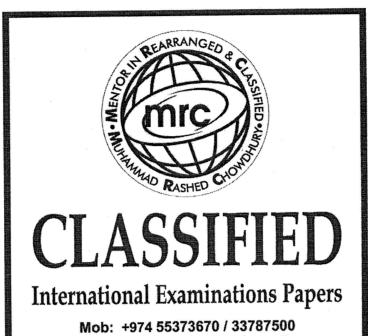
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MODULAR MATHEMATICS/CORE-1 TOPIC-Differentiation

1. Given that

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

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

70-07

(4)



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(Total 4 marks)

Q1

find the value of $\frac{dy}{dx}$ when x = 8, writing your answer in the form $a\sqrt{2}$, where a is a

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The second secon

1.	Given that	$y = x^4 + x^{\frac{1}{3}}$	+3,	find	$\frac{\mathrm{d}y}{\mathrm{d}x}$
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(3)

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(Total 3 marks)

$$y = 5x^3 - 6x^{\frac{4}{3}} + 2x - 3$$

(a) Find $\frac{dy}{dx}$ giving each term in its simplest form.

(4)

(b) Find
$$\frac{d^2y}{dx^2}$$

JN-12

(2)



- 5. Differentiate with respect to x
 - (a) $x^4 + 6\sqrt{x}$,

(3)

(b)
$$\frac{(x+4)^2}{x}$$

74-6

(4)



.....

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

(2)

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

Ja-09

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/4 ×	a dv				
(b)	find $\stackrel{\checkmark}{-}$.	simplifying	the coefficient	of each	term.
()	dr '	<i>7</i> - <i>8</i>		01 00011	

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5. (a) Write $\frac{2\sqrt{x+3}}{x}$ in the form $2x^p+3x^q$ where p and q are constants.

Ja-08 (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)



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Given that 7.

$$y = 3x^2 + 6x^{\frac{1}{3}} + \frac{2x^3 - 7}{3\sqrt{x}}, \quad x > 0$$

find $\frac{dy}{dx}$. Give each	ii toitii iii you	i aliswei i	n us simpi	med form.		

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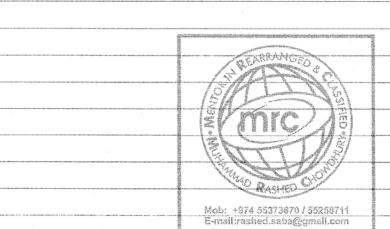
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LTIVAN	าทา
	Given

$$y = 8x^3 - 4\sqrt{x} + \frac{3x^2 + 2}{x}, \quad x > 0$$

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

JN-10

(6)



12



$$f(x) = \frac{\left(3 - 4\sqrt{x}\right)^2}{\sqrt{x}}, \quad x > 0$$

(a) Show that $f(x) = 9x^{-\frac{1}{2}} + Ax^{\frac{1}{2}} + B$, where A and B are constants to be found.

(3)

(b) Find f'(x).

(3)

(c) Evaluate f'(9).

(2)



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7. Differentiate with respect to x , giving each answer in its simplest form.				
(a) $(1-2x)^2$				
$\text{(b)} \frac{x^5 + 6\sqrt{x}}{2x^2}$		Jn-14	(3)	
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	$f(x) = 3x + x^3, x > 0.$		
(a) Differentiate to find $f'(x)$	c).	Ja- 8	(2)
Given that $f'(x) = 15$,			
(b) find the value of x .			(2)
			(3)
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