

GCE Examinations
Advanced / Advanced Subsidiary

Core Mathematics C2

Paper A

MARKING GUIDE

This guide is intended to be as helpful as possible to teachers by providing concise solutions and indicating how marks could be awarded. There are obviously alternative methods that would also gain full marks.

Method marks (M) are awarded for using a valid method.

Accuracy marks (A) can only be awarded when a correct method has been used.

(B) marks are independent of method marks.



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C2 Paper A – Marking Guide

1.	<p>(i) $\frac{1}{2} \times 9.2^2 \times \angle AOB = 37.4$ $\angle AOB = 0.884$ radians (3sf)</p> <p>(ii) $= (2 \times 9.2) + (9.2 \times 0.8837)$ $= 26.5$ cm (3sf)</p>	M1 A1 M1 A1	(4)
2.	<p>(i) $f(-1) = 0 \therefore -1 - k - 20 = 0$ $k = -21$</p> <p>(ii)</p> $ \begin{array}{r} x^2 - x - 20 \\ x + 1 \overline{) x^3 + 0x^2 - 21x - 20} \\ \underline{x^3 + x^2} \\ -x^2 - 21x \\ \underline{-x^2 - x} \\ -20x - 20 \\ \underline{-20x - 20} \\ 0 \end{array} $ <p>$(x + 1)(x^2 - x - 20) = 0$ $(x + 1)(x + 4)(x - 5) = 0$ $x = -4, -1, 5$</p>	M1 A1 M1 A1 M1 A1	(6)
3.	<p>$y = \int (3\sqrt{x} - x^2) dx$</p> <p>$y = 2x^{\frac{3}{2}} - \frac{1}{3}x^3 + c$</p> <p>$x = 1, y = \frac{2}{3} \therefore \frac{2}{3} = 2 - \frac{1}{3} + c$ $c = -1$</p> <p>$y = 2x^{\frac{3}{2}} - \frac{1}{3}x^3 - 1$</p> <p>when $x = 4, y = 2(\sqrt{4})^3 - \frac{1}{3}(4^3) - 1$ $y = 16 - 21\frac{1}{3} - 1 = -6\frac{1}{3}$</p>	M1 A2 M1 A1 M1 A1	(7)
4.	<p>(i) $r = \frac{27}{36} = \frac{3}{4}$</p> <p>(ii) $= 27 \times \frac{3}{4} = 20\frac{1}{4}$</p> <p>(iii) $a \times (\frac{3}{4})^2 = 36$ $a = 36 \times \frac{16}{9} = 64$ $S_{\infty} = \frac{64}{1 - \frac{3}{4}} = 256$</p>	M1 A1 M1 A1 M1 A1 M1 A1	(8)
5.	<p>(i) $\log_2(6 - x) + \log_2 x = 3$ $\log_2 [x(6 - x)] = 3$ $x(6 - x) = 2^3 = 8$ $x^2 - 6x + 8 = 0$ $(x - 2)(x - 4) = 0$ $x = 2, 4$</p> <p>(ii) $(n - 2) \lg 3 > 250 \lg 8$ $n > \frac{250 \lg 8}{\lg 3} + 2$ $n > 475.2$ smallest $n = 476$</p>	M1 M1 M1 A1 M1 A1 M1 A1	(8)

6.	(i)		B2
	(ii)	$(0, 1), (\frac{\pi}{4}, 0), (\frac{3\pi}{4}, 0)$	B3
	(iii)	$\cos 2x = 0.5$ $2x = \frac{\pi}{3}, 2\pi - \frac{\pi}{3}$ $2x = \frac{\pi}{3}, \frac{5\pi}{3}$ $x = \frac{\pi}{6}, \frac{5\pi}{6}$	B1 M1 A1 (8)
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7.	(i)	$= \frac{1}{2}x^2 + 5x + 6x^{\frac{1}{2}} + c$	M1 A3
	(ii)	$= \int_{-2}^0 (9x^2 - 6x + 1) dx$ $= [3x^3 - 3x^2 + x]_{-2}^0$ $= (0) - (-24 - 12 - 2) = 38$	M1 M1 A1 M1 A1 (9)
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8.	(a)	(i) $\frac{20}{2} [2a + (19 \times 7)] = 530$ $2a + 133 = 53, a = -40$	M1 M1 A1
	(ii)	$= -40 + 7k = -40 + 42 = 2$	M1 A1
	(b)	(i) $u_1 = (1 + k)^2, u_2 = (2 + k)^2$ $(2 + k)^2 = 2(1 + k)^2$ $4 + 4k + k^2 = 2 + 4k + 2k^2$ $k^2 = 2$ $k > 0 \therefore k = \sqrt{2}$	B1 M1 M1 A1
	(ii)	$u_3 = (3 + \sqrt{2})^2 = 9 + 6\sqrt{2} + 2 = 11 + 6\sqrt{2}$	M1 A1 (11)
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9.	(i)	$2x^2 + 6x + 7 = 2x + 13$ $x^2 + 2x - 3 = 0$ $(x + 3)(x - 1) = 0$ $x = -3, 1$ $\therefore (-3, 7), (1, 15)$	M1 M1 A1 A1
	(ii)	$\text{area} = \int_{-3}^1 [(2x + 13) - (2x^2 + 6x + 7)] dx$ $= \int_{-3}^1 (6 - 4x - 2x^2) dx$	M1 A1
	(iii)	$= [6x - 2x^2 - \frac{2}{3}x^3]_{-3}^1$ $= (6 - 2 - \frac{2}{3}) - (-18 - 18 + 18) = 21\frac{1}{3}$	M1 A2 M1 A1 (11)
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Total			(72)

Performance Record – C2 Paper A

Question no.	1	2	3	4	5	6	7	8	9	Total
Topic(s)	sector of a circle	factor theorem, alg. div.	integr.	GP	logs	trig. graph, trig. eqn	integr.	AP, sequence	area by integr.	
Marks	4	6	7	8	8	8	9	11	11	72
Student										