

## crash**MATHS** -

C1 PAPERS PRACTICE PAPER A



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1 Find	
$\int (12x^{\frac{3}{4}} - 6(x + \frac{1}{x^2}) - 2) \ dx$	
giving each term in its simplest form.	(4)
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2 Express $\frac{4+2\sqrt{7}}{5-2\sqrt{7}}$ in the form $a+b\sqrt{7}$	(5)
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- 3 The curve y = f(x) is defined such that  $y = x^2(x-3)$ .
  - (a) In the space below, sketch the curve y = f(x).

(3)

On each sketch, you should clearly indicate the coordinates of any points where the curve crosses or meets the coordinate axis.

(b) Work out the gradient of the curve when x = -1.

**(4)** 

The tangent to the curve when x = -1 has equation ax + by + c = 0

(c) Calculate the values of a, b and c.

(3)

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4 Solve		
	$(3^{2x}) - 90(3^x) + 729 = 0$	(5)
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5	A sequence of numbers, $a_1, a_2, a_3$ is defined by	
	$a_1 = 2, a_2 = 6$	
	$a_{n+2} = 10a_{n+1} - a_n + x$	
	where $x$ is a positive constant.	
	(a) Find $\sum_{r=1}^{4} a_r$ in terms of $x$ .	(4)
	Given that $\sum_{r=1}^{4} a_r = 676$ ,	
	(b) Find the value of $x$ .	(2)
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6	Differentiate,	with res	pect to	X

(i) 
$$\frac{2}{3}(x-2x)(x-3)$$

(4)

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(ii) 
$$\frac{x^3 - 100x}{x^3 - 10x^2}$$

(5)

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7 John works in a water company and one of his jobs is to manage the level of water	
within a particular tank.	
The height of water, $d$ m, must be such that $d_1 < d < d_2$ .	
Given the conditions that	
$d^2 - 200d + 7500 < 0$	
2(d-200) > d-325	
Work out the value of $d_1$ and $d_2$ .	(7)
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8 The line $l_1$ has equation $y+8=2(x-4)$ .		
The $l_1$ crosses the x axis at the point A and the y axis at the point B.		
Another line $l_2$ is perpendicular to $l_1$ and passes through the midpoint of AB.		
The line $l_2$ crosses the $x$ axis at the point $C$ .		
Find the distance BC.	(8)	



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9 A curve is defined by	
$\frac{x+2y-4}{5} = \frac{x(2x+5)}{3} .$	
Show that the curve has two distinct real roots.	(6)



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Given that $\frac{dy}{dx} = 3x^2 + 10x - 5$ ,		
Work out the values of $a$ and $b$ .	1	



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11 Alice decides to donate a small proportion of her savings to charity each week. She				
saves £150 each week. In the first week, Alice donates £1.05, in the second week, she donates £1.15, in the third week, she donates £1.25, and so on, such that her donations follow an arithmetic progression.				
			Given that Alice donates $2.5\%$ of her earnings in the $n$ th week, calculate the total	
			amount she donates over the $n$ week period.	(8)
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