AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Secondary Education

Mathematics 3302
Specification B

Module 5 Paper 2 Tier H   33005/H2
THREE TIER

Mark Scheme

2007 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.

Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

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   HIGHER TIER   33005/H2

1	Trial for $2 < x < 3$	B1	Correctly evaluated at least to the nearest whole number x $8x - x^3$ x $8x - x^3$ 2.1 7.539 2.6 3.224 2.2 6.952 2.7 1.917 2.3 6.233 2.8 0.448 2.4 5.376 2.9 −1.189 2.5 4.375
	Two trials for $2.35 \le x \le 2.5$ that "bracket" 5	B1	These trials correct or truncated to at least 1 dp x $8x - x^3$ x $8x - x^3$ 2.41 5.28… 2.46 4.79… 2.42 5.18… 2.47 4.69… 2.43 5.09… 2.48 4.58… 2.44 4.99… 2.49 4.48… 2.45 4.89…
	Trial at 2.44 or 2.45 and answer 2.4	B1	

2(a)	x^6	B1	
2(b)	y^5	B1	
2(c)	$6p^7q^4$	B2	−1 eeoo
2(d)	$8t + 4 - 3t + 9$	M1	Allow one wrong term
	$5t + 13$	A1	Penalise further working
2(e)	$w^2 - 2w + 4w - 8$	M1	Allow one wrong term
	$w^2 + 2w - 8$	A1	

3(a)	$\pi \times \left(\dfrac{9.2}{2} \right)^2$	M1	
	66.47…	A1	[66.4, 66.5]
3(b)	$\pi \times 9.2 \times 25 \ (= 722.5…)$	M1	
	their 722 + 2 (their 66.4)	M1	Need π in 3(a) and 3(b)
	855.5…	A1	[855, 856], 860

4(a)	$3n + 1$	B2	B1 for $3n$ seen
4(b)	their $(3n + 1) = 146$	M1	or $(146 - 1) \div 3$
	n not an integer	A1	oe
	Alternative method		
	Pattern 48 = 145 or	M1	
	Pattern 49 = 148		
	No total between 145 and 148	A1	oe

5	$6x - 15$	B1	
	$2x - 6x = -15 - 11$	M1	or $11 + 15 = 6x - 2x$
	6.5	A1	or $6\frac{1}{2}$

6(a)	2 correct lines	M1	± 2 mm
	(1, 3)	A1	
6(b)	Any 90º rotation	B1 ft	Look for PS & SR rotated
	Anticlockwise about S	B1 ft	
6(c)	(1, 6)	B1 ft	

7	Use of cosine	M1	
	$\cos N = \dfrac{14}{32}$ (= 0.4375)	M1	
	64.0(55…)	A1	[64, 64.1]

8	$12 \times \dfrac{5}{4}$	M1	
	15	A1	

9	Coefficients of x or y equalised	M1	$9x - 3y = 30$ seen or $12x + 9y = 27$ **and** $12x - 4y = 40$
	New equations added correctly	M1 dep	or subtracted correctly
	$x = 3,\ y = -1$	A1	

10	7 or 5	B1	May be seen on diagram
	$7^2 + 5^2 (= 74)$	M1	
	$\sqrt{}$ their 74	M1 dep	
	8.6(0……)	A1	
	8.60	B1	For any answer given to 2 dp

| 11 | $\dfrac{100}{360} \times 2\pi \times 5.2$ | M2 | or $2\pi \times 5.2 \ (= 32.6…)$ M1
$\div 360$ **and** $\times 100$ M1 |
| | 9.07… | A1 | [9.07, 9.1]
Area used   SC1 |

12(a)	$\dfrac{AB}{\sin 24} = \dfrac{17}{\sin 95}$	M1	
	$\dfrac{(17 \times \sin 24)}{\sin 95}$	M1	
	6.94…	A1	or 6.9 or 7
12(b)	$\dfrac{1}{2}$ (their 6.9) $\times 17 \times \sin 61$	M2	(their 6.9) $\times \sin 119 \ (= 6.0…)$ M1 $\dfrac{1}{2}$ (their 6.0) $\times 17$ M1 dep
	51.6…	A1	[51, 52]

13(a)	Pair of rectangles Correct products setup	M1	$3x \times 2x$ and $3 \times 2x$ or $5x \times 3$ and $3x \times (2x - 3)$ or $5x \times 2x$ and $2x \times (2x - 3)$ Brackets not necessary for this M1
	$6x^2 + 6x = 108$	M1	Allow one error provided quadratic form
	Correct simplification	A1	Must see evidence
13(b)	$\dfrac{-1 \pm \sqrt{1 - 4 \times 1 \times {}^- 18}}{2}$	M1 A1	M1 allow one error A1 for correct substitution
	3.77	A1	Ignore extra answer

14	$5(y + 2) + 6(2y + 3)$	M1	$= 17y + 28$
	$3(2y + 3)(y + 2)$	M1	Allow mark if 3 missing
	their $(17y + 28) =$ their $(6y^2 + 21y + 18)$	M1 dep	dep on both previous M1s
	$6y^2 + 4y - 10 = 0$	A1	or $3y^2 + 2y - 5 = 0$
	$(3y + 5)(y - 1)$	M1	
	$\dfrac{-5}{3}$ and 1	A1	Allow $\dfrac{-10}{6}$ and 1

15(a)	Graph A is $y = x^2 + 3$	B1	
	Graph B is $y = -3x^2$	B1	
15(b) (i)	Same curve lower down	B1	
15(b) (ii)	Reflection of curve in x-axis	B1	

16	tan 29	M1	
	TG = 50 × tan 29 (= 27.7…)	M1	
	$\dfrac{\tan x = \text{(their TG)}}{75}$	M1	
	20 to 20.3	A1	