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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Mathematics 3302
Specification B

Module 5 Paper 1 Tier I 33005I1

Mark Scheme

2005 examination - November 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.

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1(a)	125	B1	
1(b)	64 or $(2^3 =)$ 8	M1	
	8	A1	

2(a)	131 + 72 + 97 or 300	M1	
	360 – their 300 or 60	M1 dep	
	120	A1	
2(b)	i) (180 – 30) ÷ 2	M1	Condone invisible brackets
	75	A1	
2(b)	ii) 105	B1 ft	

3(a)	(+) 1	B1	
3(b)	i) Correct solution	B1	eg × 3 and –10 × 2 and –3 × 1 and – – 4
3(b)	ii) 2nd different correct solution	B1	

4	2 × 1000 or 2000 seen or 1000 ÷ 10	M1	1000 in 5 cups
	2000 ÷ 10 or 200 (per cup) or 1000 ÷ 10 × 2 or 3000 or $2000 \div \frac{2}{3}$	M1	oe $100 \times \frac{3}{2}$
	their 200 × 1.5 or 3000 ÷ 10	M1	oe $100 \times \frac{3}{2} \times 2$ $200 \div \frac{2}{3}$
	300	A1	

5(a)	$\frac{1}{2} \times 20 \times 4$	M1	oe
	40	A1	
	cm^2	B1	Units mark
5(b)	i) 	B1	Accept any orientation
5(b)	ii) 9.1×5	M1	
	45.5	A1	

6(a)	21	B1	
	28	B1	
6(b)	Valid explanation	B1	Accept: Add 1, then add 2. ...etc Differences increasing by 1 Triangle numbers Adding on one more Do not accept: Adding on one Adding on an extra number +6 +7
6(c)	i) 30	B1	
6(c)	ii) $x(x + 1)$	B1	
6(c)	(iii) Valid explanation	B2	Odd × even = even scores B1 Even × odd = even scores B1 If x is odd, x^2 is odd, odd + odd = even **and** if x is even, x^2 is even, even + even = even scores B2 or B1 for each part One numerical eg $2^2 + 2 = 6$ B1 Two numerical B1 One odd and one even with eg both even B2

7(a)	$7a + 4b$	B2	B1 for each term Do not accept fw eg $7a + 4b = 11ab$ scores B1
7(b)	$8pq$	B1	
7(c)	$6x + 2 – 5x + 10$	M1	Allow one error
	$(1)x + 12$	A1	$(1)x – 8$ scores SC1
7(d)	$6x^3y^6$	B2	–1 eeoo

8(a)	Correct answer drawn	B2	B1 for a reflection in $x = c$ or $y = 3$
8(b)	Fully correct translation	B1	Vertices at (4, 3), (4, 7), (5, 4)
8(c)	Rotation	B1	
	90° anticlockwise	B1	270° clockwise or $\frac{1}{4}$ turn anticlockwise
	(3, 6)	B1	

9(a)	Moving at constant speed	B1	Same time **and** same speed B0
9(b)	Slowing down	B1	eg Variable speed B1 Down then up B0 Slows down, stops, speeds up B1
	(then) speeding up	B1	

10	Arc from 1 town radius 5 cm	M1	Tolerance ± 0.2 cm
	Arc from A, B and C radius 5 cm	A1	Tolerance ± 0.2 cm
	Region indicated	A1 ft	SC1 - Three equal arcs from A, B and C and region indicated

11(a)	–33 0 3	B2	–1 eeoo
11(b)	Seven points plotted correctly	B2 ft	–1 eeoo Tolerance < 1 mm
	Smooth curve	B1 ft	Must be through seven points Tolerance < 1 mm
11(c)	[–6.2, –6.5]	B1 ft	Follow through from their graph [Integer below, Integer above]
11(d)	[2.4, 2.5]	B1 ft	Follow through from their graph Tolerance ± 0.1

12(a)	Expression	B1	
12(b)	Equation	B1	
12(c)	Formula	B1	

13(a)	Yes	B1	
13(b)	No	B1	
13(c)	No	B1	

14(a)	1 2 3	B2	–1 eeoo
14(b)	eg (3, 1), (3, 0), (3, –1) ... (2, 1), (2, 0), (2, –1) ... (1, 0), (1, –1), ...	B2 ft	B1 for each point ft must satisfy 2nd and 3rd inequalities

15(a)	$\frac{3}{4}$ or $\frac{4}{3}$ or 3 : 4 or 4 : 3 seen	M1	$\frac{x}{7.5} = \frac{6}{10}$ oe eg $\frac{10}{7.5}$
	$\frac{3}{4} \times 6$	M1 dep	$\frac{6}{10} \times 7.5$ oe
	4.5	A1	oe
15(b)	$30 \times \frac{4}{3}$	M1	oe $30 \div 7.5 \times 10$
	40	A1	