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Mark Scheme (Results)

Summer 2012

GCSE Mathematics Linked Pair Pilot
Application of Mathematics (2AM01)
Foundation (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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 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

5AM1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1		1.22 + 3.08	4.30	3	B1 for 1.22 or 3.08 M1 for 1.22+'3.08' A1 cao
2		3 × 40=120 10% is 12	132	3	M1 for 3×40 or 120 seen M1 for 0.1 × '120' oe or 12 A1 cao **OR** M1 for 0.1 × 40 oe or 4 seen M1 for 3×'4' or 12 A1 cao **OR** M1 for 1.1 × 40 oe or 44 seen M1 for 3×'44' A1 cao
3	(a)		$\frac{1}{5}$	1	B1 for $\frac{1}{5}$ oe or 20% or 0.2
	(b)	50×141.4	70.70	3	M1 for 50 × 141.4 A1 for digits 7070 A1 for 70.7(0)
4		14–7+5–10+6 OR 14–2–4	8	3	M1 for 14–7+5 or 12 M1 for '12'–10+6 A1 cao **OR** M1 for –7+5 or –10+6 M1 for 12+' –2'+' –4' A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)(i)		square	2	B1 cao
	(ii)		rhombus		B1 for rhombus accept square
	(b)(i)		4 lines drawn	4	B2 for exactly 4 correct lines drawn (B1 for 1 correct line drawn)
	(ii)		5.1		B2 for 5.0–5.4 (B1 for 50–54)
6	(a)		75 = 1.5c	2	M1 for1.5*c* or 75=… A1 for 75 = 1.5*c* oe
	(b)	$\frac{75}{1.5}$	50	2	M1 for $\frac{'75'}{'1.5'}$ oe or 75÷1.5 or 1.5×50 A1 cao
*7			diagram or chart	4	B1 for a key or suitable label to identify London and Malaga B1 for 5 or 6 months correctly labelled B1 for diagram(s) or chart(s) set up for comparisons, eg dual bar chart, back to back stem and leaf diagram, pie charts etc C1for fully correct diagram or chart to include temperature ‘axis’ correctly scaled and labelled

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Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		(2,8)	1	B1 cao
	(b)		point plotted at (6, 2)	1	B1 for point plotted at (6, 2)
	(c)		(4, 5)	2	M1 for indication of midpoint for their point C A1 cao **OR** M1 for $(\frac{'2'+6}{2}, \frac{'8'+2}{2})$ A1 cao SC B1 for (5, 4) or (7, 2)
9			type / tally / freq.	3	B3 for data collection sheet with three aspects aspect 1: column/row labelled types (of music) or list of at least three types of music aspect 2: column/row labelled tally aspect 3: column/row labelled frequency or total oe (B2 for two aspects B1 for one aspect)
10	(a)		60	1	B1 cao
	(b)		6	2	M1 for 3×2 or 2+2+2 A1 for 6

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Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)(i)		1200	2	B1 cao
	(ii)		1.2		B1 for 1.2 or ft '1200' ÷ 1000
	(b)		50	1	B1 cao
12	(a)		May	1	B1 cao
	(b)	3+4+2+3+7+1+4+3+1+3+5	36	2	M1 for 3+4+2+3+7+1+4+3+1+3+5 condone one error or omission A1 cao
13	(a)	$x + 3x + 2x = 180$ 180 ÷ 6	30	3	M1 for $3x + 2x + x$ or $6x$ or 180 seen M1 for 180÷6 or 30, 60 and 90 A1 cao
	(b)		radius	1	B1 cao
	(c)		arc	1	B1cao
14	(a)		Ace 38	1	B1 for (Ace) 38
	(b)		Ace 38 and Ace 45	1	B1 for both (Ace) 38 and (Ace) 45
	(c)		3	1	B1 cao
	(d)		reason	1	B1 for correct reason, eg least RAM, low/less storage, only 250Gb

5AM1F_01

Question		Working	Answer	Mark	Notes
15		<table><tr><td></td><td>A</td><td>L</td><td>C</td><td>tot</td></tr><tr><td>S</td><td></td><td></td><td></td><td>15</td></tr><tr><td>M</td><td></td><td>21</td><td></td><td></td></tr><tr><td>L</td><td>9</td><td></td><td>4</td><td>20</td></tr><tr><td>tot</td><td></td><td>33</td><td>32</td><td></td></tr></table>	15 21 9, 4, 20 33, 32	3	B3 for all 7 correct (B2 for 5 or 6 correct B1 for 3 or 4 correct)
16	(a)(i)		4	2	B1 cao
	(ii)		5		B1 cao
	(b)		mode and reason	1	B1 for mode or (size) 4 with reason, eg most popular size, sells more of these etc
*17		12×1.2=14.40 OR 14÷1.2=11.66666	Spain better value	3	M1 for 12×1.2 or 14÷1.2 A1 for 14.4(0) and (£)11.67 or (£)11.66 C1 (dep on M1) for correct conclusion based on their figures, eg Spain better value or Spain costs less
18	(a)		(Bindings) 90 102	2	B2 for (£)90 and (£)102 (B1 for one correct entry)
	(b)		= C2–B2 = B2+B3+B4+B5+B6	3	B1 for (=)C2–B2 oe B1 for (=)B2+B3+B4+B5+B6 or (=)SUM(B2:B6) oe or intention to add correct cells is clear B1 for using correct spread sheet notation in both cases condone missing =

