AQA

A S S E S S M E N T a n d
Q U A L I F I C A T I O N S
A L L I A N C E

General Certificate of Secondary Education

Mathematics 3302
Specification B

Module 1 Tier H 33001H

Mark Scheme

2005 examination – June 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.

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   A method mark which is dependent on a previous method mark being
            awarded.

ft   Follow through marks. Marks awarded for correct working following a
            mistake in an earlier step.

SC   Special Case. Marks awarded for a common misinterpretation which has
            some mathematical worth.

oe   Or equivalent.

eeoo   Each error or omission.

MODULE 1   HIGHER TIER   33001H

Note: Probability - Accept fraction, decimal or percentage. Do not accept ratio.
1 out of 3 or 1 in 3 penalise once on whole paper.

1(a)	0.4 + 0.2	M1	
	(=) 0.6	A1	
(b)	1 − (0.4 + 0.2 + 0.3)	M1	(Measure from diagram 36°
	(=) 0.1	A1	$\frac{36}{360}$ M1A1) $\frac{35}{360}$ M1 $\frac{36 \pm 2}{360}$ M1
(c)	0.4 + 0.3	M1	oe $0.4 \times 250 = (100)$ <u>or</u> $0.3 \times 250 = (75)$ $0.4 + 0.3 \times 250$ M1 no brackets
	(their) 0.7 × 250	M1 dep	Addition $0.4 \times 250 + 0.3 \times 250$
	(=) 175	A1	Penalise incorrect notation $\frac{175}{250}$ once on paper
			175 out of 250 OK

2(a)	Any correct <u>method</u> seen eg $\frac{(38+60)}{2}$	M1	$+11 \rightarrow 2$ answers correct Clear incorrect method → No marks
	48, 49, 51, 53 Mark boxes first	A1	May not be in boxes OK
(b)	Plotting the MA's at midpoints	B1	At least four
	Plotting at their correct heights	B1 ft	$\pm \frac{1}{2}$ sq ft boxes first or unambiguous working in (a) All 5 plots ± 2 cm translation 2 cm space Must be on the graph paper
(c)	Trend is increasing It's going up	B1	

3	$100 \times \frac{30}{500}$ or $\frac{500}{30} = 16.6$ $100 \div 16.6$	M1	Must use 16.6 or 16.7 or better
	(=) 6, 9.6, 3.9, 10.5	A1	All four correct decimals seen
	(=) 6, 10, 4, 10 or 6, 9, 4, 11	A1	Correct rounding to total 30
			6, 10, 3, 11 with no working scores SC1

4(a)	$\frac{1}{5} \times \frac{2}{7}$	M1	
	$= \frac{2}{35}$	A1	
(b)	(their (a) $\times$ 4) or $(\frac{1}{5} \times \frac{1}{7})$	M1	Either bracket, but (a) must be probability ≤ 0.25
	$((a) \times 4) + (\frac{1}{5} \times \frac{1}{7})$	M1 dep	
	$= \frac{9}{35}$	A1	oe 0.257... Accept 0.26 or better

5	0.22×200	M1	Alternative method $\frac{86}{200}$ or $= 0.43$ M1
	$= 44$	A1	$1 - ((\text{their}) 0.43 + 0.22) = 0.35$ M1
	$200 - ((\text{their}) 44 + 86)$	M1 dep	(their) 0.35×200 M1
	$= 70$	A1	$= 70$ Penalise incorrect notation $\frac{70}{200}$ once on paper A1
	Do not accept extra working $\frac{70}{2}$		

6(a)	0.3 and 0.7 correctly located on first pair of branches	B1		
	0.3 and 0.7 correctly located on both second pairs of branches	B1		
(b)	0.3×0.7	M1		
	$0.3 \times 0.7 + 0.7 \times 0.3$ adding exactly 2 correct products	M1	or $2 \times 0.3 \times 0.7$	ft if unambiguous
	$= 0.42$	A1	If no working in b) ans to b) could $\Rightarrow$ M1M1 from working shown in a) or $\Rightarrow$ M1 from working shown in a) Method must be shown or clearly implied	

7(a)	Any frequency density method correctly seen eg $3 \div 5$	M1	May be implied from correct bar on histogram
	4 or 5 frequency densities correct 0.6, 2.6, 5, 6, 1.6	A1	May be implied from 5 correct bars on histogram
	Histogram drawn accurately	A1	
(b)	$\left(\frac{1}{2} \times 26\right) + 25 + \left(\frac{2}{5} \times 30\right)$	M1	or $(5 \times 2.6) + 25 + (2 \times 6)$
	$= 50$	A1	
(c)	Range of Farland weights greater than range of Nearland weights	B1	eg The Farland boys' weights are more spread out or the Nearland boys' weights are more clustered or more consistent
	Mean or median of Farland weights is greater than the mean or median of the Nearland weights Need to mention "mean" "median" or "in general" OR Skewness: 'The Nearland boys' weights are negatively skewed whereas the Farland boys' weights are positively skewed	B1	eg The Farland boys' weights are **on average** heavier than the Nearland boys' weights or the Nearland boys' weights are **on average** not as much as the Farland boys' weights **Not** the Farland boys' weights are heavier

8	Using correct midpoints forming products and summing $30 + 20f + \ldots$	M1	At least two correct products summed Sight of 680 implies M1
	Obtaining the numerator "680" + 20f and correct denominator $20 + f$	M1	Both seen
	Setting up correct equation $\frac{"680" + 20f}{20 + f} = 30$	M1 dep	Depends on both M1s in any form (2nd M1 may be given here)
	$f = 8$	A1	May use trial and improvement => 4 marks