times 15 \text{ and}) 3 \times 15 \text{ and } 5 \times 15$ or 9×15 or sight of the numbers 15, 45, 75 together. M1 for $'15' + '45' + '75'$ A1 for 135 (<180) C1 ft (provided both Ms awarded) for not enough cement oe

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