

GCE Examinations
Advanced Subsidiary

Core Mathematics C1

Sample Paper from Solomon Press

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 knowing and using a method.

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

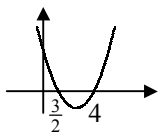
(B) marks are independent of method marks.

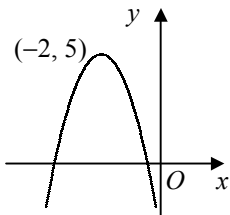
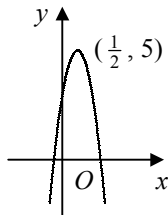
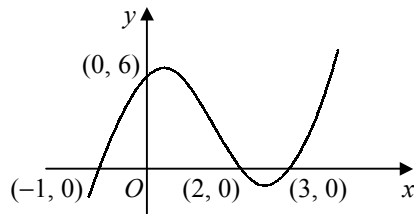


Written by Shaun Armstrong

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C1 Sample Paper – Marking Guide

1.	$(2x - 3)(x - 4) < 0$ $\frac{3}{2} < x < 4$		M1 A1 M1 A1	(4)
2.	<p>(a) $= \left(\frac{25}{4}\right)^{-\frac{1}{2}} = \sqrt{\frac{4}{25}} = \frac{2}{5}$</p> <p>(b) $2^{x+1} = 2^2 \times 2^{\frac{1}{2}} = 2^{\frac{5}{2}}$ $x + 1 = \frac{5}{2}$ $x = \frac{3}{2}$</p>		M1 A1 B1 M1 A1	(5)
3.	<p>(a) $u_2 = 8 + 3k, u_3 = 8 + k(8 + 3k) = 3k^2 + 8k + 8$ $\therefore 3k^2 + 8k + 8 = 11$ $3k^2 + 8k - 3 = 0$ $(3k - 1)(k + 3) = 0$ $k = -3, \frac{1}{3}$</p> <p>(b) $k = -3$ $\therefore u_4 = 8 - 3(11) = -25$</p>		B1 M1 A1 M1 A1 B1	(6)
4.	<p>(a) $= 4x^{\frac{3}{2}} - \frac{1}{2}x^2 + c$</p> <p>(b) $y = 4x^{\frac{3}{2}} - \frac{1}{2}x^2 + c$ $(1, 6\frac{1}{2}) \Rightarrow 6\frac{1}{2} = 4 - \frac{1}{2} + c$ $c = 3$ $y = 4x^{\frac{3}{2}} - \frac{1}{2}x^2 + 3$ when $x = 4, y = 4(8) - \frac{1}{2}(16) + 3 = 32 - 8 + 3 = 27$ $\therefore (4, 27)$ lies on $y = f(x)$</p>		M1 A1 M1 A1 M1 A1	(6)
5.	$2x - y + 9 = 0 \Rightarrow y = 2x + 9$ sub. into $x^2 + 2xy + y^2 = 9$ $x^2 + 2x(2x + 9) + (2x + 9)^2 = 9$ $x^2 + 6x + 8 = 0$ $(x + 2)(x + 4) = 0$ $x = -2, -4$ $\therefore x = -2, y = 5$ or $x = -4, y = 1$		M1 M1 A1 M1 A1 M1 A1	(7)
6.	<p>(a) $\frac{dy}{dx} = 1 - 8x^{-2}$ grad at $(2, 9) = 1 - (8 \times \frac{1}{4}) = -1$</p> <p>(b) at Q, grad = -1 $\therefore 1 - 8x^{-2} = -1$ $x^2 = 4$ $x = 2$ (at P) or -2 $\therefore Q(-2, -3)$</p>		M1 A1 M1 A1 M1 A1 A1	(7)

7.	(a)	(i)		(ii)		B2 B2
	(b)	quadratic, turning point (1, 5) $\therefore f(x) = k(x-1)^2 + 5 = kx^2 - 2kx + k + 5$ $\therefore k + 5 = 3, k = -2$ $\therefore a = -2, b = 4$				M1 A1 M1 A1 (8)
8.	(a)	$= 20 + (7 \times 4) = 48$				M1 A1
	(b)	AP, $a = 20, d = 4$ $S_{12} = \frac{12}{2} [40 + (11 \times 4)] = 504$				M1 A1
	(c)	after n months, membership $= 400 + S_n - 8n$ $\therefore 400 + \frac{n}{2} [40 + 4(n-1)] - 8n = 1000$ $n^2 + 5n - 300 = 0$ $(n+20)(n-15) = 0$ $n > 0 \therefore n = 15 \therefore 15 \text{ months}$				M1 M1 A1 A1 M1 A1 (10)
9.	(a)	$\text{grad} = \frac{3-2}{1-(-2)} = \frac{1}{3}$ $\therefore y - 2 = \frac{1}{3}(x + 2)$ $3y - 6 = x + 2$ $x - 3y + 8 = 0$				M1 A1 M1 A1
	(b)	$\text{grad } l_2 = \frac{-1}{\frac{1}{3}} = -3$ $\therefore y + 1 = -3(x - 9) \quad [y = 26 - 3x]$				M1 A1
	(c)	at D, $x - 3(26 - 3x) + 8 = 0$ $x = 7 \therefore D(7, 5)$ $AB = \sqrt{(1+2)^2 + (3-2)^2} = \sqrt{9+1} = \sqrt{10}$ $AD = \sqrt{(7+2)^2 + (5-2)^2} = \sqrt{81+9} = \sqrt{90} = 3\sqrt{10}$ $\therefore AB : AD = \sqrt{10} : 3\sqrt{10} = 1 : 3$				M1 A1 M1 A1 A1 (11)
10.	(a)	$\text{LHS} = (x+1)(x^2 - 5x + 6) = x(x^2 - 5x + 6) + (x^2 - 5x + 6)$ $= x^3 - 5x^2 + 6x + x^2 - 5x + 6 = x^3 - 4x^2 + x + 6 = \text{RHS}$				M1 A1
	(b)					B3
	(c)	when $x = 1, y = 1 - 4 + 1 + 6 = 4$ $\frac{dy}{dx} = 3x^2 - 8x + 1$ when $x = 1, \text{grad} = 3 - 8 + 1 = -4$ $\therefore y - 4 = -4(x - 1) \quad [y = 8 - 4x]$				B1 M1 A1 A1 M1 A1 (11)

Total (75)

Performance Record – C1 Sample Paper

[illegible]