Mark Scheme (Results)

November 2011

Modular Mathematics (GCSE)
Unit 1: 5MB1F_01 (Foundation)

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		4, 6, 8, 2	2	B2 all frequencies correct (B1 2 frequencies correct OR 2 tallies correct OR 1 tally with its frequency correct)
	(b)		silver	1	B1 for silver or ft from table
2	(a)		18	1	B1 cao
	(b)		¼ box 3 full size boxes	2	B1 cao B1 cao
3	(a)		cross at ½	1	B1 at ½ with tolerance of ±2mm
	(b)		cross at 1	1	B1 at 1 with tolerance of ±2mm
	(c)		cross approx at ¼	1	B1 from cross between 1/8 and 3/8 from end.
4		(S,I), (S,F), (S,D), (P,I), (P,F), (P,D), (C,I), (C,F), (C,D)	combinations	2	B2 for listing all 8 extra combinations (B1 listing 4 or more extra combinations ignoring repeats)

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Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)		7	1	B1 cao
	(b)		Wednesday	1	B1 cao
	(c)	Andrew: 8 + 10 + 17 + 10 (=45) Rachel: 16 + 8 + 12 + 7 (=43) Then 45 – 43 = 2 OR Differences: -8, 2, 5, 3 -8 + 2 + 5 + 3 = 2	2	3	M1 for Andrew: 8 + 10 + 17 + 10 (at least 3 correct) (=45) or: Rachel: 16 + 8 + 12 + 7 (at least 3 correct) (=43) M1 (dep) for "45" – "43" = 2 A1 cao OR M1 for Differences: at least 3 from 2, 5, 3, 8 M1 (dep) for "2" + "5" + "3" – "8" (at least 3) A1 cao
6	(a)		0915	1	B1 for 0915 or 9.15am or other times that identify the train: 0930, 0955, 1040
	(b)	0930-0800 = 1h30 or 90 min 1040-0915 = 1h25 or 85 min 1152-1030 = 1h22 or 82 min	82	3	M1 for an intention or attempt to work out the time of one train: eg 0930-0800 (=1h30oe) or 1040-0915 (=1h25oe) or1152-1030 (=1h22oe) M1 for an attempt to work out the time of all three trains; OR finding the difference between time duration s of at least two trains; OR stating the duration of at least one train correctly, with an attempt at another train duration ; OR stating two durations correctly. A1 82 or 1 h 22 min SC: B2 for 1f 22min stated incorrectly eg 1:22, 1.22, 122
	(c)		45	1	B1 cao

Question		Working	Answer	Mark	Notes
7			Diagram or chart	4	B1 labeling or key to identify boys / girls B1 5 correct sports labels to identify the sports B1 diagram or chart (combined or separate) enabling comparison eg dual bar chart, bar chart, pie chart, composite bar chart, line graphs C1 (dependent on at least B1) fully correct diagram or chart with all labels correct and clear
8	(a)		2	1	B1 cao
	(b)		11	2	M1 for 12 – a or b – 12 or 12 – 1 or -11 A1 for 11
	(c)		4	2	M1 for attempted ordering with or without the 9th number (5), or clear evidence of selecting the middle number from an unordered list. A1 cao
9	(a)		Data collection sheet	3	B1 labels (eg transport) B1 tallies B1 frequency (or total, etc.)
	(b)		Reason	1	B1 biased; not everyone uses the road and comes by car, she will only get people who travel by car, etc.; more times are needed other than just one afternoon

Question		Working	Answer	Mark	Notes
*10		(2×625)+200+350=1800 (2×725)+150+275=1875 (2×640)+(2×170)=1620	Sunswift at £1620	5	M1 for correctly choosing a table column (11-20 June) M1 for use of 2 adults and 2 correctly aged children (eg 4 corresponding figures for at least one hotel) M1 for using costings consistently for at least two hotels (eg two of 625,200,350; 725,150,275; 640,170, 170 or ft their choice of table column) A1 for showing correct totals: 1800, 1875 and 1620. C1 (dep on at least M1 awarded) for using three comparable figures identified with each hotel, correctly deduces the cheapest hotel, and clearly names it.
11	(a)	construction = 120° hairdressing = 168° tourism = 72°	120° 168° 72°	3	M1 for correct working to find an angle (could be implied by one angle drawn correctly on the pie chart. A1 all three angles drawn ±2° B1 (dep on M1) correct labels NB: stating the angles is not labels
	(b)		explanation	1	B1 ft reason given eg NO and "we don't know the actual figures", "there could be less Y10 students", or refers to the fact that the totals for the pie charts (or the sample groups) could be different NB: YES could also be justified.
12	(a)	1-(0.4+0.25+0.15) 1-0.8	0.2	2	M1 for 1 – "(0.4+0.25+0.15)" or 1 – 0.8 or sight of 0.92 A1 for 0.2 oe
	(b)	0.4 × 60	24	2	M1 for 0.4 × 60 A1 for 24 or "24 out of 60" SC B1 for $\dfrac{24}{60}$ or 24 in 60

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Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)		Reasons	2	1st aspect: no time frame 2nd aspect: overlapping boxes 3rd aspect: not exhaustive ie no <1, no "other", no >30 B2 for two aspects (B1 for 1 aspect)
	(b)		Question and responses	2	1st aspect: question including time frame (or question and time frame in response boxes) 2nd aspect: at least 3 non overlapping response boxes, with discrete values or a range; need not be inclusive of all; OR a set of at least 3 boxes which are exhaustive (but which may overlap). B2 for two aspects (B1 for 1 aspect)
14	(a)		Points plotted	1	B1 points plotted (180,72) and (170,65) ±2mm
	(b)		Positive	1	B1 positive (correlation) cao
	(c)		Line of best fit	1	B1 line passing between (140,40)(140,55) and between (185,60)(185,75) with a positive gradient
	(d)		52-60	1	B1 within the range 52-60 or ft a single straight line segment with positive gradient.

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Question	Working	Answer	Mark	Notes
15	$60 \div 12 = 5$ $2\times5=10$; $3\times5=15$; $7\times5=35$	10 15 35	3	M1 for $60 \div (2+3+7)$ or $\times5$ or multiple build-up (at least 4 correct) eg 2:3:7, 4:6:14 ,6:12:28, 8:12:28 M1 for $60\div(2+3+7) \times2$ or $60\div(2+3+7) \times3$ or $60\div(2+3+7) \times7$ or sight of the numbers 10,15,35 together or 2×5 or 3×5 or 7×5 A1 cao SC: B1 for 2 correct numbers out of 3 in a ratio
16	$(x + x + 3 + 2x) \div 3$ $= (4x + 3) \div 3$	$\dfrac{x + x + 3 + 2x}{3}$ oe	2	M1 $x + x + 3 + 2x$ $(=4x+3)$ oe or $4x + 3 \div 3$ oe A1 $\dfrac{x + x + 3 + 2x}{3}$ oe

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