



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme

June 2003

GCSE

Statistics

3311

Foundation

Copyright © 2003 AQA and its licensors. All rights reserved.

Notes for Examiners


In general if a response is fully correct then it is sufficient to tick the final answer and put the mark for that part in the margin. Parts not attempted or totally incorrect must have 0 for that part in the margin. Negative marks must not be used.

Errors **must** be underlined or ringed.

Responses that are partly correct will generally be awarded marks for method or partial working. In that case the following should appear in the margin to indicate what the mark(s) has been awarded for. These are detailed in the mark scheme.

- M** Method marks are awarded for a correct method which could lead to a correct answer.
- A** Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
- B** Marks awarded independent of method.
- M dep**
or DM A method mark dependent on a previous method mark being awarded.
- B dep**
or DB A mark that can only be awarded if a previous independent mark has been awarded.
- ft** Follow through marks. Marks awarded following a mistake in an earlier step.
- SC** Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.

Within the script the following notations can be used to explain the decision further. These should appear next to the place in the script where the error or omission is made.

- ft**
or  Follow through marks. Wrong working should not be penalised more than once so that positive achievement later in the question can be recognised.



An answer that does not follow through from previous working.

- MR**
or MC Misread or miscopy. Candidates often copy values from a question incorrectly. If the examiner thinks that the candidate has made a genuine misread, then only the accuracy marks (A or B marks), up

to a maximum of 2 marks are penalised. The method marks can still be awarded.

- fw** Further work. Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.
- Choice** When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.
- wnr** Work not replaced. Erased or crossed out work that is still legible can be marked.
- wr** Work replaced. Erased or crossed out work that has been replaced is not awarded marks.
- ^** Work incomplete or method missing.
- allow** In general decisions should support the candidate. If an examiner feels that work is worthy of a mark then it can be allowed.
- BOD** Benefit of the doubt should only be given in cases where evidence is not secure. For example overwriting numbers. It should not be used to avoid making a decision. Examiners are expected to make decisions based on the scheme.
- seen** Every page containing working should be annotated to show it has
or ✓ been considered.
- From** Marks transferred from another part of the paper. Candidates often
page make a mistake in their original work and do the question on the
23 ↘ back page or another page with some space. The part marks should be credited there **within the script** and the marks transferred to the margin by the printed question.
- Wrong** Candidates sometimes obtain the correct answer via a completely
method wrong method. If an examiner is sure that this is the case then the method mark should not be awarded and subsequently the accuracy mark cannot be awarded. This notation should also be used when candidates ‘fiddle’ algebra to demonstrate a given result.
- pa** Premature approximation. Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise at the standardisation meeting.

Unusual responses

Very occasionally situations may occur which are not covered by the above notations. In these rare cases examiners should write brief comments in the script to explain their decision, such as ignore, irrelevant etc.

Blank answer spaces and blank pages

Blank answer spaces should be crossed through to show that they have been seen. Blank pages at the end of a paper should also be crossed through to indicate that they have been seen. Any working on these pages must be marked.

Diagrams

Diagrams that have working on them should be treated like normal responses and marked with same notations as above. If the diagram is written on but the correct response is within the answer space the work within the answer space should be marked and the diagram ticked to indicate that the examiner has seen it. Working on diagrams that contradicts work within the answer space is **not** to be considered as choice but as working.

Responses which appear to come from incorrect methods.

Whenever there is doubt as to whether a candidate has used an incorrect method to obtain an answer, as a general principle the benefit of doubt must be given to the candidate. In cases where there is no doubt that the answer has come from incorrect working then the candidate should be penalised as directed at the standardising meeting.

Questions which ask candidates to show working

Instructions on marking will be given at the standardising meeting but usually marks are not be awarded to candidates who show no working

Questions which do not ask candidates to show working

As a general principle a correct response is awarded full marks.

Probability

Answers should be written as fractions, decimals or percentages. If a candidate uses an incorrect notation such as '1 out of 4' for $\frac{1}{4}$ consistently through the paper, then penalise the first occurrence but allow any following answers. Ratio is not acceptable as incorrect notation.

Recording Marks

Part marks for a question should be shown in the margin at the side of the work. The totals should be shown in the oval either at the end of each question or after each double page. These marks should be transferred to the appropriate box on the front of the paper. The grand total for the paper should also be shown in the appropriate box on the front of the paper. This total should agree with the total of the part marks within the paper.

Checkers at the board will first check that the part marks agree with the ringed totals, either at the end of each question or after each double page. They will then check that these marks have been transferred correctly and finally that the total on the front cover is correct. Papers that contain clerical errors may be returned to examiners.

