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	Page 4	Mark Scheme	5yllabus 9709	23	r
<u> </u>			0100	20	
1	EITHER	State or imply non-modular inequality $(x-2)^2 \ge (x+5)^2$, or			
		corresponding equation or pair of linear equations		M1	
		Obtain critical value $-\frac{3}{2}$		A1	
		State correct answer $x \le -\frac{3}{2}$		A1	
	OR	State a correct linear equation for the critical value, e.g. $x - 2 = \frac{1}{2}$	= -x - 5,	M1	
		of corresponding correct linear inequality, e.g. $x - 2 \ge -x - 3$,	IVI I	
		Obtain critical value $-\frac{3}{2}$		Al	
		State correct answer $x \le -\frac{3}{2}$		A1	[3]
2	Use law for the logarithm of a product, a quotient or a power Obtain $x \log 5 = (2x - 1) \log 3$ or equivalent Solve for x Obtain answer $x = 1.87$			M1* A1 M1(dep*) A1	[4]
3	Make relevar	It use of the $\cos 2\theta$ formula		M1	
	Obtain a corr	ect quadratic in $\cos \theta$		A1	
	Solve a quad	ratic in $\cos \theta$		M1	E 43
	(Ignore answe	er $\theta = 60$ and no others in the range ers outside the given range)		Al	[4]
4	(i) State $\frac{dx}{dt}$	$\frac{dy}{dt} = \frac{-2}{1-2t}$ or $\frac{dy}{dt} = -2t^{-2}$		B1	
	Use $\frac{dy}{dx}$	$=\frac{dy}{dt} \div \frac{dx}{dt}$		M1	
	Obtain g	given answer correctly		A1	[3]
	(ii) Equate of	lerivative to 3 and solve for t		M1	
	State or Obtain c	coordinates $(\ln 3, -2)$		Al Al	[3]

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5	(i)	Attempt t Obtain 1–	o integrate and use limits θ and π		M1 A1	[2]
	(ii)	State that and rearra	area of rectangle = $\theta \cos \theta$, equate area of rectangle to area of ange to given equation	R	B1	[1]
	(iii)	Use the it Obtain fir Show suf	erative formula correctly at least once nal answer 0.56 ficient iterations to justify its accuracy to 2 d.p. or show there	is a	M1 A1	
		sign chan	ge in the interval (0.555, 0.565)		B1	[3]
6	(a)	State or in Use corre Obtain an	nply correct ordinates 0.125, 0.08743, 0.21511 ct formula, or equivalent, correctly with $h = 0.5$ and three ordi swer 0.11 with no errors seen	inates	B1 M1 A1	[3]
	(b)	Attempt t Integrate Obtain 2 o Fully corr	o expand brackets and divide by e^{2x} a term of form ke^{-x} or ke^{-2x} correctly correct terms rect integral $x + 4e^{-x} - 2e^{-2x} + c$		M1 A1√ [♣] A1 A1	[4]
7	(i)	Substitute Substitute Obtain a o Solve a re Obtain a	e x = -1, equate to zero and obtain a correct equation in any for e x = 3 and equate to 12 correct equation in any form elevant pair of equations for <i>a</i> or for <i>b</i> = -4 and $b = 6$	rm	B1 M1 A1 M1 A1	[5]
	(ii)	Attempt o Obtain qu Obtain re	livision by $x^2 - 2$ and reach a partial quotient of $2x - k$ notient $2x - 4$ mainder -2		M1 A1 A1	[3]
8	(i)	Differenti Obtain de Obtain gi	ate using chain or quotient rule rivative in any correct form ven answer correctly		M1 A1 A1	[3]
	(ii)	Differenti State deri Use trig i Obtain 2s	tate using product rule vative of $\tan \theta = \sec^2 \theta$ dentity $1 + \tan^2 \theta = \sec^2 \theta$ correctly $ec^3 \theta - \sec \theta$		M1 B1 M1 A1	[4]
	(iii)	Use tan ² Obtain 3s Obtain tan Attempt t	$x = \sec^{2} \theta - 1 \text{ to integrate } \tan^{2} x$ ec θ from integration of $3\sec \theta \tan \theta$ in $\theta - 3\sec \theta$ o substitute limits, using exact values		M1 B1 A1 M1	
		Obtain an	swer $4 - 3\sqrt{2}$		A1	[5]