AQA

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark scheme
November 2003

GCSE

Mathematics A

Paper 1: Intermediate

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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 or ✓	Every page containing working should be annotated to show it has been considered.
from page 23 ↘	Marks transferred from another part of the paper. Candidates often make a mistake in their original work and do the question on the 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 method	Candidates sometimes obtain the correct answer via a completely 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 in the standardising 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 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.

Probabililty

Answers should be written as fractions, decimals or percentages. If a candidate uses an incorrect notation such as "1 out of 4" for ¼ 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.

1	28	B2	B1 36 and 64 identified

2	11	B1	
	−11	B1	

3	900 ÷ 25 or 90 ÷ 2.5	M1	or 900 × 5 or 90 × 5
	(their 36) × 5	M1 dep	or (their 4500) ÷ 25 or (their 450) ÷ 2.5
	180	A1	SC1 for full method with incorrect mm ↔ cm e.g. 90 ÷ 25 × 5 or 90 × 4 × 5 oe SC2 answer with incorrect mm ↔ cm e.g. 18 or 1800

4	Length 8 and width 5	B2	allow 8 by 5 rectangle drawn or B1 rectangle with area 40 or B1 rectangle with perimeter 26 cm

5(a)	$y = -4$ drawn through three consecutive integer points	B1	
	$y = 2x + 1$ drawn within ½ small square of three consecutive integer points	B3	B2 any three correct coordinates plotted or any line with gradient 2 B1 any two correct coordinates calculated or any line passing through (0, 1)
(b)	(–2.5, –4)	B1ft	ft intersecting lines below x-axis

6	5 × 5 or 3 × 3	M1	
	5 × 5 – 3 × 3	M1	or 9 ÷ 25 × 100 or 9 × 4 oe
	(their 16) ÷ (their 25) × 100 oe	M1dep	or 16 × 4 or 100 – 36
	64	A1	SC3 36

7(a)(i)	40	B1	
(ii)	51	B1	
(iii)	48	B1	
7(b) (i)	Two-way table gender/food. E.g. Healthy | Normal | (Both) Boys Girls Or two-way table linked to question about hypothesis. E.g. Do you eat healthy food? Yes | No Boys Girls	B2	B1 Other table gender/food. E.g. Gender Apples Carrots Salad Boy | Healthy Y/N | Girl | Healthy Y/N
(ii)	Yes and correct comparison between relative frequencies oe. E.g. $(^{12}/_{20}) = {}^{18}/_{30}$ or $^{36}/_{60}$ or 60% or 0.6 $> (^{13}/_{30}) = {}^{26}/_{60}$ or 43.3% or 0.43 … < ½ the boys, > ½ the girls You would get 18 healthy eaters if there were 30 girls	B2	B1 Yes and imprecise attempt to compare relative frequencies oe. E.g. Only 20 girls gives nearly the same as 30 boys There are 10 less girls but just 1 less healthy eater

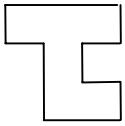
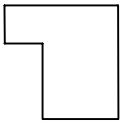
8	*C* marked within limits of loci	B3	B1 bearing from $A \pm 2^o$ B1 bearing from $B \pm 2^o$

9	$a = 50$	B1	
	$b = 70$	B1	

10(a)	180	B1	
(b)	2000	B1	
(c)	4320	B1	
(d)	$3000 \div (20 \times 50)$ oe	M1	For any 2 valid approximations from 3000, 20, 50
	3	A1	M0A0 wrong or missing method

11(a)	64	B1	
(b)	–10 and 12 seen	M1	
	2	A1	
(c)	$5p$ or $5 \times p$ or $p \times 5$ and/or $2q$ or $2 \times q$ or $q \times 2$ seen	M1	or $p5 + q2$
	$5p + 2q$ oe	A1	or $5 \times p + 2 \times q$ or $p \times 5 + q \times 2$ fw e.g. $5p + 2q = 7pq$ M1A0

12(a)	Full explanation. E.g. O – 1 is always E <u>and</u> E + E is always E, or E + O is always O <u>and</u> O – 1 is always E	B2	B1 one or more examples with conclusion, or, O – 1 is always E, or, E + E is always E, or, E + O is always O
(b)	2 identified as even prime	B1	E.g. O + E – 1 is always E and 2 is an even prime E.g. 1 + 2 – 1 = 2

