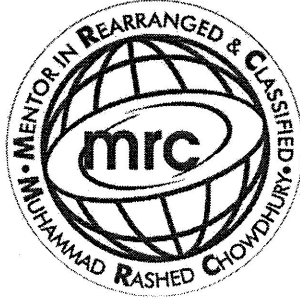


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**MODULAR
MATHEMATICS/CORE-1
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+97455258711

rashed.saba@gmail.com

7. The curve with equation $y = f(x)$ passes through the point $(-1, 0)$.

Given that

$$f'(x) = 12x^2 - 8x + 1$$

find $f(x)$.

(5)

7a-11



8. The curve with equation $y = f(x)$ passes through the point $(1, 6)$. Given that

$$f'(x) = 3 + \frac{5x^2 + 2}{x^{\frac{1}{2}}}, \quad x > 0,$$

find $f(x)$ and simplify your answer.

7a-06 (7)



7. 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. (5)

7-17



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)

Jan-09



7. A curve with equation $y = f(x)$ passes through the point $(2, 10)$. Given that

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

find the value of $f(1)$.

(5)

Ja-12



8.

$$\frac{dy}{dx} = -x^3 + \frac{4x-5}{2x^3}, \quad x \neq 0$$

Given that $y = 7$ at $x = 1$, find y in terms of x , giving each term in its simplest form.

(6)

Jan 13



4.

$$\frac{dy}{dx} = 5x^{-\frac{1}{2}} + x\sqrt{x}, \quad x > 0$$

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

(7)

. 70-110



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

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

(a) find $f(x)$.

7-6

(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)



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

7N-10

$$\frac{dy}{dx} = 3x - \frac{5}{\sqrt{x}} - 2$$

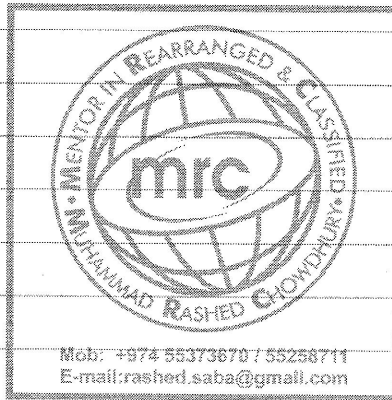
Given that the point $P(4, 5)$ lies on C , find

(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)



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

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

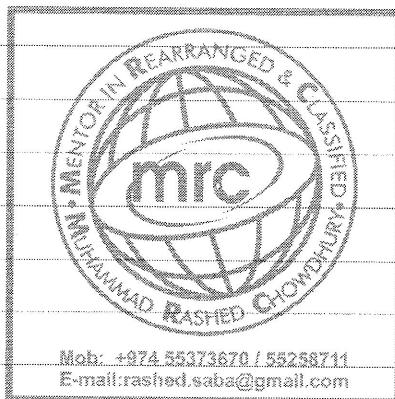
26-07

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

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)

74-15

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)

Lined writing area consisting of approximately 25 horizontal lines for student work.



6. Given that $\frac{6x+3x^{\frac{5}{2}}}{\sqrt{x}}$ can be written in the form $6x^p + 3x^q$,

74-11

(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)



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 . (6)

7-5

