FOR EDEXCEL

GCE Examinations
Advanced Subsidiary

Core Mathematics C1

Paper J

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.

Solomon Press

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C1 Paper J – Marking Guide

1. grad $AB = \frac{-2-0}{5-(-3)} = -\frac{1}{4}$ M1 A1

$\therefore\ y - 1 = -\frac{1}{4}(x - 4)$ M1

$4y - 4 = -x + 4$

$x + 4y = 8$ A1 **(4)**

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2. $= \sqrt{\frac{45}{2}} = \frac{3\sqrt{5}}{\sqrt{2}}$ M1 A1

$= \frac{3\sqrt{5}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{3}{2}\sqrt{10}$ M1 A1 **(4)**

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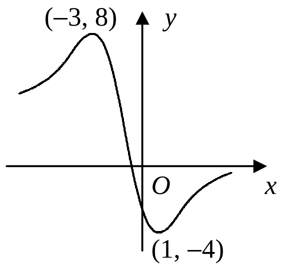
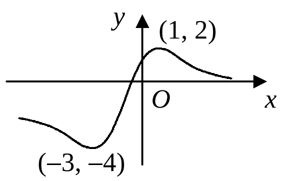
3. *(a)*



B3

(b)



B3

(6)

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4. *(a)* $4x - 8 < 2x + 5$

$2x < 13$ M1

$x < 6\frac{1}{2}$ A1

(b) $(2^2)^{y+1} = (2^3)^{2y-1}$ M1

$2^{2y+2} = 2^{6y-3}$ A1

$2y + 2 = 6y - 3$ M1

$y = \frac{5}{4}$ A1 **(6)**

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5. *(a)* $t_2 = 3k - 7$ B1

$t_3 = k(3k - 7) - 7 = 3k^2 - 7k - 7$ M1 A1

(b) $3k^2 - 7k - 7 = 13$

$3k^2 - 7k - 20 = 0$

$(3k + 5)(k - 4) = 0$ M1

$k = -\frac{5}{3}, 4$ A2 **(6)**

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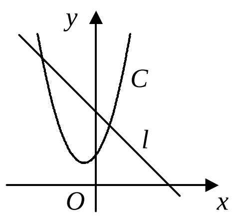
6. $x = 2\ \therefore\ y = \sqrt{16} = 4$ B1

$y = \sqrt{8}\sqrt{x} = 2\sqrt{2}\,x^{\frac{1}{2}}$ B1

$\frac{dy}{dx} = \sqrt{2}\,x^{-\frac{1}{2}}$ M1 A1

grad $= \frac{\sqrt{2}}{\sqrt{2}} = 1$ M1

$\therefore\ y - 4 = 1(x - 2)$ [$y = x + 2$] M1 A1 **(7)**

7.	*(a)*	$a = 20 \times 7 = 140,\ d = 2 \times 7 = 14$	B1	
		$u_5 = 140 + (4 \times 14) = 196$	M1 A1	
	(b)	$S_8 = \frac{8}{2}[280 + (7 \times 14)] = 4 \times 378 = 1512$	M1 A1	
	(c)	$140 + 14(n - 1) > 300$	M1	
		$n > \frac{160}{14} + 1$	M1	
		$n > 12\frac{3}{7} \quad \therefore n = 13$	A1	**(8)**
8.	*(a)*	$t = 0, A = 4 \quad \Rightarrow \quad 4 = p^2$	M1	
		$p > 0 \quad \therefore p = 2$	A1	
		$t = 5, A = 9 \quad \Rightarrow \quad 9 = (2 + 5q)^2$	M1	
		$2 + 5q = \pm 3$		
		$q = \frac{1}{5}(-2 \pm 3)$	M1	
		$q > 0 \quad \therefore q = \frac{1}{5}$	A1	
	(b)	$A = (2 + \frac{1}{5}t)^2 = 4 + \frac{4}{5}t + \frac{1}{25}t^2$	M1 A1	
		$\frac{dA}{dt} = \frac{4}{5} + \frac{2}{25}t$	M1 A1	
	(c)	$t = 15 \quad \therefore \frac{dA}{dt} = \frac{4}{5} + \frac{2}{25}(15) = 2 \text{ cm}^2 \text{ s}^{-1}$	M1 A1	**(11)**
9.	*(a)*	$x^2 + 2x + 4 = (x + 1)^2 - 1 + 4$	M1	
		$= (x + 1)^2 + 3$	A1	
		minimum: $(-1, 3)$	A2	
	(b)		B2 B1	
	(c)	$x^2 + 2x + 4 = 8 - x$		
		$x^2 + 3x - 4 = 0$		
		$(x + 4)(x - 1) = 0$	M1	
		$x = -4, 1$	A1	
		$\therefore (-4, 12)$ and $(1, 7)$	M1 A1	**(11)**
10.	*(a)*	$y = \int (3 - \frac{2}{x^2})\ dx$		
		$y = 3x + 2x^{-1} + c$	M1 A2	
		$(2, 6) \quad \therefore \quad 6 = 6 + 1 + c$		
		$c = -1$	M1	
		$y = 3x + 2x^{-1} - 1$	A1	
	(b)	grad $= 3 - \frac{1}{2} = \frac{5}{2}$	M1 A1	
		$y - 6 = \frac{5}{2}(x - 2)$	M1	
		$2y - 12 = 5x - 10$		
		$5x - 2y + 2 = 0$	A1	
	(c)	$3x + 2x^{-1} - 1 = x + 3$		
		$3x^2 + 2 - x = x^2 + 3x$	M1	
		$x^2 - 2x + 1 = 0$		
		$(x - 1)^2 = 0$, repeated root $\therefore$ tangent	M1 A1	**(12)**
			Total	**(75)**

Performance Record – C1 Paper J

Question no.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	Total
Topic(s)	straight line	surds	transform.	inequal., indices	recur. relation	diff., tangent	AP	diff., rate of change	compl. square, curve sketch	integr., tangents	
Marks	4	4	6	6	6	7	8	11	11	12	75
Student											