

Mark Scheme (Results)

November 2011

Applications of Mathematics (GCSE)
Unit 1: 5AM1F_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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

5AM1F_01					
Question		Working	Answer	Mark	Notes
1	(a)		8900	1	B1 for 8900 (accept in words)
	(b)		29 000	1	B1 for 29000 (accept in words)
2	(a)		-10	1	B1cao
	(b)		24° indicated	1	B1 for 24° marked ($\pm 1^\circ$) (accept any clear indication)
	(c)		75 km/h indicated	1	B1 for 75 km/h marked (± 2.5 km/h) (accept any clear indication)
3		7.35 – 4.5 2.85 × 1000	2850	3	M1 for 7.35 – 4.5 or 2.85 seen or digits 285 M1 for “2.85” × 1000 A1 ft OR M1 for 4.5 × 1000 or 7.35 × 1000 or 4500 or 7350 M1 for “7350” – “4500” A1 ft
4	(a)		5	1	B1cao
	(b)		Thursday	1	B1 for Thursday (accept incorrect spelling)
	(c)		52	2	M1 for attempt to add frequencies (condone 1 incorrect) A1 ft
	(d)	5+7+11+13+16	increases	1	B1 for description of change, eg the absences increase, goes up (accept change of 11)

5AM1F_01				
Question	Working	Answer	Mark	Notes
5	200 – 50 150 ÷ 12	12.50	4	M1 for 200 – 50 or 150 seen M1 for “200 – 50” ÷ 12 A1 for 12.5(0) B1 for correct money notation
6	(a)	1, 0, 1	2	B2 for all 3 correct answers (B1 for 1 or 2 correct answers)
	(b)(i)	correct symbol ticked	2	B1 for tick under second symbol
	(ii)	3		B1 for 3 (SC B1 for (ii) if the first or third symbol is ticked in (i) and order 1 given in (ii))
7	(a)	correct arrangement shown	2	B2 twelve stones shown in a rectangle (ok if pond in the middle) or a rectangle with correctly labelled sides (B1 for rectangle drawn or 12 stones used)
	(b)(i)	10	3	B1cao
	(ii)	14m ²		B1 for 14 B1 for m ²
*8		diagram or chart	4	B1 for suitable labels or key to differentiate women and men B1 for Protein, Fat, Fibre and Salt clearly labelled B1 for accurately representing the data – bars of correct height C1 (dep on B2) for fully correct diagram or chart

5AM1F_01				
Question	Working	Answer	Mark	Notes
*9	$4.9 + 5.5 + 9.2 + 66.5 + 21.7$ $4.8 + 5.2 + 8.8 + 67.7 + 22.1$ $- 0.1 + - 0.3 + - 0.4 + 1.2 + 0.4$	2006	3	M1 for $4.9 + 5.5 + 9.2 + 66.5 + 21.7$ or $4.8 + 5.2 + 8.8 + 67.7 + 22.1$ A1 for 107.8 and 108.6 C1 (dep on M1) for correct conclusion that more passengers used the airports in 2006 and a clear comparison of the figures to reach the conclusion. OR M1 for attempt to find the differences each year and total A1 for 0.8 or $- 0.8$ C1 (dep on M1) for correct conclusion that more passengers used the airports in 2006 and a clear comparison of the figures to reach the conclusion.
10	(a) (b) (c) $294 + 312$	433 Tours 606	1 1 2	B1 cao B1 cao M1 for $294+312$ or one of 294 and 312 seen in the addition of only two distances A1 cao

5AM1F_01					
Question		Working	Answer	Mark	Notes
11	(a)		8.45pm	2	M1 for attempt to subtract 15 or 30 minutes from 9 30 or 9 15 seen or 9 00 seen A1 for 8 45 (pm)
	(b)	$2 \times \text{£}3.30 + \text{£}2.50$ $\text{£}20 - \text{£}9.10$	10.90	3	M1 for $2 \times 3.30 + 2.50$ M1 (dep) for $20 - \text{"9.10"}$ A1 cao OR M1 for $20 - 3.30$ or $20 - 2.50$ M1 for $20 - 3.30 - 3.30 - 2.50$ oe A1 cao
	(c)	9 30 to 6 00 = 3.5 hours $3.5 \times 5 = 17.5$ hours per week $17.5 \times 6.8 = \text{£}119$ 8 30 to 12 30 = 4 hours 1 30 to 5 30 = 4 hours $8 \times 2 = 16$ hours per weekend $16 \times 7.50 = \text{£}120$	Patrick	5	M1 3.5 or 8 or 4 M1 3.5×5 or 17.5 or 16 or 8×2 M1 " 17.5×6.8 " or " 16 " $\times 7.5$ or 119 or 120 A1 119 and 120 C1 (dep on M1) correct based on their answers

