AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Secondary Education

Mathematics 3302
Specification B

Module 5 Paper 2 Tier I   33005/I2
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.

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   INTERMEDIATE TIER   **33005/I2**

1(a)	360 – (90 + 77 + 62)	M1	oe Must be complete method
	131	A1	
1(b)	180 – 116 (= 64)	M1	May be seen on diagram or 116 ÷ 2 for M2
	[180 – their 64] ÷ 2	M1	
	58	A1	64 on answer line gets M1

2(a)	$\frac{5\times6}{2}$	B1	SC1 if "over 2" the only error in both parts
2(b)	$1 + 2 + 3 + 4 + 5 + 6 = \frac{6\times7}{2}$	B1	Mark as B0, SC1
2(c)	$\frac{24\times25}{2}$ (allow 24 × 25)	M1	No marks given for adding up $1 + 2 + \ldots$ etc
	300	A1	

3	16 × 28.33	M1	or 16 × 30
	$\frac{1}{2}$ kg = 500 g or 1 kg = 1000 g	M1	or 453.28 ÷ 1000 (= 0.453…)
	453 (.28) and yes	A1	or 480 and yes
	Alternative method		Alternative method
	1 kg = 2.2 1b oe	M1	500… M1
	16 oz = 1 lb	M1	500 ÷ 28.33 M1
	1 lb < 1.1 lb and yes	A1	17.6 and yes A1

4	Side 7 cm (in a triangle or quad)	B1	±2 mm
	Distance 5 cm (in a triangle or quad)	B1	±2 mm or 5 cm arc to find vertex
	Side parallel to base through vertex of triangle	B1	or side parallel to new 7 cm line ±2º
	Complete correct rhombus	B1	

5(a)	– 15 (+) 21	M1	
	6	A1	
5(b)	(+) 9 seen	M1	
	58	A1	
5(c)	$\frac{15}{-3}$	M1	
	–5	A1	

6(a)	$y + 5$	B1	oe $y + 5 = 5y$ B0	Penalise once only for a consistent change of letter
6(b)	$2y$ or $y + y$	B1	Allow $2 \times y$ or $y \times 2$ but not $y2$	
6(c)	y + their $(y + 5)$ + their $(2y)$	B1	Must be using one letter only	
6(d)	their (c) = 77	M1	Provided B1 earned in (c)	
	$4y = 77 - 5$ (or 72)	M1		
	18	A1	SC1: $y + 5 + 2y = 77 \Rightarrow 24$	

7(a)	$\pi \times 58$	M1	Allow $\frac{1}{2} \pi \times 58$ oe here
	182.2…	A1	[182, 182.22]
	105×2 + their 182	M1	dep on their 182 coming from a calculation involving π
	392.2…	A1	[392, 392.22]
7(b)	$\pi \times 62$ (= 194 to 195)	M1	Allow $\frac{1}{2} \pi \times 62$ oe here
	their 194.7 – their 182.2	M1 dep	or their 404.7 – their 392.2 or 528.7 – 508.2
	12.5…	A1	[12.5, 13] Answer 4π gets M2A0 Note: [20.5, 21] is evidence for M2

8	Fully correct enlargement in correct orientation	B2	B1 for 3 sides correct size ±2 mm
	From P as centre	B1	
			SC1: Correct enlargement with different orientation

9(a)	8 and 4	B1	
9(b)	Correct plots	B1	±1 mm May be implied by the line
	Joined by straight line from (0, 8) to (4, 0)	B1	Must go all the way and be ruled
9(c)	Line segment at least from (1, 3) to (2, 6)	B2	B1 for one correct plot
9(d)	(1.6, 4.8)	B1 ft	ft from their graphs provided they were straight lines and produce a non-integer value

10(a)	[(2 × 5 – 4)] × 90 ÷ 5	M1	oe 3Δs: 3 × 180 ÷ 5
	108	A1	108
	Alternative method		
	180 – (360 ÷ 5)	M1	
	108	A1	
10(b)	[(2 × 6 – 4)] × 90 ÷ 6 (= 120)	M1	oe 4Δs: 4 × 180 ÷ 6
	360 – (their 108 + their 120)	M1 dep	dep on M1 in previous line
	132	A1	
	Alternative method		
	or 360 ÷ 6 (= 60)	M1	360 ÷ 5 (= 72)
	their 72 + their 60	M1 dep	dep on M1 in previous line
	132	A1	

11	Trial for 2 < x < 3	B1	Correctly evaluated at least to the nearest whole number x 8x – x³ x 8x – x³ 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 ≤ x ≤ 2.5 that "bracket" 5	B1	These trials correct or truncated to at least 1 dp x 8x – x³ x 8x – x³ 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	

12(a)	x^6	B1	
12(b)	y^5	B1	
12(c)	$8t + 4 – 3t + 9$	M1	Allow one wrong term
	$5t + 13$	A1	Penalise further working

13(a)	$C - 3y$	M1	oe
	$\dfrac{C-3y}{5}$	A1	oe but $C - 3y \div 5$ is SC1
13(b)	$(32 - 3 \times 3.5) \div 5$	M1	oe ft their (a) for M1 only
	4.3	A1	

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

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

16	0.000 343	M1	May not be seen
	3.43×10^{-4}	A1	3.43 – 04 scores M1A0

17	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	