

## crashMATHS -

C2 PAPERS PRACTICE PAPER C



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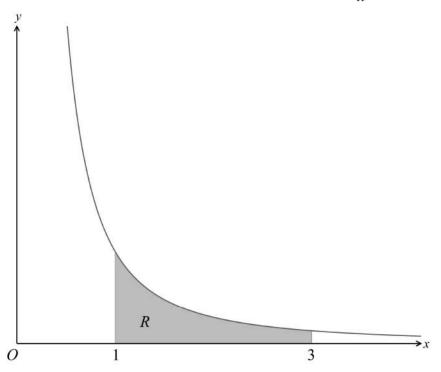
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1 The diagram below shows a sketch of the curve with equation  $y = \frac{2 + 3\sqrt{x}}{x^2}$ .



The region R is bounded by the x axis and the lines x = 1 and x = 3.

Calculate the area of R.

Give your answer in the forn	$p+q\sqrt{3}$ ,	where $p$	q are constants to be found.	(6)
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2 By considering the binomial expansion of	
$(1+x)^5$	
show that $(0.0712)^5$ is approximately $1.51 \times 10^{-9}$ .	(7)
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3 Solve	$\log_3(x^2 - 5x + 6) = \log_3(2x^2 + 26x + 60) + 2$	
		(5)
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4 The curve C has equation	
$y = \frac{x^4}{2} - 64x^2 + 5$	
(a) Find the $x$ coordinates of the stationary points on $C$ .	(4)
(b) Determine the nature of these stationary points.	(3)

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5	$U_1: a + ar + ar^2 + ar^3 + \dots$	
	$U_2: 2a + \frac{2a}{s} + \frac{2a}{s^2} + \frac{2a}{s^3} + \dots$	
	(a) State, in terms of $r$ and $n$ , the sum of the first $n$ terms of $U_1$ .	(1)
	(b) Find, in terms of $s$ , the sum to infinity of $U_2$ .	(3)
	Given that the sum of the first $n$ terms of $U_1$ is four times larger than the sum to infinity of $U_2$ ,	
	(c) Find $s$ in terms of $r$ .	(4)
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6 (a) Find a factor of $2x^3 + 3x^2 - 8x + 3$	(2)
(b) Hence, express $2x^3 + 3x^2 - 8x + 3$ as a product of three linear factors.	(5)
(c) Solve, for $0 < \theta \le 2\pi$ ,	
$4\sin^3 2\theta + 6\sin^2 2\theta - 16\sin 2\theta = -6$	
Give your answers in terms of $\pi$ .	(6)
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7 A circle C has the equation $(x-2)^2 + (y-4)^2 = 5^2$ .	
The tangent $T$ to the circle touches the circle at the point $P(6,7)$ .	
(a) Work out the equation of the line $T$ .	(5)
(b) Show, by sketching, that $T$ does not intersect $C$ a second time.	(2)
(c) Prove algebraically that $T$ does not intersect $C$ a second time.	(5)
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A triangle has sides a+b, a and a-b, where a>b>0. Let  $\alpha$  and  $\beta$  denote the largest and smallest angles of the triangle respectively. (a) By the use of the cosine rule, show that  $\cos\alpha = \frac{a-4b}{2(a-b)}$ (3) (b) By the use of the cosine rule, show also that  $\cos\beta = \frac{a+4b}{2(a+b)}$ (3) Given that  $\cos \beta = \frac{3}{4}$ , (c) Find a in terms of b. (3)(d) Hence, find the ratio of the lengths of the sides of the triangle. **(2)**  CM CM CM ĊM CM CM CM CM GM CM 0M CM GM. CM CM CM CM CM CM CM CM CMĊM CM GM. CM CM CM GM ĊM CM CM CM CM СM CM

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9 (a) Show that		
	$2.2^{x} 10^{2x} = 4^{x} 6^{2x}$	
	$\frac{3 \cdot 2^{x} \cdot 12^{2x} - 5 \cdot 4^{x} \cdot 6^{2x}}{2^{x} \cdot 6^{2x}} = 3 \cdot 2^{2x} - 5 \cdot 2^{x}$	(3)
	$2^x \cdot 6^{2x}$	
(b) Hence, or otherwise, so	lve	
(b) Hence, of otherwise, so		
	2	
	$\frac{3 \cdot 2^x \cdot 12^{2x} - 5 \cdot 4^x \cdot 6^{2x}}{2^x \cdot 6^{2x}} = 2$	(3)
	$2^x \cdot 6^{2x}$	(3)
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