5AM1F_01					
Question		Working	Answer	Mark	Notes
12	(a)		April	1	B1 cao
	(b)		5	1	B1 cao
	(c)(i)		4.50 3.49 5.95 19.42	6	B1 cao for each of the first three entries. B1 ft for total
	(ii)	28×65	Cheaper to buy		M1 for 28×65 A1 ft for £18.20 and correct conclusion Or M1 “19.42” \div 28 or digits 69 seen A1 ft £0.69 and correct conclusion
13	(a)	$30 \times 4 + 160$	280	2	M1 for 30×4 or 120 seen A1 cao
	(b)	$356 - 20$ $336 \div 8$	42	3	M1 for subtraction of 20 M1(dep) for divide by 8 A1 cao OR M1 for $8 \times "n" + 20 = 356$ M1 for attempt to subtract 20 from each side or divide each side by 8 A1 cao
	(c)	$4n + 160 = 8n + 20$ $8n - 4n = 160 - 20$ $4n = 140$ $n = 140 \div 4$	35	4	M1 for $4n + 160$ or $8n + 20$ seen M1 for $4n + 160 = 8n + 20$ M1 for clear correct method to isolate terms in n isolate number terms on opposite sides of a four term equation eg. $8n - 4n = 160 - 20$ A1 cao

5AM1F_01				
Question	Working	Answer	Mark	Notes
14	$360 \div 40 = 9$ $25 \times 9 = 225$ $11 \times 9 = 99$ $4 \times 9 = 36$	angles of 255° , 99° , 36°	4	M1 for $360 \div 40$ A2 for all 3 sectors correct (A1 for 1 sector or value correct) B1 for correct labelling
15	(i)	187.50	2	B1 for $W = 187.5(0)$
	(ii)	37.50		B1 for $S = 37.5(0)$
16	(a)	38	2	M1 for adding the percentages or 62 seen A1 cao
	(b)	Katie spends more	3	M1 for $\frac{48.45}{425} \times 100$ A1 for 11.4 C1 (dep on M1) for conclusion ft from comparison of two percentages OR M1 for $\frac{11}{100} \times 425$ or for $10\% = 42.5(0)$, $1\% = 4.25$, $42.5(0) + 4.25$ A1 for 46.75 C1 (dep on M1) for correct ft from comparison of "46.75" and 48.45
	Or			
	$\frac{11}{100} \times 425 = 46.75$			

5AM1F_01						
Question	Working	Answer			Mark	Notes
17	(a)				3	B3 cao (B2 for 6 - 11 correct entries in figures or tallies) B1 for 2 - 5 correct entries in figures or tallies) (If B0 scored, allow SC B1 for correct totals for their table)
	(b)				2	M1 for "3" from table A1 for 15% or $\frac{3}{20}$ or ft from table (accept ratio) 0.15
	$\frac{3}{20} \times 100$		15%			

5AM1F_01				
Question	Working	Answer	Mark	Notes
18	(a) $2x + 3x + 3x = 360$ $8x = 360$	45	2	M1 for $2x + 3x + 3x = 360$ or $360 \div 8$ ie complete method A1 cao.
	(b)(i) $3y + 20 + 2y + y + 10$	$6y + 30$	4	M1 for $3y + 20 + 2y + y + 10$ A1 for $6y + 30 (=180)$
	(ii) $6y + 30 = 180$ $y = (180 - 30) \div 6$	25		M1 for “ $6y + 30$ ” = 180 or correct sequence of operations using “ $6y + 30$ ” and 180 A1 ft on an equation of the form $ay + b = 180$ T&I B2 for 25, B0 otherwise
19	$\frac{5}{100} \times 208$ $208 + 10.40$ 1.05×208	218.40	3	M1 for 0.05×280 or $10.4(0)$ M1(dep) for $208 + “10.40”$ A1 for 218.40 OR M2 for 1.05×208 oe A1 for 218.40
20	(a)	28g butter 14g flour 142ml milk 84g cheese	2	M1 for use of 1 ounce = 28g or 1 pint= 568ml (may be implied by at least 2 correct quantities) A1 cao
	(b) 12×142	1.704	2	M1 for $12 \times “142”$ or sight of figures 1704 A1 ft (accept 1.7, 1.70)

5AM1F_01					
Question		Working	Answer	Mark	Notes
21	(a)		Point plotted	1	B1 for plotting (10, 19) tol ± 1 sq
	(b)		Line of best fit	1	B1 for a straight line passing between (1, 4) and (1, 8) and between (17, 24) and (17, 28)
	(c)		Relationship described	1	B1 for 'as the number of years they have done their job increases, so does their (hourly) pay' oe Or B1 'positive correlation' oe
22		6×4.5 $27 \div 1.44$ $19 \times \text{£}12.87$	£244.53	4	M1 for 6×4.5 M1 for " 6×4.5 " $\div 1.44$ M1 for " 19 " $\times \text{£}12.87$ A1 cao

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