ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark scheme
November 2002

GCSE

Mathematics B (Modular)

Module 1: Higher

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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.
cao	Correct answer only.
SC	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.

Higher Tier

Note: Probability: Accept fraction, decimal or percentage

eg 1 out of 36, 1 in 36 penalise first time throughout whole paper only. Do not accept ratio.

1(a)	Median is 14^{th} value	M1	Attempt to locate middle Accept 13.5 or 27 ÷ 2
	$80 < h \leq 100$	A1	Correct answer scores full marks
(b)	13 seen in (b)	B1	
	$\frac{13}{"27"} \times 70$	M1	Or 33.7 seen $\Rightarrow$ B1M1
	33 or 34	A1	Note 14 seen $\Rightarrow$ 36 or 37 SC1

2(a)	Median marked at 40 on boxplot	B1	
	Quartiles at 28 and 54 and box	B2	Plotting either quartile correctly B1
	Whiskers to extremes at 10 and 80	B1	$\pm \frac{1}{2}$ square throughout
(b)	26	B1	

3(a)	Using fd = freq ÷ class width correctly	M1	At least two correct fd's seen or correct method seen
	0.4, 0.4, 0.5, 0.1	A1	Or in these ratios
	Heights and widths plotted correctly	B1 ft	4 bars Heights ± ½ square for their vertical scale ft is on three correct values
(b)	$\frac{3}{4} \times 8 + 15$ or $(15 \times 0.4) + 15$	M1	
	= 21	A1	

4	0.5 × prob or 0.3 × prob or 0.2 × prob	M1	
	Second prob use of 9 in denominator	M1 dep	
	$\frac{5}{10}\times\frac{4}{9}$ or $\frac{3}{10}\times\frac{2}{9}$ or $\frac{2}{10}\times\frac{1}{9}$	A1	Or equivalent fractions eg $\frac{20}{90}$ etc
	$\frac{5}{10}\times\frac{4}{9} + \frac{3}{10}\times\frac{2}{9} + \frac{2}{10}\times\frac{1}{9}$	M1	Adding 3 correct products
	$\frac{28}{90}$ or 0.31…	A1	Or equivalent
			SC3 for fully correct using ratio throughout. Treat MR as A2 M1 using correct sample space diagram and M1 for denominator 90

5(a)	Negative	B1	
(b)	0, 1, 2	B1 ft	Must be an integer Round up or down
(c)	Have to extend line beyond given data	B1	Danger of extrapolation May curve after x = 6 No data near 8

6(a)	0.6×120	M1	
	= 72	A1	
(b)	"$\frac{1}{6}$" × "72" or "$\frac{1}{6}$" × their (a)	M1	Or equivalent, eg 0.6×20 '72' – ('36' + '24')
	= 12	A1	
(c)	$120 \times 0.25 \times \frac{1}{2}$	M1 M1 dep	One correct product or sight of 30 or 60 or 0.125 Second correct product
	= 15	A1	
(d)	P (yellow) = $\frac{1}{6} \Rightarrow$ 6 triangle cards	B1	Or 20 yellow cards
	Number of triangle cards ÷ 120	M1	Or 1 ÷ 20 yellow cards
	= $\frac{6}{120}$ or $\frac{1}{20}$	A1	

7(a)	Calculating 10%	M1	Any one correct decimal or integer
	16 X X X X 20 20 23 X 21	A1	Correctly rounding down
	X 19 20 20 19 X X X 22 X	A1	Correctly rounding up
(b)	A stratified sample will be <u>proportional</u> to all year groups and/or boys and girls A random sample could be biased in favour of boys or girls or year groups	B1 B1	Must say proportional to one item Takes a relative sample … B1 Must say biased to one item Cannot get both marks by implication
(c)	Part (a) gives 94 boys and 106 girls By gender 93 boys and 107 girls	B1 ft B1	Their row totals from (a) Part (a) gives one extra boy and one girl too few