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Question		**Working**	**Answer**	**Mark**	**Notes**
*19		70÷100×120=84 4÷5×120=96 so Rose longer **OR** 70÷100=0.7 4÷5=0.8 Rose longer **OR** 70% 4÷5×100=80% Rose longer **OR** 70% = 7/10 4/5 = 8/10 Rose longer	Rose plays longer	3	M1 for 70÷100×120 (=84) or 4÷5×120 (=96) M1 for 70÷100×120 (=84) and 4÷5×120 (=96) C1 for Rose (plays) longer oe with 84 and 96 **OR** M1 for 70÷100 (=0.7) or 4÷5 (=0.8) M1 for 70÷100 (=0.7) and 4÷5 (=0.8) C1 for Rose (plays) longer oe with 0.7 and 0.8 **OR** M2 for 4÷5×100 (=80%) C1 for Rose (plays) longer oe with 80% **OR** M1 for 70/100 or 80/100 oe M1 for 70/100 and 80/100 oe C1 for Rose (plays) longer oe with 7/10 and 8/10
20		2×1.8=3.6	no with supporting work	3	M2 for height of lorry 3 – 4 (metres) oe (M1 for man's height seen as 1.5–2 (metres) oe or for 2×man's height) C1 (dep on M1) for no with supporting work

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Question		**Working**	**Answer**	**Mark**	**Notes**
21	(a)	150÷3 **OR** 3,6,9,12,15,(…)	50	2	M1 for 150÷3 or at least the first 5 multiples of 3 which may come from addition or subtraction A1 cao
	(b)		7	2	M1 for 150÷20 or 7.5 seen or multiples of 20 up to 140 or up to 160 or subtracting 20s down to 10 or −10 A1 cao
	(c)	3×20 = 60 150 ÷ 60 **OR** 20,40,<u>60</u>,80,100,<u>120</u>,140 3, 6, …, <u>60</u>, …, <u>120</u>, …	2	2	M1 for 20×3 or 60 seen or 150÷60 oe A1 cao **OR** M1 for listing 20 times table with 60 or 120 identified or listing 3 times table with 60 or 120 or 180 identified A1 cao (SC B1 for 2.5)
*22		$p + 2p + 2p - 3 = 17$ $5p - 3 = 17$ $5p = 20$ $p = 4$, so 4, 8, 5	4, 8, 5	5	M1 for $2p$ or $2p-3$ seen M1 for p +'$2p$' + '$2p - 3$' M1 for p +'$2p$' + '$2p - 3$' = 17 A1 for 4 or 8 or 5 C1 for Alan 4,Ben 8 and Clara 5 oe **OR** M1 for choosing a value for p M1 for attempting a trial M1 for attempting at least 2 trials with totals A1 for 4 or 8 or 5 C1 for Alan 4,Ben 8 and Clara 5 oe

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Question		**Working**	**Answer**	**Mark**	**Notes**
*23		<table><tr><th></th><th>A</th><th>B</th><th>C</th></tr><tr><td>l</td><td>38</td><td>40.5−40.95</td><td>38.8−40</td></tr><tr><td>g</td><td>8.35−8.44</td><td>9</td><td>8.75</td></tr><tr><td>p</td><td>66.5−68.4</td><td>72</td><td>70</td></tr></table>	A,C,B	4	(litres) M1 for 9×4.5 (=40.5) or 70÷1.75 (=40) M1 for 9×4.5 (=40.5) and 70÷1.75 (=40) A1 for 40.5−40.95 and 38.8−40 **OR** (galls) M1 for 38÷4.5 (=8.4 or better) or 70÷8 (=8.75) M1 for 38÷4.5 (=8.4 or better) and 70÷8 (=8.75) A1 for 8.35−8.44 and 8.75 **OR** (pints) M1 for 38×1.75 (=66.5) or 9×8 (=72) M1 for 38×1.75 (=66.5) and 9×8 (=72) A1 for 66.5−68.4 and 72 C1 (dep on M1) for correct order identified with quantities, ie A,C,B or B,C,A or ft for correct order from their quantities
24	(a)	4×4=16 16×5=80 **OR** 12×12=144 4×4=16 16×4=64 144–64=80	80	3	M1 for attempt to calculate area of small square, ie 4×4 or 16 seen M1 for 5 × ‘area of small square’ A1 cao (SC B1 for 64) **OR** (subtraction) M1 for attempt to calculate area of large square, ie 12×12 or 144 seen M1 for ‘area of large square’–4 ×’ area of small square’ A1cao
	(b)		48	2	M1 for 12× 4 oe A1 for 48 or greater than 48 if an overlap is indicated

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Question		**Working**	**Answer**	**Mark**	**Notes**
25		f:b:s = 3:2:1 900 ÷ 6 **OR** $s+2s+3s=900$ $6s = 900$ $s = 900 \div 6$ **OR** eg 150, 100, 50 (=300) 300, 200, 100 (=600) 450, 300, 150 (=900)	150	4	M1 for b:s = 2:1 oe or $b = 2s$ or $f = 3s$ or $f = 1.5b$ oe M1 for f:b:s = 3:2:1 or $b = 2s$ and $f = 3s$ oe M1 for 900 ÷ '6' or s + b + f (= 900) A1 cao **OR** M1 for s,2s,3s oe used in algebraic method condone one error M1for reducing '$s + 2s + 3s$' to the form $as = 900$ M1 for 900 ÷ '6' A1 cao **OR** M1 for trial and improvement method using butter = 2×sugar or flour = 1.5×butter oe M1 for an attempt to use butter = 2×sugar and flour = 1.5×butter oe for one trial, eg 150, 100, 50 M1 for an attempt to use butter = 2×sugar and flour = 1.5×butter oe for another trial A1 cao
26	(a)		0	1	B1 for (£)0
	(b)		£30 000	3	M1 for 400 000–325 000 or 75 000 seen M1 (dep) for 0.4×'(400 000–325 000)' A1for (£) 30 000

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