GCSE 2004
June Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark Scheme

Mathematics B (3302)
Module 5 Paper 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.

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.

Further copies of this Mark Scheme are available from:

Publications Department, Aldon House, 39, Heald Grove, Rusholme, Manchester, M14 4NA
Tel: 0161 953 1170

or

download from the AQA website: www.aqa.org.uk

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales 3644723 and a registered charity number 1073334. Registered address AQA, Devas Street, Manchester. M15 6EX. *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 5 Paper 1 HIGHER TIER 33005/H1

1(a)	$3n - 1$	B2	oe B1 for any of the following: $3n$ (+c) n = × 3 – 1 nth = × 3 – 1 nth × 3 – 1 n3 – 1
(b)	Complete explanation eg 2, 5, 8… not multiples of 3 eg 98 and 101 are in the sequence eg $3n - 1 = 99$ does not give a whole number eg $n = 33.3…$ eg 100 is not a multiple of 3 eg 99 is a multiple of 3	B2	Part explanation B1 eg 101 is in the sequence eg 98 is the nearest SC1 for correctly using their answer from (a) provided linear but not $n + 3$

2(a)	Equal arcs from L and M	M1	Arcs greater than 0.5LM within 2 mm Must have two intersections
	Perpendicular drawn	A1	
(b)	Equidistant from 2 fixed points	B1	oe

3(a)	Trapezium	B1	
(b)	Rectangle	B1	
(c)	Rhombus	B1	

4(a)	5	B1	
	–3	B1	
(b)	Points plotted	B1 ft	$\pm \frac{1}{2}$ square
	Smooth curve	B1 ft	Through 6 points
(c)	i) Intersection with x axis	B1	
	ii) –0.2	B1 ft	$\pm \frac{1}{2}$ square

33005/H1

5(a)	$15^2 - 10^2$	M1	
	$225 - 100$	A1	
	$\sqrt{125}$ or $5\sqrt{5}$	A1	
(b)	Sight of tan	M1	Can be implied from table, 1.192 or 0.839
	$\tan 50 = \frac{DE}{10}$ or $\tan 40 = \frac{10}{DE}$	M1 dep	oe $\frac{DE}{\sin 50} = \frac{10}{\sin 40}$ scores M2
	11.92 or 11.9 or 12	A1	

6(a)	$180 - (90 + 25)$	M1	oe
	65	A1	
(b)	Implies or states that $C = 56$ or $BXA = 80$	M1	
	$180 - (80 + 56)$ or implies or states $A = 44$	M1 dep	
	44	A1	SC1 44 with no working shown

7(a)	$(x - 5)(x - 5)$ or $(x - 5)^2$	B2	B1 for any incorrect signs
(b)	$(2x + 5)(x - 1)$	B2	B1 for any incorrect signs

8	$4x - 10y = 18$	$20x + 15y = 25$ $6x - 15y = 27$	M1	Allow 1 error on any method for 1st M1 Substitution: eg $y = \frac{5-4x}{3}$
	$13y = -13$	$26x = 52$	M1 dep	Correct elimination from their equations Substitution: eg $2x - 5(\frac{5-4x}{3}) = 9$
	$y = -1$	$x = 2$	A1	
	$x = 2$	$y = -1$	B1 ft	ft on a correct given equation SC1 $x = 2, y = -1$ no working or trial and improvement

9(a)	$2 \times \pi \times 9$	M1	oe
	$\frac{80}{360} \times$ their $(2 \times \pi \times 9)$	M1	
	$4\pi + 18$	A1	oe

33005/H1

9(b)	$\pi \times 9^2$	M1	
	$\frac{80}{360} \times \pi \times 9^2$ or $\pi \times 9^2 \times 10$	M1 dep	
	180π	A1	oe Must see some correct simplification of $\frac{80}{360} \times \pi \times 9^2 \times 10$
	cm^3	B1	Units mark

10(a)	Correct sketch	B1	
(b)	Correct sketch	B1	
(c)	Correct sketch	B1	

11(a)	$\frac{1}{3} \times 10 \times 10 \times 12$	M1	
	400	A1	Accept 399.6 or better
	$\frac{1}{3} \times 5 \times 5 \times 6$ or 50 or $\frac{7}{8} \times 400$	M1	Allow 0.3(3)
	350	A1	Accept 349.6 or better
(b)	$\frac{350}{400}$ or their $\frac{350}{400}$	M1	Allow $\frac{1}{8}$ for M1
	$\frac{7}{8}$	A1	

12(a)	$3(x + 5)$ or $3x + 15$	B2	B1 for 3 B1 for $x + 5$ B1 for $\frac{6x+30}{2}$
(b)	$(x - 3)(x + 3)$	M1	
	$x(x + 3)$	M1	
	$\frac{x-3}{x}$	A1	Do not ignore further working

13	$\frac{1}{2} \times 6 \times 5 \times \sin 75$	M1	oe complete method
	14.49	A1	
	14 or 14.5	A1 ft	

33005/H1

14	$(3x + 2)(x + 1)$	M1	Rectangle
	$3x^2 + 5x + 2$	A1	
	$x \times 3x + 5(x + y)$ or $x \times 3x + x \times 5 + y \times 5$ or $x(3x + 5) + y \times 5$ or $(3x + 5)(x + y) - 3x \times y$	M1	L shape
	$3x^2 + 5x + 5y$	A1	
	$5y = 2$	M1 dep	oe dependent on a previous M1 and a term in y
	0.4	A1	oe

15(a)	$(a =)$ 3	B1	
	$(b =) -12$	B1	Allow 12 if –12 given in working
(b)	$(x + 3)^2 = 12$ or $(x =) \frac{-6 \pm \sqrt{6^2 - 4(1)(-3)}}{2}$	M1	Using their values from (a) Substitution into formula (allow 1 error)
	$x + 3 = \sqrt{12}$ or $(x =) \frac{-6 \pm \sqrt{36 + 12}}{2}$	M1 dep	Using their values from (a)
	$(x =)$ $\pm \sqrt{12} - 3$ or $\frac{-6 \pm \sqrt{48}}{2}$	A1	