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International Examinations Papers

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Pure Mathematics-1

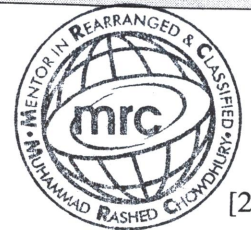# TOPIC- Differentiation

Successive

01 A curve has equation $y = \dfrac{1}{x-3} + x$.

N-W-13-5

(i) Find $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$. [2]

(ii) Find the coordinates of the maximum point A and the minimum point B on the curve. [5]

0 2 The equation of a curve is $y = (2x - 3)^3 - 6x$.

N-7-8

(i) Express $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$ in terms of x.

[3]

(ii) Find the x-coordinates of the two stationary points and determine the nature of each stationary point.

[5]

03 The equation of a curve is $y = 2x + \dfrac{8}{x^2}$.

(i) Obtain expressions for $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$. [3]

(ii) Find the coordinates of the stationary point on the curve and determine the nature of the stationary point. [3]

(iii) Show that the normal to the curve at the point $(-2, -2)$ intersects the x-axis at the point $(-10, 0)$. [3]

(iv) Find the area of the region enclosed by the curve, the x-axis and the lines $x = 1$ and $x = 2$. [3]

04   A curve has equation $y = x^2 + \dfrac{2}{x}$.   N - 4

(i) Write down expressions for $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$.   [3]

(ii) Find the coordinates of the stationary point on the curve and determine its nature.   [4]

(iii) Find the volume of the solid formed when the region enclosed by the curve, the x-axis and the lines $x = 1$ and $x = 2$ is rotated completely about the x-axis.   [6]

5 A curve has equation $y = \dfrac{8}{x} + 2x$.

N-15-11-5

(i) Find $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$.

(ii) Find the coordinates of the stationary points and state, with a reason, the nature of each stationary point.

[5]