FOR EDEXCEL

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.

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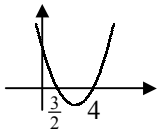
C1 Sample Paper – Marking Guide

1. $(2x-3)(x-4)<0$



M1 A1

M1

$\frac{3}{2} < x < 4$ A1 **(4)**

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2. *(a)* $= (\frac{25}{4})^{-\frac{1}{2}} = \sqrt{\frac{4}{25}} = \frac{2}{5}$ M1 A1

(b) $2^{x+1} = 2^2 \times 2^{\frac{1}{2}} = 2^{\frac{5}{2}}$ B1

$x + 1 = \frac{5}{2}$ M1

$x = \frac{3}{2}$ A1 **(5)**

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3. *(a)* $u_2 = 8 + 3k,\ u_3 = 8 + k(8 + 3k) = 3k^2 + 8k + 8$ B1 M1

$\therefore\ 3k^2 + 8k + 8 = 11$

$3k^2 + 8k - 3 = 0$ A1

$(3k - 1)(k + 3) = 0$ M1

$k = -3,\ \frac{1}{3}$ A1

(b) $k = -3$

$\therefore\ u_4 = 8 - 3(11) = -25$ B1 **(6)**

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4. *(a)* $= 4x^{\frac{3}{2}} - \frac{1}{2}x^2 + c$ M1 A1

(b) $y = 4x^{\frac{3}{2}} - \frac{1}{2}x^2 + c$

$(1,\ 6\frac{1}{2}) \Rightarrow \quad 6\frac{1}{2} = 4 - \frac{1}{2} + c$ M1

$c = 3$ A1

$y = 4x^{\frac{3}{2}} - \frac{1}{2}x^2 + 3$

when $x = 4,\ y = 4(8) - \frac{1}{2}(16) + 3 = 32 - 8 + 3 = 27$ M1

$\therefore\ (4, 27)$ lies on $y = f(x)$ A1 **(6)**

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5. $2x - y + 9 = 0 \Rightarrow \quad y = 2x + 9$ M1

sub. into $x^2 + 2xy + y^2 = 9$

$x^2 + 2x(2x + 9) + (2x + 9)^2 = 9$ M1

$x^2 + 6x + 8 = 0$ A1

$(x + 2)(x + 4) = 0$ M1

$x = -2, -4$ A1

$\therefore\ x = -2,\ y = 5$ or $x = -4,\ y = 1$ M1 A1 **(7)**

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6. *(a)* $\frac{dy}{dx} = 1 - 8x^{-2}$ M1 A1

grad at $(2, 9) = 1 - (8 \times \frac{1}{4}) = -1$ M1 A1

(b) at Q, grad $= -1$

$\therefore\ 1 - 8x^{-2} = -1$ M1

$x^2 = 4$ A1

$x = 2$ (at P) or -2

$\therefore\ Q\ (-2, -3)$ A1 **(7)**

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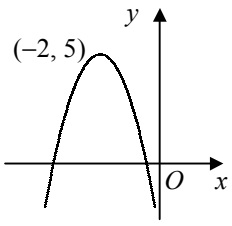
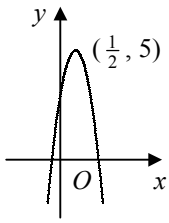
7. *(a)* *(i)*



(ii)



B2
B2

(b) quadratic, turning point (1, 5)

$\therefore$ $f(x) = k(x-1)^2 + 5 = kx^2 - 2kx + k + 5$ M1 A1

$\therefore$ $k + 5 = 3$, $k = -2$ M1

$\therefore$ $a = -2$, $b = 4$ A1 **(8)**

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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 $= 400 + S_n - 8n$ M1

$\therefore$ $400 + \frac{n}{2}[40 + 4(n-1)] - 8n = 1000$ M1 A1

$n^2 + 5n - 300 = 0$ A1

$(n + 20)(n - 15) = 0$ M1

$n > 0$ $\therefore$ $n = 15$ $\therefore$ 15 months A1 **(10)**

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9. *(a)* grad $= \frac{3-2}{1-(-2)} = \frac{1}{3}$ M1 A1

$\therefore$ $y - 2 = \frac{1}{3}(x + 2)$ M1

$3y - 6 = x + 2$

$x - 3y + 8 = 0$ A1

(b) grad $l_2 = \dfrac{-1}{\frac{1}{3}} = -3$ M1

$\therefore$ $y + 1 = -3(x - 9)$ $\quad [\, y = 26 - 3x \,]$ A1

(c) at D, $x - 3(26 - 3x) + 8 = 0$ M1

$x = 7$ $\therefore$ D (7, 5) A1

$AB = \sqrt{(1+2)^2 + (3-2)^2} = \sqrt{9+1} = \sqrt{10}$ M1

$AD = \sqrt{(7+2)^2 + (5-2)^2} = \sqrt{81+9} = \sqrt{90} = 3\sqrt{10}$ A1

$\therefore$ $AB : AD = \sqrt{10} : 3\sqrt{10} = 1 : 3$ A1 **(11)**

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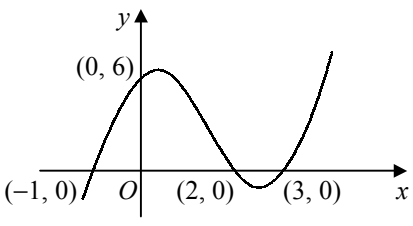
10. *(a)* LHS $= (x + 1)(x^2 - 5x + 6) = x(x^2 - 5x + 6) + (x^2 - 5x + 6)$ M1

$= x^3 - 5x^2 + 6x + x^2 - 5x + 6 = x^3 - 4x^2 + x + 6 =$ RHS A1

(b)



B3

(c) when $x = 1$, $y = 1 - 4 + 1 + 6 = 4$ B1

$\dfrac{dy}{dx} = 3x^2 - 8x + 1$ M1 A1

when $x = 1$, grad $= 3 - 8 + 1 = -4$ A1

$\therefore$ $y - 4 = -4(x - 1)$ $\quad [\, y = 8 - 4x \,]$ M1 A1 **(11)**

Total **(75)**

Performance Record – C1 Sample Paper

Question no.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	Total
Topic(s)	inequal.	indices	recur. relation	integr.	simul. eqn	diff.	transform., quad.	AP	straight lines	curve sketch, diff.	
Marks	4	5	6	6	7	7	8	10	11	11	75
Student											