Tier F

1 (a)	80	B1	
(b)	50	B1	
(c)	3 Shapes	B1	
(d)	$80 + \dots$ $= 190$	M1 A1✓	
	Total	5	

2 (a)	Entries	B3	1 mark per correct entry
(b)	8 25 12 45	B4	All correct
	58 27 30 115		4 Correct for 3 marks
	66 52 42 160		3 Correct for 2 marks
			2 Correct for 1 mark
	Total	7	

3	(i) Memory or no boxes	B1	May not listen / difficult to remember / not precise
	(ii) Personal	B1	Ambiguous boxes
	(iii) Leading	B1	
	Total	3	

4(a)	Heights	B2	-1 each independent error
	Labels	B1	
(b)	Increase in sales overall	B1	
	Cups reduced	B1	Or any of the other three increased
(c)	$\frac{10.2}{7.5} \times 100$	M1 M1	For "2001 / 1995" For $\times 100$ independent
	$= 136$	A1	1.36 give B1, 36% or 36 give B1
	Total	8	

5(a)	$\frac{129}{12027} \times 1000$	B2	B1 for correct fraction B1 for $\times 1000$
	$= 10.7$		
(b)	$\frac{241}{12027} \times 1000$	M1	
	$= 20.0$	A1	Accept 20
(c)	Greenfield	B1	With a reason

	Higher birth rate lower death rate	B1	More born than die If the answer is 2 for part (b) then Longtown with reference to rates can get B2
	Total	6	

6(a)	Positive	B1	
(b)	Negative	B1	
	Total	2	

7(a)	1.8 + 1	M1	
	= 2.8	A1	
(b)	1999 Q_4	B1	
(c)	(i) Warwick (Castle)	B2	B1 evidence of some subtractions inc Warwick Castle B1 for either 148 or 148k
	(ii) $\frac{148}{637} \times 100 = 23.2$	M1 M1 A1	Follow through on increasing sites, M2 A1 Follow through on decreasing sites, M1 A1 Answers to 3 s.f. For the three increasing sites, T L is 3.79, L C is 5.18, T B is 1.65 For the three decreasing sites, S H is 12.9, V is 7.2, F A is 10.3
	(iii) Offers, additions to site, Marketing/promotion o.e	B1	Weather; do not accept longer holidays or increase in population
(d)	Improves response rate	B1	
	Cost/time	B1	Any reference to time either respondent or questioner acceptable or possible embarrassment
	Total	11	

		D E F H		
8 (a)	Maths	49 58 68 76	B3	If all correct
	Physics	53 42 22 53		3 pairs correct for 2 marks
				2 pairs correct for 1 mark
(b)	Line positive + through \bar{x}, \bar{y}		B1	
	Length at least 23 – 78 And passing between A,B & J, H		B1	
(c)	Estimate approx 67		B1√	Follow through on positive line

(d)	Extremely good at maths Poor at physics	B1	Must be both
	Total	7	

9(a)	$\frac{6}{20}$ o.e	B1	
(b)	$\frac{5}{19}$ or 0.263	B1	
(c)	$\frac{6}{20}, \frac{5}{19}$	B1	Not follow through
	$\frac{14}{19}$	B1	
(d)	$\frac{6}{20} \times \frac{5}{19}$ (i) $= \frac{3}{38}$	M1 A1 \checkmark	Their (a) x their (b) or from the tree
	$\frac{3}{38} + \frac{91}{190}$ (ii) $= \frac{53}{95}$	M1 M1 A1	14/20 x 13/19 for M1 M1 dependent for (d) (i) + (a) (i) f.t
	$1 - \left(\frac{53}{95}\right)$ (iii) $= \frac{42}{95}$	M1 A1 \checkmark	14/20 x 6/19 + (their (a) x 1 – their (b))
(e)	(i) Zero	B1	Want numbers, accept 0/14
	(ii) One	B1	Want numbers, accept 14/14
	Total	13	

10 (a)	(i) 41 yrs	B1	41 or 71 accept
	(ii) Women live longer	B1	
(b)	Improvements in health care o.e	B1	
(c)	(i) At age 1, live 3 years longer	B1	Accept live longer
	(ii) High proportion of deaths at birth	B1	Not follow through, not specific illnesses
	Total	5	

11(a)	£ 52,000	B1	
(b)	(i) $\frac{588600}{9}$ $= £65,400$	M1 A1	An attempt at total $\div 9$
	(ii) Influenced by extremes	B1	Mention 129500 acceptable

(c)	(i) Continuous	B1	
	(ii) Discrete	B1	
	(iii) Qualitative	B1	
(d)	(i) Number population	B1	Or a list implied
	Fraction i.e. 1 in 10	B1	B2 for drawing names from hat
	Random selection	B1	B1 for sample fraction Systematic sample possible B2
	(ii) non random : biased	B1	See end of document
	Non representative i.e. maybe all of one type e.g. teachers	B1	
	Total	12	

12(a)	$\frac{35}{360} \times 100$ $= 9.72\%$	M1 A1	Accept 1 d.p. but not 9.73
(b)	Angle 70°	B1	May be on diagram and accept 70%
	$\frac{70}{360} \times 468$ $= 91$	M1 A1	89 without method = 0 89 with working = M1 A0
	Total	5	

13(a)	$\frac{5}{56}$	B1	
(b)	$\frac{13}{56}$	B1	
(c)	$\frac{5}{13}$	B1 B1	Must be a probability
(d)	$\frac{13}{56}$	M1	
	$\times \frac{12}{55}$	M1	Not dependent
	$0.0506 \left(= \frac{39}{770} \right)$	A1	
	Total	7	

14 (a)	Stem	B1	
	Leaves	B1	
	Order	B1	
(b)	Median = 72	B1	

	Lower quartile = 68	B1	Accept: 68 68.25 68.25 (Must be consistent pairs)
	Upper quartile = 76	B1	75 75.25 75.75 Special case if quartiles correctly paired but reversed SC1
(c)	Median	B1	f.t. their (b)
	Quartiles	B1	f.t. their (b)
	Whiskers and box	B1	f.t. their (b)
	Total	9	