Version 1.0: 05:06

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Mathematics 3302
Specification B

Module 1 Tier H 33001H

Mark Scheme

2005 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	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)	Median is 60th item	M1	60.5 seen or 70 seen or 13 + 37 = 50
	$12 < t \leq 14$	A1	
1(b)	Sight of midpoints 11, 13, 15, 17	B1	All 4 seen (only 4)
	$(11 \times 21) + (13 \times 49)$ $+ (15 \times 37) + (17 \times 13)$ or 231 + 637 + 555 + 221	M1	Attempt at $\sum fx$ using x in or on the class boundaries (all 4 products)
	'1644' ÷ 120	M1 dep	Dep on M1
	= 13.7 accept 13 mins 40 secs	A1	Accept 14 from correct working
1(c)	90×15.8 or 1422	M1	
	('1422' + '1644') ÷ 210	M1	ft any mean in (a) or total in (a)
	= 14.6	A1	SC1 Fully correct method from 15.8 to 16 and/or 13.7 to 14

2(a)	$\frac{1}{6} \times \frac{1}{6}$ or $\frac{2}{6} \times \frac{2}{6}$ or $\frac{3}{6} \times \frac{3}{6}$	M1	
	$\frac{1}{36} + \frac{4}{36} + \frac{9}{36}$	M1	Adding the three correct products
	$= \frac{7}{18}$	A1	Accept 0.388 or 0.39 or 0.388(...) or $\frac{14}{36}$
2(b)	$\frac{2}{6} \times \frac{2}{6}$ or $\frac{4}{36}$	M1	Prob of 2 green
	$\frac{3}{6} \times \frac{1}{6}$ or $\frac{3}{36}$	M1	Prob of a red and a blue (either way)
	'$\frac{4}{36}$' $+ \frac{3}{36} \times 2$	M1	Adding correct products
	$\frac{5}{18}$	A1	Accept 0.277 or 0.28 or 0.277(...) or $\frac{10}{36}$

3	110 squares (little) or 1 square = 0.4 or 10 squares = 4	M1	Alternative method 4.4 cm^2 4, 4, 36 seen or 1 cm^2 = 10 members
	120 squares (≥ 55)	M1	4.8 cm^2 ≥ 55 32, 8, 8 seen
	$\frac{120}{110} \times 44$ or 120×0.4 or $\frac{120}{10} \times 4$	M1	$\frac{'4.8'}{'4.4'} \times 44$ or 4.8×10
	= 48	A1	= 48

4(a)	Positive	B1	
4(b)	No data around 15 Line may change/curve	B1	

5(a)	Plotting at correct midpoints	B1	All 4 $\pm \frac{1}{2}$ sq
	All heights correct within or on class boundaries and joined with 'straight' lines	B1	$\pm \frac{1}{2}$ sq
5(b)	On average the boys spend more time on the computer	B1	Comparison of average (in general) ie Boys mode or mean or median is higher than the girls
	Girls use it for max of 3 - 4 hours, boys goes up to more than 5 hours Boys spent longer than girls	B1	Comparison of spread ie Girls range is smaller than boys

6(a)	80 – 73, 72, 74 (71.5, 71, 72)	M1	Reading off and subtracting from 80
	= 7, 8 or 6 4, 3, 3.5 (with evidence)⇒M1A0	A1	Answer must be consistent with their graph. Must be integer Note: 57 – 50 = 7 !
6(b)	Median line at 37 (dot OK)	B1	$\pm \frac{1}{2}$ sq
	Quartiles at 30 and 44 <u>and</u> box formed	B1	$\pm \frac{1}{2}$ sq Top line on 3 cm box <u>must</u> be seen
	Whiskers joined to 17 and 57	B1	Accept 17 - 18 and 57 - 58 $\pm \frac{1}{2}$ sq

7(a)	Any one correct method shown eg $\frac{170}{500} \times 25$ or $\frac{170}{20}$	M1	$\frac{170}{\text{"400"}} \times 25 \Rightarrow$ M1 if 400 clearly their <u>total</u>
	Three correct decimals 8.5, 6, 10.5	A1	Only 8.5 or 10.5 ⇒ M1
	9, 6, 10 or 8, 6, 11	A1	
7(b)	Number each person and use ran button or draw names from a hat	B1	A suitable random sampling method explained. Note: answer of 'use random sampling' is not sufficient

8(a)	$\frac{1}{3} \times \frac{4}{5}$ or $\frac{2}{3} \times \frac{3}{10}$	M1	One correct product seen
	$\frac{1}{3} \times \frac{4}{5} + \frac{2}{3} \times \frac{3}{10}$ or $\frac{4}{15} + \frac{6}{30}$	M1	Both correct products added oe
	$= \frac{7}{15}$	A1	Note: $\frac{3}{10} + \frac{4}{5} \neq \frac{7}{15}$!
8(b)	$\frac{7}{15} \times N = 77$	M1	or $N = 77 \div \frac{7}{15}$ oe must be $0 \leq p \leq 1$
	$= 165$	A1	