

General Certificate of Secondary Education

Mathematics 3302 Specification B

Module 5 Intermediate Paper 1

Mark Scheme

2006 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:

Μ	Method marks awarded for a correct method.
Α	Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.
В	Marks awarded independent of method.
M dep awarded.	A method mark which is dependent on a previous method mark being
ft an	Follow through marks. Marks awarded for correct working following a mistake in 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 Paper 1

Q	Answers	Mark	Comments
		1	
1(a)	75	B1	
1(b)	180 - 84 - 75	M1	oe
	or 180 – 84 – their 75		
	21	Alft	ft provided answer positive
2(a)	70×500	M1	Digits 35 seen eg, 35, 3500, 35000
	or 70 ÷ 100		
	$70 \times 500 \div 100$	M1dep	35000 cm
	350	A1	
2(b)	10×100 or 1000	M1	Digit 2 seen
	or 10 ÷ 500		eg, 20, 200, 2000
	or 100 ÷ 500		
	$10 \times 100 \div 500$	M1dep	0.02 m
	2	A1	
2(c)	Pentagon	B1	
3(a)	$6x \text{ or } 6 \times x \text{ or } x \times 6$	B1	oe Do not allow <i>x</i> 6
3(b)	6x + 20	B1ft	oe ft their $(a) + 20$
3(c)(i)	Always even	B1	
3(c)(ii)	Valid explanation	B1	eg, 10 is even and 12 is even
			It is a multiple of 2
			2(5y+6)
			y = 3 gives 42 and $y = 4$ gives 52
			(one odd and one even example with correct answer)
3(d)	10y = 30	M1	$y = 3 \times 10 + 12$ or embedded
	3	A1	

Q	Answers	Mark	Comments
4(a)	$6 \times 4 \times 2$	M1	
	48	A1	
	cm ³	B1	Units mark
4(b)	2, 3 or 6 seen or 2×3 or 2×6 or 3×6 or 6×2 or 4×3 or $12 \times 12 \times 12$	M1	Any pair multiplied
	$2 \times 3 \times 6$ or $\frac{12 \times 12 \times 12}{6 \times 4 \times 2}$	M1dep	
	36	A1	
	•	-	•

5(a)	Correct reflection	B2	B1 for any reflection in $y = c$ or reflection in $x = 5$
5(b)	Rotation	B1	
	90° clockwise or 270° anticlockwise	B1	
	(About) (2, 3)	B1	

6(a)(i)	3x + 1 = 22	B1	oe eg, $x \times 3 + 1 = 22$
			Accept any letter
6(a)(ii)	7	B1	
6(b)	12x + 4 = 88	M1	3x + 1 = 22
	12x = 84	M1dep	3x = 21
	(x =) 7	A1	SC1 if no working shown and answer same as (a)(ii)

Q	Answers	Mark	Comments
7(a)	$13^2 + 13 = 13 \times 14$	B1	
7(b)	90	B1	
7(c)	2, 6, 12	B2	B1 for two terms correct
			B1 for 1×2 , 2×3 , 3×4
7(d)	$n^2 + n = 56$ or $n^2 + n - 56 = 0$	M1	or $7 \times 8 = 56$
	(n+8)(n-7) = 0	M1dep	n = -8 and $n = 7$
	7	A1	

8	360 ÷ 6 or 360 ÷ 8	M1	720 \div 6 or 4 × 180 \div 6 1080 \div 8 or 6 × 180 \div 8
	60	A1	120
	45	A1	135
	60 + 45 or 360 - 120 - 135	M1	their 60 + their 45 or 360 – their 120 – their 135
	105	A1	

9(a)	Sight of 64 or 100	M1	
	6400	A1	
9(b)(i)	a^7	B1	
9(b)(ii)	a^8	B1	
9(b)(iii)	a^{10}	B1	
9(c)(i)	$(a^5)^2$	B1	
9(c)(ii)	$a^3 \times a^4$	B1	

Q	Answers	Mark	Comments
		•	
10(a)	1.5 + y = 5	M1	Graph of $x + y = 5$ drawn
	<i>y</i> = 3.5	A1	x = 1.5 drawn or (3.5, 1.5)
	(1.5, 3.5)	A1	
10(b)	x + 2x + 8 = 5	M1	Attempt at graph of $y = 2x + 8$ (correct gradient or correct y intercept with positive gradient)
	3x = -3	A1	Graph of $x + y = 5$ drawn
	(-1, 6)	A1	

11(a)	x > -2	B1	oe Accept any letter used throughout
11(b)	$-4 \le x \le 1$	B2	oe B1 for each part or B1 for $-4 < x < 1$
11(c)	-1, 0, 1	B1	

12(a)	105	B1	
	Angles add up to 180°	B1	oe eg, allied angles (or interior)
12(b)	75 or $180 - \text{their } x$	B1ft	
	Opposite angles of cyclic quadrilateral add up to 180°	B1	oe
12(c)	105	B1ft	360 - 75 – their x – their y
			their x
			180 – their <i>y</i>

13	$\begin{aligned} x - y &= 5\\ (3x + y = 29) \end{aligned}$	M1	oe
	4x = 34 or $4y = 14$	A1	oe
	x = 8.5 or $y = 3.5$	A1	
	13.5	B1ft	$2 \times \text{their } 8.5 - \text{their } 3.5$