13		B2	B1 one incorrect square (extra, missing, misplaced) 

14	Any rotation	B1	
	90^o clockwise rotation	B1	allow 90^o anticlockwise rotation about O (–2, 1), (–5, 1), (–2, 3)
	Fully correct	B1	(2, –1), (5, –1), (2, –3)

15(a) (i)	$^{153}/_{300}$ or $^{51}/_{100}$ or 51% or 0.51	B1	
(ii)	<u>Fair</u> and full <u>numerical</u> comparison between predicted and actual. E.g. <u>two</u> of: $^3/_6$ of 300 (= 150) is close to 153 $^2/_6$ of 300 (= 100) is close to 98 $^1/_6$ of 300 (= 50) is close to 49 oe	B2	B1 <u>fair</u> and incomplete <u>numerical</u> comparison e.g comparison for red only
(b)	Not enough trials oe	B1	accept reason based on "chance" oe

16(a)	13 + 4 or diagram 4 drawn	M1	oe
	21	A1	
(b)	$4n + 1$	B2	B1 for $4n$ + c or $n4 + 1$ B0 for $n4$ + c unless notation already penalised in 11(c) fw ignore iff numerical term fw deduct B1 iff incorrect algebra
(c)	$4n + 1 = 201$ or $(201 – 1)$	M1	ft their (a) for M marks (not $n + 4$)
	$4n = 200$ or $201 \div 4$	M1	Accept reasonable attempt at complete build up method for M2
	50	A1	

17(a)	5	B1	
(b)	3×25 or 5×15	M1	3 and 5 seen on answer line
	$3 \times 5 \times 5$ or 3×5^2	A1	

18	34.5 and 35.5 or 25 and 35	M1	condone 35.4999 … and 34.999 …
	any value ≥ 34.5 and < 35	A1	allow 35

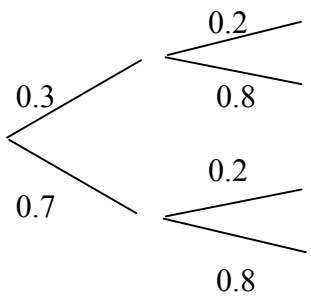
19	$x^2 – 2x – 3$	B2	B1 $x^2 – 3x + x – 3$ (any 3 out of 4 terms correct) or $x^2 \pm ?x – 3$ or $x^2 – 2x \pm ?$

20(a)	$0.5 \times (4 + 10) \times 4$	M1	oe
	28	A1	
(b)	$15 \times$ (their 28)	M1	
	(their 420) ÷ 100	M1dep	
	4.2	A1ft	ft $0.15 \times$ (their 28)

21(a)	80×1.75	M1	accept 80×1.45 and 80×105
	140	A1	
(b)	{190 – (their 140)} ÷ (2.25– 1.75)	M1	or (their 50) ÷ 0.5 allow (their 50) in 30 minutes
	100	A1ft	ft from their (a)

22(a)	2500×0.1 or 250 oe	M1	or 2500×1.1 or 2750
	2750×0.1 or 275 oe	M1	or 2750×1.1 M2 2500×1.1^2
	3025	A1	SC2 525 SC1 500 or 3000
(b)	$1320 \div 110$	M1	
	(their 12) $\times$ 100	M1	M2 $1320 \div 1.1$
	1200	A1	

23	$(\pi) \times \text{radius}^2 \times 3.2 = (320 \times (\pi))$	M1	
	$\text{radius}^2 = 100$	M1	oe
	10	A1	

24(a)		B1	
(b)	0.3×0.2	M1	oe
	0.06	A1	or $^6/_{100}$

25	4.5×10^6	B2	B1 4500000 or 45×10^5 oe *or* 4.5^6 *or* *4.5 6*

26(a)(i)	$(x - 8)(x + 1)$	B2	B1 $(x \pm 8)(x \pm 1)$
(ii)	8 and –1	B1ft	
(b)	$15x + 9y = 39$ or $25x + 15y = 65$ and and $15x + 25y = 15$ $9x + 15y = 9$	M1	allow a total of 1 error in either 1st or 2nd M mark
	$16y = -24$ or $16x = 56$	M1	
	$y = -1.5$ or $x = 3.5$	A1	
	$x = 3.5$ and $y = -1.5$	A1	accept $y = -24/16$ and $x = 56/16$ SC1 correct answers with no working or using T&I

27(a)	100	B1	
(b)	130	B1	
(c)	70 seen	B1	
	Full explanation. E.g 180 – (90 + 20)	B1	Minimum requirement 90 – 20