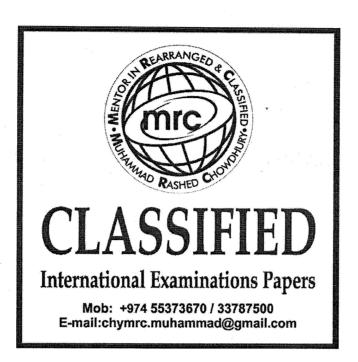
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## MODULAR MATHEMATICS/CORE-1 TOPIC-Integration Application

Given that		
	$f'(x) = 12x^2 - 8x + 1$	
find $f(x)$ .		
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8.	The curve	with equation $y$	= f(x) passes	through	the point (1,	6).	Given that
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$$f'(x) = 3 + \frac{5x^2 + 2}{x^{\frac{1}{2}}}, x > 0,$$

find f(x) and simplify your answer.

70-06



The curve C has equation y = f(x), x > 0, where

$$f'(x) = 30 + \frac{6 - 5x^2}{\sqrt{x}}$$

Given that the point P(4, -8) lies on C,

(a) find the equation of the tangent to C at P, giving your answer in the form y = mx + c, where m and c are constants.

**(4)** 

(b) Find f(x), giving each term in its simplest form.

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G	iven that	
	$f'(x) = 3x^2 - 3x^{\frac{1}{2}} - 7,$	
us	se integration to find $f(x)$ , giving each term in its simplest form.	
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7.	A curve with equation	v = f(x) passes	through the point	(2 10)	Given that
	redive with equation	y = I(x) passes	unough the point	(2, 10)	. Given that

$$f'(x) = 3x^2 - 3x + 5$$

find the value of f(1).

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$$\frac{\mathrm{d}y}{\mathrm{d}x} = 5x^{-\frac{1}{2}} + x\sqrt{x}, \qquad x > 0$$

Given that y = 35 at x = 4, find y in terms of x, giving each term in its simplest form.

(7)

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10. The curve C with equation y = f(x),  $x \ne 0$ , passes through the point  $(3, 7\frac{1}{2})$ .

Given that  $f'(x) = 2x + \frac{3}{x^2}$ ,

(a) find f(x).

JN-6
(5)

(b) Verify that f(-2) = 5.

**(1)** 

(c) Find an equation for the tangent to C at the point (-2, 5), giving your answer in the form ax + by + c = 0, where a, b and c are integers.

(4)



18



11. The curve C has equation y=f(x), x>0, where

$$\frac{\mathrm{d}y}{\mathrm{d}x} = 3x - \frac{5}{\sqrt{x}} - 2$$

Given that the point P(4, 5) lies on C, find

(a) f(x),

**(5)** 

(b) an equation of the tangent to C at the point P, giving your answer in the form ax+by+c=0, where a, b and c are integers.

**(4)** 



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<b>10.</b> A curve with equation $y = f(x)$	passes through the point (4, 25).
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Given that

$$f'(x) = \frac{3}{8}x^2 - 10x^{-\frac{1}{2}} + 1, \quad x > 0$$

(a) find f(x), simplifying each term.

JN-14

(5)

(b) Find an equation of the normal to the curve at the point (4, 25).

Give your answer in the form ax + by + c = 0, where a, b and c are integers to be found.

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7. The point P(4, -1) lies on the curve C with equation y = f(x), x > 0, and

$$f'(x) = \frac{1}{2}x - \frac{6}{\sqrt{x}} + 3$$

- JN-12
- (a) Find the equation of the tangent to C at the point P, giving your answer in the form y = mx + c, where m and c are integers.

**(4)** 

(b) Find f(x).

**(4)** 



7. The curve C has equation y = f(x),  $x \ne 0$ , and the point P(2, 1) lies on C. Given that

$$f'(x) = 3x^2 - 6 - \frac{8}{x^2},$$

20-07

(a) find f(x).

**(5)** 

(b) Find an equation for the tangent to C at the point P, giving your answer in the form y = mx + c, where m and c are integers.

**(4)** 



10



10.	A curve with equation $y = f(x)$	passes through the point (4, 9).
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Given that

$$f'(x) = \frac{3\sqrt{x}}{2} - \frac{9}{4\sqrt{x}} + 2, \quad x > 0$$

(a) find f(x), giving each term in its simplest form.

(5)

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Point P lies on the curve.

The normal to the curve at P is parallel to the line 2y + x = 0

(b) Find the x coordinate of P.

(5)

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6.	Given that $\frac{6x+3x^2}{}$	can be written in the form $6x^p + 3x^q$ ,
	$\sqrt{x}$	, ,

JN-11

(a) write down the value of p and the value of q.

**(2)** 

Leave blank

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)** 



7. (a) Show that  $\frac{(3-\sqrt{x})^2}{\sqrt{x}}$  can be written as  $9x^{-\frac{1}{2}} - 6 + x^{\frac{1}{2}}$ .

(2)

Given that  $\frac{dy}{dx} = \frac{(3 - \sqrt{x})^2}{\sqrt{x}}$ , x > 0, and that  $y = \frac{2}{3}$  at x = 1,

(b) find y in terms of x.

74-5

(6)

