Mark Scheme (Results)

November 2010

GCSE Mathematics (Modular) 5MB1F
Unit 1 - 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     If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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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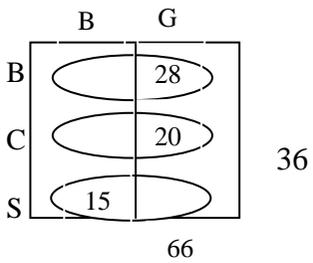| Question		Working	Answer	Mark	Notes
1	(a)		8	1	B1 cao
	(b)		5	1	B1 cao
	(c)			1	B1 cao
2	(a)		Pixar	1	B1 cao
	(b)		Pixar, Tacco	1	B1 cao
	(c)		Crystal	1	B1 cao
	(d)		12.73	4	M1 for 112−100 or 12 seen M1 for $24.5 \times '12'$ or sight of digits 294 Do not allow '12' to be 100. M1 (dep on one prior M1) for $9.79 + '2.94'$ A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
3			e.g. 15 12 15 40 4:15pm 19 30 19 55	5	B1 for a correct departure time (one with an associated arrival time at least 30 mins before film start time) B1 for correct associated arrival time in Peterborough from a correct departure time from Bourne or Baston B1 for either 4:15pm or 5:15pm with one correct bus time) B1 for a correct departure time (at least 2hrs 44mins after film start time) B1 for correct associated arrival time in Baston
4	(a)		unlikely	1	B1 cao
	(b)		even	1	B1 cao
	(c)		impossible		B1 cao
	(d)		e.g. blue, blue, blue	1 1	B1 for two or three 'blue' and no 'red'
5	(a)		Walk	1	B1 cao
	(b)		5	1	B1 cao
	(c)	$4+6+9+5+1=25$	25	2	M1 for adding the frequencies 4,6,9,5,1 or adding 5 frequencies allow one misread error Ie 4+6+9+6+1 A1 cao

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Question	**Working**	**Answer**	**Mark**	**Notes**
6 (a)		6	1	B1 cao
(b)		4, 4, 7	2	M1 for identifying two of the numbers as 4 or the sum as 15 (may be implied by three numbers that sum to 15) A1 for 4, 4 and 7 in any order
7*		Diagram or chart	4	B1 for a key or suitable labels to identify boys and girls The key may be ignored if unclear provided the graph is clear, ie if different colours are used to shade in the graph. Give benefit to candidate. B1 for 5 correct labels for days clearly in the appropriate place B1 for a diagram(s) or chart(s)(combined or separate) set up for comparison, showing data for at least three days e.g. dual bar chart, back-to-back stem and leaf diagrams, pie charts, pictograms, etc C1 fully correct diagram or chart to include all axes labeled. QWC: Fully correct diagram or chart and all labelling is correct and clear.

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Question		Working	Answer	Mark	Notes
8	(a)	0.80×20 OR reading from graph at distance = 20 miles	16	1	B1 cao
	(b)	$£20 = 25 \, \text{miles}$ $25 \times 3 = 75$ OR $60 \div 0.8 = 75$	75	2	M1 for using $£20 = 25$ miles oe and intention to multiply OR M1 for $60 \div 0.8$ OR M1 for reading from the graph and an attempt to scale up. Ie 37x2 or 38x2 or 12x6 or 12.5x6 or 13x6 oe And A1 72-78 inclusive
9			Types Tally Frequency	3	B3 for correct table with all three aspects Aspect 1:'method of travel' or for at least 3 of bus, car, walk, ,other etc. Aspect 2: 'tally' or tally marks or 'frequency' or 'number of people' Aspect 3: 'frequency' or frequencies or 'total' or totals or 'number of people' B2 for two aspects B1 for one aspect

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Question	Working	Answer	Mark	Notes
10 (a)		3	1	B1 cao
(b)	$0 \times 4 + 1 \times 5 + 2 \times 4 + 3 \times 7 + 4 \times 4 = 50$	50	2	M1 for fx calculated (could be implied by at least 2 correct) A1 cao
(c)	$360° \div 24 = 15$ Sector angles: W=150; D=90; L=120	Angles drawn, labelled	3	M1 for $360 \div 24$ or 15 seen or one angle correct in pie chart ($\pm 2°$), ignore all labels, or one correct angle in the table A1 for any two angles correct in pie chart. Ignore labels A1 for fully correct and labelled pie chart All angles ±2°

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Question	Working	Answer	Mark	Notes
11*	714 × 2 =1428 714 × 0.95 = 678.30 678.30 × 2 = 1356.60 1428 + 1356.60 = 2784.60 802 × 2 = 1604 802 × 0.85 = 681.70 681.70 × 2 = 1363.40 1604 + 1363.40 = 2967.40	Comparison	5	B1 for identifying 714 and 802 M1 for $\frac{95}{100} \times '714'$ oe or $\frac{85}{100} \times '802'$ oe M1 for 2 × 'adult' + 2 × 'child' oe for at least on e holiday A1 for 2784.6(0) and 2967.4(0) or 2785 and 2967 C1 for comparing the costs of their two holidays for 2 adults and 2 children and clearly indicating which is cheaper. Conclusion must clearly follow from working. QWC: Decision and justification should be clear with working clearly presented and attributable. (allow full marks for a candidate who has calculated the cost per day for each holiday (397.8(0) and 211.95(7..)) and compares these costs accordingly.)

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Question	**Working**	**Answer**	**Mark**	**Notes**
12 (a)		67	1	B1 cao
(b)	$84 - 58 = 26$	26	2	M1 for $84 - 58$, accept 58 to 84 and $58 - 84$ A1 cao
(c)		Two comparisons	2	Ft B1 for heart rates faster after walking , bigger median, median increase by 11 Ft B1 for heart rates more spread out after walking, bigger range, range increases by 11 Statements must be entirely true and not contradictory
13		51	4	M1 for a two-way table or Venn diagram with bowling, cinema, skating, boys and girls labelled or a list of at least two combinations clearly labelled. M1 for attempt to find an unknown eg 66 – 28 – 20, 120 – 66, 36 – 20 A1 for 16 or 18 or 54 or 23 or 33 A1 cao (Note: 36 + 15 = 51 scores no marks)

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Question	Working	Answer	Mark	Notes
14*	$13.55 \times 1.65 = 22.3575$ $3.10 \div 160 \times 1000 = 19.375$ OR $13.55 \times 1.65 = 22.3575$ $22.3575 \div 1000 \times 160 = 3.5772$ OR $3.10 \div 1.65 = 1.8787…$ $1.8787…\div 160 \times 1000$ per kg OR $1355 \div 1000 = 1.355\,\text{p/g}$ $3.10 \div 1.65 = 187.87…\text{p}$ $187.87…\div 160 = 1.1742…\text{p/g}$ OR $3.10 \div 160 = 0.019375$ SF/g $13.55 \times 1.65 \div 1000$ $=0.0223575$SF/g	Switzerland, with correct explanation	4	M1 for a correct method to obtain two comparable weights e.g. cost of 1kg in Switzerland, ÷ 160 × 1000, × 6.25 (cost of 1 kg in England given) or cost of 160g in England, ÷ 1000 × 160 (cost of 160g in Switzerland given) or cost per gram in each country, ÷ 160 and ÷ 1000 or cost of 800g in each country M1 for converting £ to Swiss francs or Swiss francs to £ (other than £1=1.65 SFr) A1 for two correct values (using same units) for comparison C1 for Country identified from a clear attempt to use comparable weights and prices. QWC: Decision must be stated, with calculations clearly attributable