Edexcel GCE
Core Mathematics C2

Practice Paper A5

(Mark Scheme)

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Question number		Scheme	Marks
1.	(*a*)	Uses f(1) = 9, $\Rightarrow a + b = 2$ (o.e)	M1, A1 (2)
	(*b*)	Uses f(–2) = 0, $\Rightarrow -8a + 4b = -28$ (o.e)	
		$\therefore a = 3, b = -1$ (solves to find both values M1)	M1 A1 cao. (4)
			(6 marks)
2.	(i)	Divide: $1 + 2x^{-1}$	M1 A1
		Differentiate: $6x^2 + \frac{1}{2}x^{-\frac{1}{2}} - 2x^{-2}$	M1 A2 (1,0) (5)
	(ii)	$\frac{x^2}{4} + \frac{x^{-1}}{-1}$	M1 A1A1
		$[\ ]^4 - [\ ]_1 = \left(4 - \frac{1}{4}\right) - \left(\frac{1}{4} - 1\right) = 4\frac{1}{2}$	M1 A1 (5)
			(10 marks)
3.	(*a*)	$S = a + (a + d) + (a + 2d) + \ldots + [a + (n - 1)d]$	B1
		$S = [a + (n - 1)d] + [a + (n - 2)d] + \ldots + a$	M1
		Add: $2S = n[2a + (n - 1)d] \Rightarrow S = \frac{1}{2}n[2a + (n - 1)d]$	M1 A1 (4)
	(*b*)	$a = 54000$ and $n = 9$	B1
		$619200 = \frac{1}{2} \times 9 \times (2 \times 54000 + 8d)$	M1 A1ft
		$d = 3700$	A1 (4)
	(*c*)	$a + (n - 1)d = a + 10d = 54000 + 10d = £91000$	M1 A1 (2)
	(*d*)	$ar^{n-1} = 54000 \times 1.06^{10}$ (ft their *n*)	M1 A1ft
		$= £96700$ (or £97000)	A1 (3)
			(13 marks)

Question number		Scheme	Marks
4.	(a)	Adding: $\sin(A + B) + \sin(A - B) = 2 \sin A \cos B$	M1
		$A + B = X$ $A - B = Y$ $\qquad 2A = X + Y$	M1
		$A = \frac{1}{2}(X + Y), \qquad B = \frac{1}{2}(X - Y)$	A1
		$\text{Sin } X + \sin Y = 2 \sin\left(\frac{X+Y}{2}\right) \cos\left(\frac{X-Y}{2}\right)$ *	A1 (4)
	(b)	$\sin 4\theta + \sin 2\theta = 2 \sin 3\theta \cos \theta$	M1
		$\sin 3\theta = 0 \qquad (\text{or } \cos \theta = 0)$	M1
		$\theta = 0°, 60°, 120°, 240°, 300°$ 4 correct	A1
		$90°, 270°$ 6 correct	A1
		8 correct	A1 (5)
			(9 marks)
5.	(a)	$\frac{1}{2}R^2\theta = \frac{49}{2}\theta \qquad \text{or} \qquad \frac{1}{2}r^2\theta = \frac{25}{2}\theta$	B1
		$\frac{1}{2}R^2\theta - \frac{1}{2}r^2\theta = \frac{49}{2}\theta - \frac{25}{2}\theta = 12\theta$	M1A1 (3)
	(b)	$12\theta = 15 \qquad \theta = 1.25$ *	M1 A1 (2)
	(c)	$R\theta = 7 \times 1.25 \qquad (\text{or } r\theta = 5 \times 1.25$	B1
		$R\theta + r\theta + 4 = 8.75 + 6.25 + 4 = 19$ m	M1 A1 (3)
	(d)	$\sin 0.625 = \frac{x}{5} \qquad AD = 2x \qquad (= 5.851 \text{ m})$	M1
		$6.25 - 5.85 = 0.399 \qquad 40$ cm (M dep on previous M)	M1 A1 (3)
			(11 marks)

Question number	Scheme	Marks
6. (a)	EITHER expanding	
	Using coefficients 1, 5, 10, 10, 5, 1 as necessary	M1
	Using powers x^5 $2x^4$ 2^2x^3 etc as necessary	M1
	Completing the method	M1
	$A = 64$	B1
	$B = 160$, $C = 20$	A2, 1,0 (6)
	OR substituting values for x	
	$x =$ $\rightarrow$ $A = 64$	B1
	Forming a first equation in B and C	M1
	Forming a second equation in B and C	M1
	Solving to complete the method down to either $B =$ or $C =$	M1
	$B = 160$, $C = 20$	A2, 1, 0
(b)	Candidates values of A, B, C used to form	
	$20x^4 + 160x^2 + 64 = 349$	M1
	$4y^2 + 32y - 57 = 0$ (3 term quadratic needed)	A1 ft
	Solving for y	M1
	Replacing by x^2 and completing to obtain all relevant values of x	M1
	$\pm\sqrt{\frac{3}{2}}$ or AWRT $\pm$ 1.22	A1 cao (5)
		(11 marks)

Question number		Scheme	Marks
7.	(a)	$x(x^2 - 6x + 5)$	M1
		$x(x - 1)(x - 5)$	M1 A1 (3)
	(b)	1 and 5	B1 ft (1)
	(c)	$\frac{dy}{dx} = 3x^2 - 12x + 5$	M1 A1
		At $x = 1$. $\frac{dy}{dx} = 3 - 12 + 5 = -4$	A1 (3)
	(d)	$\int (x^3 - 6x^2 + 5x)dx = \frac{x^4}{4} - \frac{6x^3}{3} + \frac{5x^2}{2}$	M1 A1
		$[.....]_0^1 = \frac{1}{4} - 2 + \frac{5}{2}$ $(= \frac{3}{4})$ R	M1 A1ft
		Evaluating at 5: $\frac{625}{4} - 250 + \frac{125}{2}$ $(= -31\frac{1}{4})$	A1
		To find S: $-31\frac{1}{4} - \frac{3}{4} = -32$	M1
		Total Area = $32 + \frac{3}{4} = 32\frac{3}{4}$	A1 (7)
			(14 marks)