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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Mathematics 3302
Specification B

Module 5 Paper 2 Tier I 33005I2

Mark Scheme

2005 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.

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 2 INTERMEDIATE TIER 33005/I2

1(a)	$180 - 2 \times 67$	M1	or $(90 - 67) \times 2$
	46	A1	
(b)	$360 - (74 + 145 + 92)(= 49)$	M1	oe
	180 – (their) 49	M1 dep	
	131	A1	

2(a)	60° at *A* or 90° at *D*	B1	± 2°
	AB = 4 cm or *DC* = 5 cm	B1	± 2 mm
	ABCD fully correct	B1	
(b)	4.0 → 4.5 (cm)	M1	Check their diagram (± 2 mm) for M1A1 ft
	8.0 → 9.0	A1 ft	

3(a)	$x + 5$	B1	Consistent use of different letter is penalised once only
(b)	$x - 2$	B1	
(c)	$2x$	B1	Accept $x \times 2$, $2 \times x$, $x + x$ but not $x2$ In all Q3, allow eg "$x = x + 5$" and ignore stray units

4(a)	729	B1	
(b)	0.08	B1	Condone .08

5	$\pi \times 1.7^2$	M1	
	9.07 to 9.08	A1	or 9.1 but <u>not</u> 9.0 or 9 No working, answer 9... M1A0
	m^2	B1	UNITS MARK (can be awarded if seen in working)

6	$-10 + 1.8 \times 3.7$	M1	$-10 + 6.66$
	–3.34	A1	3.34 as answer but no working... M1A0

7	2 plots from: (0, 7) (1, 6) (2, 5) (3, 4) (4, 3) (5, 2) (6, 1) (7, 0)	B2	All ± 1 mm B1 for 1 correct plot
	Straight line (from 0 to 7) through correct plots ± 1 mm	B1	

8(a)	Any 90° rotation	B1	Allow wrong length flagpole
	Rotation 90° anti-clockwise about (0, 0)	B2	B1 for 90° clockwise rotation about (0, 0)
(b)	Correct position	B2	(1, 0) (1, –2) (1, –3) (2, –3) (2, –2) B1 for reflection in $x = 1$ or in $y = c$ Apply same scheme if flag A is used
	No label, or labelled incorrectly - correct positions to get full marks. No pole, but squares correct - deduct 1 in each part.		

9(a)	$4z = 11 + 5$ or 16	M1	
	4	A1	Allow embedded answer If contradiction M1A0
(b)	$7t - t$ or $6 + 3$	M1	
	$6t = 9$	M1	or $7t - t = 6 + 3$
	1.5 or $1\frac{1}{2}$ or $\frac{3}{2}$	A1	Allow embedded answer If contradiction M1A0
(c)	$3x + 6$	B1	
	$5x - 3x$ or $6 + 1$	M1	
	3.5 or $3\frac{1}{2}$ or $\frac{7}{2}$	A1	Allow embedded answer If contradiction M1A0

10(a)	20×22	M1	
	440	A1	
(b)	n squares across or $n + 2$ squares high	B1	n wide or n along $n + 2$ up or length $n + 2$
	$n(n + 2)$ for area	B1	Multiply them for area/total number of squares

11	$\pi \times 3.7^2$ (= 43.0...) or $2\pi \times 3.7^2$ (= 86.0...)	M1	or 42.9... or 85.9... If 43 multiplied by 5.7 at any stage... M0 unless also used as an add on
	$2\pi \times 3.7 \times 5.7$ (= 132.5...)	M1	or 132.4...
	2 (their 43.0) + (their 132.5)	M2 dep	M1 for top missing Dep on both M1s
	218 to 220	A1	

12(a)	$8x - 4 + 3x + 18$	M1	Allow one error
	$11x + 14$	A1	Ignore further working if they go on to solve $11x + 14 = 0$
(b)	$4x^2 - 2x^3$	B2	B1 each term
(c)	$x^2 - 3x + x - 3$	M1	Allow one error May appear in a grid
	$x^2 - 2x - 3$	A1	

13(a)	$19^2 - 9^2$ (= 280)	M1	or $a^2 + 9^2 = 19^2$
	√ (their 280)	M1 dep	
	16.7(33...)	A1	or 17 with working (1st M1)
(b)	Sight of tangent	M1	M2 for any complete method
	Angle = $\tan^{-1}(11 \div 24)$ or tan R = $\frac{11}{24}$	M1 dep	$\tan^{-1}$ 0.458(33...)
	24.6(2...)	A1	or 25 dep - on both M1s

14(a)	$4x + 3y = 33$	B1	Ignore £ signs
(b)	$6x + 6y = 57$	B1	Note: $4x + 3y$ and $6x + 6y$ without right hand side... SC1
(c)	Equalised coefficients	M1	Lhs correct + attempt to multiply either rhs
	$x = 4.5$	A1	
	$y = 5$	A1 ft	$x = 4.5$ and $y = 5$ with no working... SC1 or by trial and improvement SC1

15	$y = x + 3$	B1	
	$y = 3 - x^2$	B1	
	$y = 3x^2$	B1	

16(a)	Q and S	B2	1 right + 1 wrong... B1 2 right + 1 wrong... B1 1 right + 2 wrong... B0
(b)	$\frac{56}{42}$ or $\frac{42}{56}$ oe	M1	or $\frac{27}{42}$ or $\frac{42}{27}$
	their $(\frac{56}{42}) \times 27$ or $27 \div$ their $(\frac{42}{56})$	M1	or their $(\frac{27}{42}) \times 56$ or $56 \div$ their $(\frac{42}{27})$
	36	A1	Use of 1.3 → 35.1 A0 Use of 1.33 → 35.9 A1 Use of 1.333 → 35.991 A1