



General Certificate of Secondary Education

Mathematics 4302

Specification B

Module 5 Paper 2 Tier H 43005/2H

Mark Scheme

2008 examination - June series

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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

43005/2H

1	$\frac{1}{2} \times 10.4 \times 5.5$	M1	M1 for any complete method
	28.6	A1	If angle C (= 42.(12)°) used then answer 28.5(...)

2(a)	$5x - 3x$ or $7 + 4$	M1	or $3x - 5x$ or $-4 - 7$
	$2x = 11$	A1	oe
	$5\frac{1}{2}$ or 5.5 or $\frac{11}{2}$	A1	
2(b)	$13 - 5y = 4 \times 3$	M1	$\frac{13}{3} - \frac{5y}{3} = 4$
	$-5y = -1$	A1	or $5y = 1$ or $\frac{-5y}{3} = \frac{-1}{3}$ oe
	$\frac{1}{5}$ or 0.2	A1	

3(a)	Correct reflection	B2	B1 for reflection in any horizontal line or in $x = 2$ B1
3(b)	Correct translation	B1	

4(a)	127	B1	
4(b)	$n + 8, n + 9, n + 10$ oe	B2	oe B1 for any one correct
4(c)	$n + n + 8 + n + 9 + n + 10$	M1 ft	oe
	$4n + 27$	A1	SC1 for $3n + 27$
4(d)	$4n$ is always even	M1	Either 3 odds + 1 even, or 1 odd + 3 evens
	(27 is odd,) even + odd = odd	A1	3 odds = odd, odd + even = odd 3 evens = even, odd + even = odd SC1 either of these complete arguments but not both

5	$360 \div 8 (= 45)$	M1	Complete method for interior angle of octagon (= 135)
	$360 \div 5 (= 72)$	M1	Complete method for interior angle of pentagon (= 108)
	their 45 + their 72	M1 dep	Dep on both M1s $360 - (\text{their } 135 + \text{their } 108)$
	117	A1	117

6	$c - 2$ or $\frac{c}{5} = d + \frac{2}{5}$ oe	M1	
	$\frac{c-2}{5}$	A1	oe eg $\frac{c}{5} - 0.4$

7(a)	1 correct plot	M1	From $(-1, -7)$ $(0, -5)$ $(1, -3)$ $(2, -1)$ $(3, 1)$ $(4, 3)$ $(5, 5)$
	2nd correct plot	M1	
	Correct line from -1 to $+5$	A1	Fully correct line scores all 3 marks Line must be ruled
	Alternate method		
	Line with gradient 2	M1	
	Line through $(0, -5)$	M1	
	Correct line from -1 to $+5$	A1	
7(b)	$x = 3.3$	B1	± 0.1 ft their line to both marks for non-integer values but max B1 for integer values
	$y = 1.7$	B1	

8	9×2 or 2×3 or 9×4 or 3×4	M1	
	A correct combination to find area of cross-section	M1	
	their 24×65	M1 dep	
	1560	A1	
	cm^3	B1	
	Alternate method 1		
	$9 \times 2 \times 65 (= 1170)$	M1	
	$3 \times 2 \times 65 (= 390)$	M1	
	their 1170 + their 390	M1 dep	or another valid summation
	1560	A1	
	cm^3	B1	
	Alternate method 2		
	$3 \times 2 \times 65 (= 390)$	M1	
	their 390×4	M2 dep	
	1560	A1	
	cm^3	B1	
	Alternate method 3		
	$9 \times 4 \times 65 (= 2340)$	M1	
	$3 \times 2 \times 65 (= 390)$	M1	
	their 2340 – their (2×390)	M1 dep	
1560	A1		
cm^3	B1		

9(a)	Equal arcs above & below PQ	M1	
	Correct line drawn	A1	At least 1 cm long, crossing PQ
9(b)	Equidistant from P and Q	B1	oe

10(a)	x^4	B1	
10(b)	$6y^7z^5$	B2	B1 for either y^7 or z^5
10(c)	$8p^9r^6$	B2	B1 for either p^9 or r^6

11(a)	Tangent	M1	Scale drawing	M0
	$\frac{11}{16}$ (= 0.6875)	M1 dep		
	34.5(...)	A1	55 or 55.5 or 55.49	SC1
11(b)	$\frac{DF}{24} = \cos 64$	M1		
	$24 \times \cos 64$	M1 dep		
	10.5(209...)	A1		
	10.5 (or 11 with working)	B1 ft	Accuracy mark	

12	1.20×30 (= 36) oe	M1	or 1.10×15 (= 16.5) oe
	their $36 \times$ their 16.5	M1	
	594	A1	
	Alternative method		
	1.2×1.1	M1	or 1.32 seen
	their $1.32 \times 30 \times 15$	M1	
	594	A1	

13(a)	$(5x + 1)(x + 7)$	B2	Ignore putting = 0 B1 for $(5x + 7)(x + 1)$
13(b)	$3(y^2 - 4z^2)$	M1	
	$3(y - 2z)(y + 2z)$	A2	A1 for wrong signs
	$(3y - 6z)(y + 2z)$ or $(y - 2z)(3y + 6z)$ earns M1A1A0		

14	$\frac{YZ}{\sin 35} = \frac{25}{\sin 102}$	M1	oe
	$25 \times \frac{\sin 35}{\sin 102}$	M1	
	[14.65, 14.7]	A1	Allow 15 with working

15	$\vec{MC} = \mathbf{a}$	M1	Could be done without vectors: MC = OA and MC parallel to OA Do not accept OA parallel or BC
	Opposite sides equal and parallel	A1	

16	$\frac{1}{3} \pi r^2 28 = 2400$	M1	
	$r = \sqrt{(2400 \times 3) \div (\pi \times 28)} (= \sqrt{81.85})$	M1	
	[9.04, 9.05]	A1	Accept 9 or 9.1 with working

17	$4(x - 2) + 3x$	M1	
	$4(x - 2) + 3x = x(x - 2)$	M1 dep	Dep on 1st M1
	$x^2 - 9x + 8 = 0$	A1	
	$(x - 1)(x - 8)$	M1 dep	Dep on 1st M1 ft 3-term quadratic
	1 and 8	A1	