4.	$f(x) = 3x + x^3,$	x > 0.	
(a) Differentiate to find	f'(x).		
			(2)
Given that $f'(x) = 15$ ,			
(b) find the value of <i>x</i> .			(3)

0	
9.	The curve C has equation $y = kx^3 - x^2 + x - 5$ , where k is a constant.
	(a) Find $\frac{dy}{dx}$ .
	$\frac{dx}{dx}$
	The point A with x-coordinate $-\frac{1}{2}$ lies on C. The tangent to C at A is parallel to the line with equation $2y - 7x + 1 = 0$ .
	Find
	(b) the value of $k$ , (4)
	(c) the value of the y-coordinate of A. (2)

	Le bl
11. The gradient of a curve C is given by $\frac{dy}{dx} = \frac{(x^2 + 3)^2}{x^2}$ , $x \ne 0$ .	
(a) Show that $\frac{dy}{dx} = x^2 + 6 + 9x^{-2}$ .	
(a) Show that $\frac{1}{dx} - x + 6 + 9x$ .	(2)
The point $(2, 20)$ lies on $C$	
The point $(3, 20)$ lies on $C$ .	
(b) Find an equation for the curve C in the form $y = f(x)$ .	(0)
	(6)

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x	(2)
Given that $y = 5x - 7 + \frac{2\sqrt{x+3}}{x}$ , $x > 0$ ,	
(b) find $\frac{dy}{dx}$ , simplifying the coefficient of each term.	(4)

Find $\int (12x^5 - 8x^3 + 3) dx$ , giving each term in its simplest form.	. (4
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	(Total 4 marks

- 6. Given that  $\frac{2x^2 x^{\frac{3}{2}}}{\sqrt{x}}$  can be written in the form  $2x^p x^q$ ,
  - (a) write down the value of p and the value of q.

(2)

Given that  $y = 5x^4 - 3 + \frac{2x^2 - x^{\frac{3}{2}}}{\sqrt{x}}$ ,

(b) find  $\frac{dy}{dx}$ , simplifying the coefficient of each term.

(4)

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$$y = 4x^3 - 1 + 2x^{\frac{1}{2}}, \quad x > 0,$$

find  $\frac{\mathrm{d}y}{\mathrm{d}x}$ .

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\_\_\_\_\_ Q1

(Total 4 marks)

Differentiate with respect to <i>x</i>	
(a) $x^4 + 6\sqrt{x}$ ,	
	(3)
(b) $\frac{(x+4)^2}{x}$ .	
x	
	(4)

Find $\int (2+5x^2) dx$ .	(3)

Find $\int (3x^2 + 4x^5 - 7) dx$ .	(4)



4.	A curve has equation $y = f(x)$ and passes through the point (4, 22).
	Given that
	$f'(x) = 3x^2 - 3x^{\frac{1}{2}} - 7,$
	use integration to find $f(x)$ , giving each term in its simplest form.
	(5)
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$f'(x) = 3x^2 - 3x + 5$	
find the value of $f(1)$ .	
That the value of 1(1).	(5)



- **6.** Given that  $\frac{6x+3x^{\frac{5}{2}}}{\sqrt{x}}$  can be written in the form  $6x^p + 3x^q$ ,
  - (a) write down the value of p and the value of q.

**(2)** 

Given that  $\frac{dy}{dx} = \frac{6x + 3x^{\frac{5}{2}}}{\sqrt{x}}$ , and that y = 90 when x = 4,

(b) find y in terms of x, simplifying the coefficient of each term.

**(5)** 

		Lea
1. Find $\int (6x^2 + 2 + x^{-\frac{1}{2}}) dx$ , giving each term in its simplest form.	(4)	
	(4)	
		Q1
Г)	Total 4 marks)	

(a) $\frac{dy}{dx}$	
$\frac{dx}{dx}$	(3)
(b) $\int y  dx$	(3)

- 2. Given that  $y = 2x^5 + 7 + \frac{1}{x^3}$ ,  $x \ne 0$ , find, in their simplest form,
  - (a)  $\frac{\mathrm{d}y}{\mathrm{d}x}$ ,

(3)

(b)  $\int y \, dx$ .

**(4)** 








Given that $y = 3x^2 + 4\sqrt{x}$ , $x > 0$ , find	
(a) $\frac{\mathrm{d}y}{\mathrm{d}x}$ ,	(2)
(b) $\frac{d^2y}{dx^2}$ ,	
	(2)
(c) $\int y  dx$ .	
(c) $\int y  dx$ .	(3)
	(3)