

GCSE 2004

June Series



Mark Scheme

Mathematics B (3302)

Module 1 Tier H

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.

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Dr Michael Cresswell Director General

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.**

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

1	$(45 \times 9) + (55 \times 27) + (65 \times 21) + (75 \times 3)$	M1	Summing at least 3 correct products with at least 3 correct mid points
	'3480' \div 60	M1 dep	Must \div by 60
	= 58	A1	

2(a)	i) $(49 + 31 + 28) \div 3$	M1	Condone any missing brackets (\rightarrow 89.33) but must see method
	36	A1	
	ii) 39	B1	
(b)	(Term 2/02, 34) (Term 3/02, "36") (Term 1/03, "39")	B2 ft	All 3 B1 ft any $2 \pm \frac{1}{2}$ square
(c)	<u>Using</u> reading of "40" or "41"	M1	Must see line Must read at Term 2/03; or use seasonality method correctly
	$(28 + 58 + x) \div 3 = \text{"41"} \text{ (or "40")}$	M1 dep	From their trend line Condone missing brackets If working seen mark it
	Solving $x = \text{"37"} \text{ (or "34")}$ or "40" from 42 on trend line eg 43 \rightarrow 43 42 \rightarrow 40 41 \rightarrow 37 if no working shown 40 \rightarrow 34	A1 ft	Accept any alternative correct method which leads to a correct answer from their graph eg seasonality T 3/02 = "5" below trend ft M1 Locate trend at T 3/03 and M1 subtract = "44" - "5" = "39" A1 Line must reach and working seen

3(a)	$\frac{7}{11} \times \frac{6}{10}$	M1	
	$= \frac{42}{110}$	A1	oe ($= \frac{21}{55}$) (0.38 or better)
(b)	$\frac{4}{11} \times \frac{7}{10}$ or $\frac{7}{11} \times \frac{4}{10}$	M1 dep	One correct product
	$(\frac{4}{11} \times \frac{7}{10}) + (\frac{7}{11} \times \frac{4}{10})$	M1	or $\frac{4}{11} \times \frac{7}{10} \times 2$ oe
	$= \frac{56}{110} = \frac{28}{55}$	A1	oe (0.51 or better) 0.50 from 0.25×2 must see working
			Answers with replacement fully correct (a) $\frac{49}{121}$ and (b) $\frac{56}{121}$ scores SC2

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4	$2.8 \text{ cm}^2 = 42$ or $1 \text{ cm}^2 = 15$	M1	Linking up correctly oe eg counting small squares 70 small squares = 42 leaves
	Obtaining area of 4.2 cm^2	M1	Area correct Obtaining area of 105 small squares
	4.2×15	M1	Scaling up their area, good attempt at area $105 \times \frac{42}{70}$ or 105×0.6
	= 63	A1	
Alternative methods:			
<u>Method 1</u>			
Taking area of 1st block as 10×4 etc gives			
$10 \times 4 = 40$			
$5 \times 20 = 100$			
Total area of 140 represents 42			
$\frac{42}{140} = 0.3$ M1 for either $\frac{42}{140}$ or 0.3 or $\frac{140}{42} = \frac{10}{3}$ M1			
Area above 60 = $14 \times 15 = 210$ M1 area = 210 M1			
210×0.3 M1 $210 \div \frac{10}{3}$ M1			
= 63 A1 = 63 A1			
<u>Method 2</u>			
Using scale of 1 cm to 1 unit on vertical scale			
$10 \times 0.8 = 8$			
$5 \times 4 = 20$			
Total 28			
$\frac{42}{28}$ or 1.5 M1			
Area over 60 = $14 \times 3 = 42$ M1			
42×1.5 M1			
= 63 A1			
<u>Method 3</u>			
Using multiples of single lines of 5 small squares			
Area under 25 = 14 lines			
14 lines = 42			
1 line = $\frac{42}{14}$ or 3 M1			
Area over 60 = 21 lines M1			
21×3 or $21 \times \frac{42}{14}$ M1			
= 63 A1			

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5(a)	0.2, 0.35, 0.15, 0.3 or $\frac{4}{20}$, $\frac{7}{20}$, $\frac{3}{20}$, $\frac{6}{20}$	B2	2 or 3 correct B1 All 4 correct fractions in working with 4, 7, 3, 6 in table B1B0
(b)	$100 \times$ (their 0.35) Must be prob or (5×7)	M1	$\frac{35}{100}$ M1A0
	= 35	A1 ft	0.35 alone scores 0

6(a)	Median indicated at 48 on box plot	B1	$\pm \frac{1}{2}$ square throughout
	Quartiles at 32 and 62 and box	B2	B1 for 32 and 62 and no box B1 for 1 correct quartile and box Box freehand OK Mark box plot
	Whiskers at 4 and 82	B1	
(b)	Difference in median, spread or max value	B2	Any two valid differences comparing ages in the town and the village, one for location, one for spread eg skewness

7	Correct method seen for one value eg $\frac{318}{1000} \times 50$	M1	or $318 \div 20$
	$= \frac{15}{16}$ or $\frac{22}{23}$ or $\frac{11}{12}$	A1	
	Any two values correct	A1	
	All 3 values correct 16, 22, 12 15, 23, 12 16, 23, 11	A1	The three answers must total 50

8(a)	First set of branches correctly labelled with 6/not 6 and correct probabilities	B1	Or Bag A and Bag B labels as long as unambiguous or 2nd labels in outcome columns
	Second set - Bag A has probs red $\frac{3}{7}$, green $\frac{4}{7}$	B1 dep	Condone omission of labelling of bags if there is no ambiguity Must have R, G labels
	Second set - Bag B has probs red $\frac{2}{5}$, green $\frac{3}{5}$	B1 dep	Dependent upon correct true diagram structure $\begin{array}{c} < \\ < \\ < \end{array}$
(b)	$\frac{1}{6} \times \frac{3}{7}$ and $\frac{5}{6} \times \frac{2}{5}$	M1	oe ft if clearly unambiguous from correct structured tree diagram
	“ $\frac{1}{14}$ ” + “ $\frac{1}{3}$ ”	M1	
	$\frac{17}{42}$	A1	Accept $\frac{51}{126}$