



# General Certificate of Secondary Education

## Mathematics 3302 *Specification B*

### *Module 1 Intermediate 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:**

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

## Module 1 Intermediate Tier

**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)	83	B1	
1(b)	$\frac{20+1}{2} = 10.5\text{th value}$	M1	or locating 65 <b>and</b> 67 or 5 <b>and</b> 7 or 5/7 on diagram
	66	A1	
2(a)	$0.25 + 0.15$	M1	
	0.4	A1	
2(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
3(a)	See at least 2 correct mid-points	B1	
	$fx$	M1	eg, $110 \times 18$ a product seen or any value in class $\times$ class frequency
	$\frac{\sum fx}{\sum f} = \frac{"6640"}{50}$	M1dep	Adding four products and intending to divide their total by 50
	$= 132.8$	A1	Allow 133 after correct working 133 after no working SC2
3(b)	Mean time is quicker in March	B1	oe eg, they are getting fitter
	Range of times is wider in March	B1	oe

Q	Answers	Mark	Comments
4(a)	5 to less than 10	B1	Accept 5 – 10 etc Ignore 23s as well
4(b)	58, 74, 89, 100	B1	
4(c)	Plotting at UCBs	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
4(d)	100 – their reading at 17	M1	$\pm \frac{1}{2}$ square
	About “36”	A1ft	
5(a)	$\frac{320}{720} \times 360$	M1	Any correct method can be implied from pie chart
	160° or 125° or 75°	A1	Any correct angle can be implied from pie chart
	Sectors drawn $\pm 2^\circ$	A1	All 3 sectors correct, ‘straight’ lines
	Labels	B1	T, R, C in correct sectors according to size (only 3 sectors)
5(b)	You cannot answer negatively	B1	Too restrictive, suggestive Leading, biased Not enough categories Overlapping

Q	Answers	Mark	Comments
6(a)	8 points correct $\pm \frac{1}{2}$ square	B2	6 or 7 points correct B1
6(b)	Sensible “straight” line	B1	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 no individuals at all
6(d)	Approximately 4.2 (decimals)	B1ft	Must follow their “straight” line (with positive gradient) 48–55 area (wherever it is)

7(a)	Any correct fraction seen in (a)	M1	$\frac{x}{20} \quad \frac{3}{10} \quad \frac{1}{10}$
	All six correct	A1	$\frac{3}{20} \quad \frac{6}{20} \quad \frac{3}{20} \quad \frac{2}{20} \quad \frac{3}{20} \quad \frac{3}{20}$
7(b)	2, because there are a lot more 2s than any other number	B1	oe
7(c)	Their rel. freq. for $4 \times 100$	M1	or Scale up by a factor of 5
	10	A1	10 out of 100

8(a)	$\frac{7}{10}$ seen anywhere in part (a)	B1	
	All 6 correct probabilities on the first two sets of branches	B1	Ignore extra branches Ignore labels at this point
	Fully correct with labels	B1	No extra branches
8(b)	“ $\frac{7}{10}$ ” $\times$ “ $\frac{7}{10}$ ” unambiguous or clear	M1	Alternative $1 - \left[ \left( \frac{3}{10} \times \frac{3}{10} \right) + \left( \frac{3}{10} \times \frac{7}{10} \right) + \left( \frac{7}{10} \times \frac{3}{10} \right) \right]$ ”
	$\frac{49}{100}$	A1	