	Paper Reference (complete below) Centre No. Surname	Initial(s)
	6663/01 Signature	
	Paper Reference(s) 66663	Examiner's use only
	Edexcel GCE	Team Leader's use or
	Core Methometics C1	
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	Advanced Subsidiary	Number Blar
	Mock Paper	1
		2
	Time: 1 hour 30 minutes	4
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	Materials required for examination <u>Items included with question papers</u>	7
	Mathematical Formulae Nil	8
		9
	Calculators may NOT be used in this examination.	10
nstructions to C n the boxes above ignature. You mu f you need more heets.	andidates e, write your centre number, candidate number, your surname, initials an lst write your answer for each question in the space following the question space to complete your answer to any question, use additional answer	d
Information for (A booklet 'Mathe Full marks may be This paper has ten	Candidates matical Formulae and Statistical Tables' is provided. e obtained for answers to ALL questions. questions.	
Advice to Candid	lates	
You must ensure t You must show su	hat your answers to parts of questions are clearly labelled. Ifficient working to make your methods clear to the examiner.	
	working may gain no credit.	Total

Success through qualifications

		Leave blank
1.	Solve the inequality	
	$10 + x^2 > x(x - 2)$.	
	(3)	

Leave blank Find $\int \left(x^2 - \frac{1}{x^2} + \sqrt[3]{x}\right) dx$. 2. (4)

		Leave
		blank
3.	Find the value of	
	(a) $81^{\frac{1}{2}}$	
	(d) 01 , (1)	
		,
	(b) $81\frac{3}{4}$	
	$(0) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	
	(2)	,
	$() 01^{-\frac{3}{4}}$	
	(c) 81^{+} .	
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4.	A sequence a_1, a_2, a_3, \dots is defined by	Leave blank
	$a_1 = k, a_{n+1} = 4 a_n - 7,$	
	where <i>k</i> is a constant.	
	(a) Write down an expression for a_2 in terms of k . (1)	
	(b) Find a_3 in terms of k, simplifying your answer. (2)	
	Given that $a_3 = 13$,	
	(c) find the value of k . (2)	

F		Show that aliminating a from the equations	Lea blar
5.	(a)	Snow that eliminating y from the equations	
		2x + y = 8,	
		$3x^2 + xy = 1$	
		produces the equation	
		$x^2 + 8x - 1 = 0. (2)$	
	(b)	Hence solve the simultaneous equations	
		2x + y = 8,	
		$3x^2 + xy = 1$	
		giving your answers in the form $a + b\sqrt{17}$, where a and b are integers. (5)	

ve k

5.	continued	Leave blank

6.	$f(x) = \frac{(2x+1)(x+4)}{\sqrt{x}}, x > 0.$	L b
	(a) Show that $f(x)$ can be written in the form $Px^{\frac{3}{2}} + Qx^{\frac{1}{2}} + Rx^{-\frac{1}{2}}$, stating the values of the constants <i>P</i> , <i>Q</i> and <i>R</i> . (3)	
	(b) Find f '(x). (3)	
	(c) Show that the tangent to the curve with equation $y = f(x)$ at the point where $x = 1$ is parallel to the line with equation $2y = 11x + 3$. (3)	

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7.	(a)	Factorise completely $x^3 - 4x$.	Ulalik
		(3)	
	(b)	Sketch the curve with equation $y = x^3 - 4x$, showing the coordinates of the points where the curve crosses the <i>x</i> -axis.	
		(3)	
	(c)	On a separate diagram, sketch the curve with equation	
		$y = (x - 1)^3 - 4(x - 1),$	
		showing the coordinates of the points where the curve crosses the x -axis. (3)	

7. continued

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8.	The straight line l_1 has equation $y = 3x - 6$.		Diank
	The straight line l_2 is perpendicular to l_1 and passes through the point (6, 2).		
	(a) Find an equation for l_2 in the form $y = mx + c$, where <i>m</i> and <i>c</i> are constants.	(3)	
	The lines l_1 and l_2 intersect at the point <i>C</i> .		
	(b) Use algebra to find the coordinates of <i>C</i> .	(3)	
	The lines l_1 and l_2 cross the x-axis at the points A and B respectively.		
	(c) Calculate the exact area of triangle <i>ABC</i> .	(4)	

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8	continued	UtallK
0.		

An	a arithmetic series has first term a and common difference d.	
(a)	Prove that the sum of the first <i>n</i> terms of the series is	
	$\frac{1}{2}n[2a+(n-1)d].$	
	2 (4)	
A j for	polygon has 16 sides. The lengths of the sides of the polygon, starting with the shortest side, rm an arithmetic sequence with common difference d cm.	
Th	e longest side of the polygon has length 6 cm and the perimeter of the polygon is 72 cm.	
Fir	nd	
(b)) the length of the shortest side of the polygon, (5)	
(c)) the value of d . (2)	
	()	

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9.	continued	
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10.	For the curve <i>C</i> with equation $y = f(x)$,	Leave blank
	$\frac{\mathrm{d}y}{\mathrm{d}x} = x^3 + 2x - 7.$	
	(a) Find $\frac{d^2 y}{dx^2}$. (2)	
	$d^2 y$	
	(b) Show that $\frac{d^2 y}{dx^2} \ge 2$ for all values of x.	
	(1)	
	Given that the point $P(2, 4)$ lies on C ,	
	(c) find y in terms of x, (\bullet)	
	(d) find an equation for the normal to C at P in the form $ax + by + c = 0$, where a, b and c are integers.	
	(5)	

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10.	continued	
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