

www.mrc-papers.com



CLASSIFIED

International Examinations Papers

Mob: +974 55249797 / 55258711

E-mail: rashed.saba@gmail.com

Pure Mathematics-1

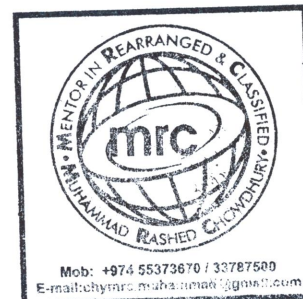
TOPIC- Differentiation

Gradient, Tangent, Normal

DIFFERENTIATION-gradient, tangents & normal

- 1 A curve has equation $y = \frac{k}{x}$. Given that the gradient of the curve is -3 when $x = 2$, find the value of the constant k . [3]

7-6



CLASSIFIED

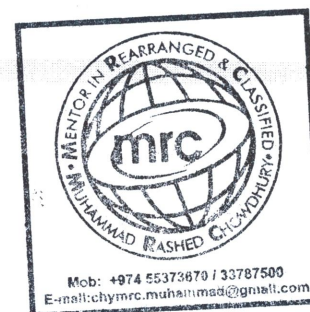
International Examinations Papers

www.mrc.muhammadrashed.com

DIFFERENTIATION-gradient, tangents & normal

2 Find the gradient of the curve $y = \frac{12}{x^2 - 4x}$ at the point where $x = 3$. 7-5

[4]



CLASSIFIED

International Examinations Papers

Mob: +974 55373670 / 33787500
E-mail: chymrc.muhammad@gmail.com

DIFFERENTIATION-gradient, tangents & normal

7-15-13
D

- 3 (i) Express $3x^2 - 6x + 2$ in the form $a(x + b)^2 + c$, where a , b and c are constants. [3]
- (ii) The function f , where $f(x) = x^3 - 3x^2 + 7x - 8$, is defined for $x \in \mathbb{R}$. Find $f'(x)$ and state, with a reason, whether f is an increasing function, a decreasing function or neither. [3]

N-15-13-3



CLASSIFIED

International Examinations Papers

Mob: +974 55373670 / 33787500
E-mail: chymrc.muhammad@gmail.com

DIFFERENTIATION-gradient, tangents & normal

4 A curve has equation $y = \frac{12}{3-2x}$.

N. 14-12-4

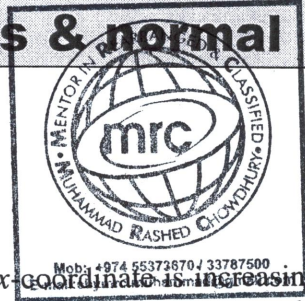
(i) Find $\frac{dy}{dx}$.

[2]

A point moves along this curve. As the point passes through A, the x -coordinate is increasing at a rate of 0.15 units per second and the y -coordinate is increasing at a rate of 0.4 units per second.

(ii) Find the possible x -coordinates of A.

[4]



CLASSIFIED

International Examinations Papers

Mob: +974 55373870 / 33787500

E-mail: mrc@international-examinations.com

DIFFERENTIATION-gradient, tangents & normal

- 05 A curve has equation $y = \frac{4}{(3x+1)^2}$. Find the equation of the tangent to the curve at the point where the line $x = -1$ intersects the curve. 7/14/11-4

[5]



CLASIFIED

International Examinations Papers

Mob: +974 55373670 / 33787500

E-mail: chymrc.muhammad@gmail.com

DIFFERENTIATION-gradient, tangents & normal

03. A curve has equation $y = \frac{4}{3x-4}$ and $P(2, 2)$ is a point on the curve. J-11-12-4

(i) Find the equation of the tangent to the curve at P .

[4]

(ii) Find the angle that this tangent makes with the x -axis.

[2]



CLASSIFIED

International Examinations Papers

DIFFERENTIATION-gradient, tangents & normal

7 The equation of a curve is $y = \frac{12}{x^2 + 3}$.

N-9-11-7



(i) Obtain an expression for $\frac{dy}{dx}$. [2]

(ii) Find the equation of the normal to the curve at the point $P(1, 3)$. [3]

(iii) A point is moving along the curve in such a way that the x -coordinate is increasing at a constant rate of 0.012 units per second. Find the rate of change of the y -coordinate as the point passes through P . [2]

Mob: +974 55373670 / 33787500
E-mail: hynrc.muhammad@gmail.com

CLASSIFIED

International Examinations Papers

Mob: +974 55373670 / 33787500

E-mail: hynrc.muhammad@gmail.com