GCSE 2004
June Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark Scheme

Mathematics B (3302)
Module 5 Paper 2 Tier I

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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

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1	$28.8 \div 2$	M1	or $28.8 - 2 \times 10.8$ or 7.2
	(their 14.4) – 10.8	M1 dep	(their 7.2) ÷ 2
	3.6	A1	3.6

2(a)	Any k which is a multiple of 4	B1	eg $\frac{1}{2}4 + 1$ (= 3) or eg $k = 4$
(b)	Even	B1	

3(a)	i) Line must go at least from P to the opposite vertex	B1	Ignore additional **correct** lines of symmetry
	ii) 6	B1	
(b)	Any correct diagram	B2	B1 for any shape with correct symmetry but not three extra squares

4	100° at A	M1	± 2°
	C correct and triangle drawn	A1	$AC = 4$ cm ± 2 mm
			SC1 for 100° at B not A

5(a)	Any correct plot from this list: (–2, –7)(–1, –5)(0, –3)(1, –1) (2, 1)(3, 3)	M1	
	Second correct plot	M1	
	Correct line	A1	From –2 to +3
			$y = 2x$ $y = 2x - 3$ both drawn but $2x - 3$ not indicated SC1
(b)	(2.5, 2)	B1 ft	ft from their line

6(a)	$6x + 10y$	B2	oe B1 for $6x$ or $10y$ oe seen No penalty for eg $x6$
(b)	2×20 or 6×5	M1	or 2×25 or 4×5 or 6×25 or 4×20
	70	A1	

7	10.8×9.5 (= 102.6)	M1	or 17.5×9.5 M1
	$\frac{1}{2}(17.5 - 10.8) \times 9.5$ (= 31.825)	M1	or $\frac{1}{2}(6.7) \times 9.5$ M1 $\frac{1}{2}(10.8 + 17.5)\ 9.5$ gets M2
	134(.425)	A1	

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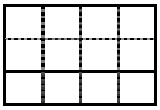
8(a)	$3(x - 2)$	B1	
(b)	$x(x - 2)$	B2	B1 for $x(x\ldots)$ or $x(\ldots -2)$

9		B2	B1 for a 4 by 1 rectangle or a 4 by 2 rectangle or a 4 by 3 rectangle Must be correct orientation

10	$650 \times \frac{15}{100}$	M1	oe Accept a complete build up method
	97.50	A1	Ignore subsequent working NB 97.5 scores A0

11(a)	$7p + q$	Penalise notation ($p7$) once only	B2	B1 for $7p$ or $(+)q$
(b)	$4r - 12$		B1	
(c)	$s^3 + 6s$		B2	B1 for s^3 or $(+)6s$
(d)	$6t^4u^3$		B2	–1 each error or omission $\times$ sign(s) count as one error

12(a)	$360 \div 8$	M1	or 45 seen or 6×180 or 1080 or $(2 \times 8 - 4)$ right angles
	180 – (their 45)	M1 dep	(their 1080) ÷ 8
	135	A1	135
(b)	360 – (their 135 + 135) or 2×45	M1	
	90° in X	A1	
	Sides of X are equal	B1	or (regular) octagons so sides are equal
			4 lines of symmetry or rotational symmetry of order 4 scores 3 marks Other symmetry scores B1

13	Trial for $x > 4$	B1	All trials correctly evaluated to at least 1 dp, rounded or truncated 5 → 5.2 4.5 → 4.72 4.6 → 4.81 4.7 → 4.91 4.75 → 4.96 4.76 → 4.97 4.77 → 4.979… 4.78 → 4.989… 4.79 → 4.998… 4.8 → 5.008… or 5 4.85 → 5.056…
	Trial for $4 < x \leq 5$	B1	
	Trials for $4.7 \leq x \leq 4.85$ that bracket the answer	B1	
	Trial for $4.75 \leq x < 4.8$ **and** answer 4.8	B1	

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14(a)	$2x \geq -2$	M1	Allow > but not = unless recovered in answer
	$x \geq -1$	A1	
(b)	$x < 2$	B1	oe condone change of letter
(c)	–1, 0, 1	B1 ft	ft their (a) and/or (b)

15(a)	$\pi(\frac{1}{2}\ 7.5)^2\ 11.6$	M2	M1 for $\pi(\frac{1}{2}\ 7.5)^2$ or 44.1(…) seen or 44.1786(π) or 44.1562(3.14)
	512.2 to 512.5…	A1	or 512
			$\pi \times (3. \ldots)^2 \times 11.6$ scores M1 $\pi(7.5)^2\ 11.6 \rightarrow$ 2048 to 2051… SC1
(b)	(circumference =) π7.5	M1	23.56… or 23.55 if used 3.14
	(their 23.56) + 1	M1 dep	or (their 23.56) × 11.6 M1 dep add 11.6 M1 dep 284.78 to 285 A1
	(their 24.56) × 11.6	M1 dep	
	284.78 to 285	A1	

16	$\sin(x) = \frac{20}{230}$	M1	
	0.0869(56…)	A1	or 0.0870
	4.99 or 5 or 4.9885…	A1	NB watch out for tangent
			Ans 5 from scale drawing scores 3 0.08706… or 5.542 as final answer scores M1A1A0

17	$y(y + 5)$	M1	
	0	A1	Trial & improvement giving 0 or –5 only: SC1
	–5	A1	

18	$\frac{60}{15} = \frac{h}{2.7}$	M2	oe M1 for $\frac{60}{15}$ or $\frac{15}{60}$ or $\frac{2.7}{15}$ or $\frac{15}{2.7}$
	10.8	A1	
			Trig method: Tan $G = \frac{2.7}{15}$ M1 (10.2º)
			(*h* =) 60 × tan (their 10.2) M1 dep
			10.79 or 10.8 A1

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19(a)	$V = x^2h$	M1	oe
	$x^2 = \frac{V}{h}$	M1 dep	
	$x = \sqrt{\frac{V}{h}}$	A1	Allow $\frac{V}{h}\sqrt{}$
(b)	2.5	B1 ft	ft their (a) if it includes both V and h