



General Certificate of Secondary Education

Mathematics 4302 (Two Tier) *Specification B*

Module 1 Higher Tier

Mark Scheme

2006 examination – November series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

The following abbreviations are used on the mark scheme:

M	Method marks awarded for a correct method.
A	Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.
B	Marks awarded independent of method.
M dep awarded.	A method mark which is dependent on a previous method mark being awarded.
ft an	Follow through marks. Marks awarded for correct working following a mistake in earlier step.
SC	Special Case. Marks awarded for a common misinterpretation which has some mathematical worth.
oe	Or equivalent.
eeoo	Each error or omission.

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Note: Probability - Accept fraction, decimal or percentage. Do not accept ratio.

1 out of 3 or 1 in 3 penalise once on whole paper.

Q	Answers	Mark	Comments
1(a)	0.25 + 0.15	M1	
	0.4	A1	
1(b)	$1 - (0.5 + 0.25 + 0.15)$	M1	or $1 - (0.5 + \text{"(a)"})$
	0.1	A1ft	ft probability in (a); answer must be a probability 0.10% SC1
2(a)	2000	B1	
2(b)	52(%)	B2	152 B1 51 SC1 151 B0
3(a)	5 to less than 10	B1	Accept 5 – 10 etc
3(b)	58, 74, 89, 100	B1	
3(c)	Plotting at UCB's	B1	(c) and (d) of this question must be an increasing function
	Their heights $\pm \frac{1}{2}$ square	B1ft	
	Joined by lines or curve	B1ft	Ignore before first plotted point (5,17) and after last plotted point
3(d)	100 – their reading at 17	M1	$\pm \frac{1}{2}$ square
	About "36"	A1ft	
4	$\frac{680}{(240 + 680 + 150)} \times 50$	M1	$\frac{50}{\left(\frac{1070}{680}\right)}$ or %
	31.7...	A1	or 31.8
	32 (nearest integer)	A1	32 alone 3 marks 31 alone 0 marks

Q	Answers	Mark	Comments
5	Recognise median cuts the data in half (areas in half) Median position = $\frac{160}{2} = 80^{\text{th}}$ 80 seen	M1	Also accept 80.5th or half of total area = 40 cm^2 40 seen
	$8 + \frac{24}{32} \times 4$	M1	or $12 - \frac{8}{32} \times 4$ or $8 + \frac{24.5}{32} \times 4$ or $12 - \frac{8.5}{32} \times 4$
	= 11	A1	or 11.0625 or 10.9375 (or 11.1 or 10.9 from this working seen)
6(a)	8 points correct $\pm \frac{1}{2}$ square	B2	6 or 7 points correct, ignore extras B1
6(b)	Sensible “straight” line	B1	On or below (40, 2.5) and on or between (50, 3.7) and (52, 3.5) and also on or between (56, 4.5) and (57, 4.2) 40-58 length
6(c)	The weight of the babies increase as their lengths increase	B1	oe or positive correlation
6(d)	Approximately 4.2 (decimals)	B1ft	Must follow their “straight” line (with positive gradient) 48 –55 area (wherever it is)
6(e)	Biased sample eg, no girls	B1	oe Sample is too small or sample not random

Q	Answers	Mark	Comments
7(a)	Any correct fraction seen in (a)	M1	$\frac{x}{20}$ $\frac{3 \text{ or } 1}{10}$
	All six correct	A1	$\frac{3}{20}$ $\frac{6}{20}$ $\frac{3}{20}$ $\frac{2}{20}$ $\frac{3}{20}$ $\frac{3}{20}$
7(b)	2, because there are a lot more 2s than any other number	B1	oe
7(c)	Their rel. freq. for 4×100	M1	or scale up by a factor of 5
	10	A1	10 out of 100
8(a)	$\frac{7}{10}$	B1	
8(b)	$\frac{7}{10} \times \frac{7}{10}$	M1	
	$\frac{49}{100}$	A1	
9	Reading trend line at the appropriate position 72	B1	Trend line read half way between June and Sept 06 (may be seen in method below)
	$\frac{(79+70+48+x)}{4} = 72$	M1	oe allow MR 71 here
	91	A1	also allow 87 from MR 71 87 alone 2, 91 alone 3
10	$\frac{9}{19}$ idea of without replacement	M1	
	$\frac{10}{20} \times \frac{9}{19}$	M1	
	$\frac{9}{38}$	A1	oe SC1 $(\frac{10}{20})^2 = \frac{1}{4}$ fully correct