

Edexcel GCE
Core Mathematics C1
Practice Paper A5
(Mark scheme)

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Mr.S.V.Swarnaraja (Marking Examiner, Team Leader & Author)
www.swanash.com, Mobile: +94777304755 , email: swa@swanash.com**

Question number	Scheme		Marks
1.	(a)	$k = 3$	B1 (1)
	(b)	$(2^2)^x = (2^3)^{2-x}$ (A1 for $2x$ and $3(2-x)$) $2x = 3(2-x)$ $5x = 6$ $x = 1.2$	M1 A1 (4)
			(5 marks)
2.	(a)	$8 + 4\sqrt{7} - 2\sqrt{7} - 7 = 1 + 2\sqrt{7}$	M1 A1 (2)
	(b)	$\frac{2+\sqrt{7}}{4+\sqrt{7}} \times \frac{4-\sqrt{7}}{4-\sqrt{7}} = \frac{1+2\sqrt{7}}{16-7}$ $c = \frac{1}{9}$ $d = \frac{2}{9}$	M1 A1 ft (3)
			(5 marks)
3.	(a)	$\frac{dy}{dx} = 10 \times \frac{3}{2} x^{\frac{1}{2}} \left(= 15x^{\frac{1}{2}} \right)$	M1 A1 (2)
	(b)	$7x + 4x^{\frac{5}{2}} + C$	M1 A2(1,0) (3)
			(5 marks)
4.	(a)	$(x+k)^2 - 7 - k^2 = 0$ $(x+k)^2$ (LHS) $\Rightarrow (x+k)^2 = 7 + k^2 = 0 \quad \therefore x+k = (\pm) \sqrt{7+k^2}$ $\therefore x = -k \pm \sqrt{7+k^2}$	M1 A1 (4)
	(b)	$7 + k^2 > 0$ (or discriminant > 0) \therefore roots are real and distinct	M1 A1 (2)
	(c)	$k = \sqrt{2} \Rightarrow x = -\sqrt{2} \pm \sqrt{7+2}$ $x = -\sqrt{2} + 3$ or $-\sqrt{2} - 3$	M1 A1 (both) (2)
			(8 marks)

Question number	Scheme	Marks
<p>7. (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	$\frac{5 - (-3)}{8 - 2} = \frac{4}{3}$ $M: \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \quad (5, 1)$ <p>Gradient of CM is $-\frac{3}{4}$</p> <p>Equation of CM: $y - 1 = -\frac{3}{4}(x - 5)$ $(4y = -3x + 19)$</p> <p>When $x = 4$, $y = \frac{7}{4}$</p> $\text{Radius} = \sqrt{(4 - 2)^2 + \left(\frac{7}{4} + 3\right)^2}$ $= \sqrt{4 + \frac{361}{16}} = \sqrt{\frac{425}{16}} = \sqrt{\frac{25}{16}} \sqrt{17} = \frac{5\sqrt{17}}{4}$	<p>M1 A1 (2)</p> <p>M1 A1</p> <p>B1 ft</p> <p>M1 A1 (5)</p> <p>M1 A1 ft (2)</p> <p>M1 A1 ft</p> <p>* M1 A1 (4)</p> <p>(13 marks)</p>
<p>8. (a)</p> <p>(b)</p>	$2r^2h = 1030, \quad h = \frac{515}{x^2}$ $A = 4x^2 + 6xh$ $A = 4x^2 + \frac{3090}{x}$	<p>M1, A1 (2)</p> <p>B1</p> <p>* M1 A1 (3)</p> <p>(5 marks)</p>