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Pure Mathematics-1
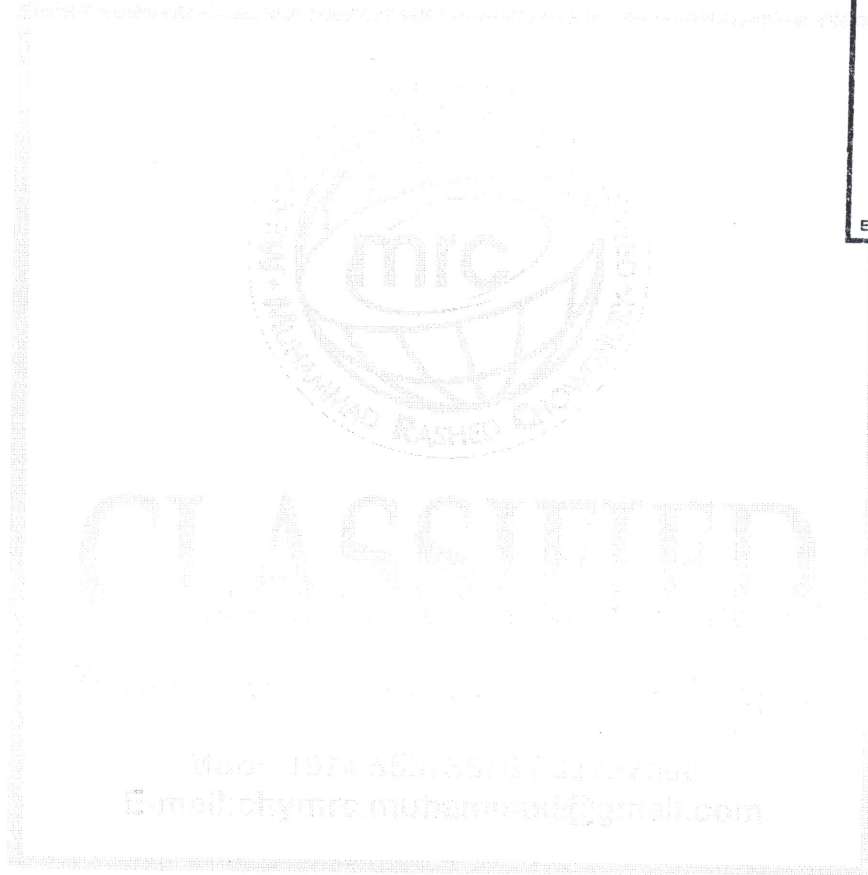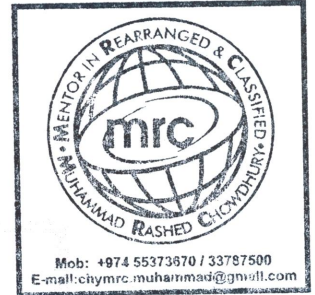# TOPIC- Differentiation
MIXED

1 The point $P(3, 5)$ lies on the curve $y = \dfrac{1}{x-1} - \dfrac{9}{x-5}$. $N-16-11-11$

   (i) Find the x-coordinate of the point where the normal to the curve at P intersects the x-axis.   [5]

   (ii) Find the x-coordinate of each of the stationary points on the curve and determine the nature of each stationary point, justifying your answers.   [6]
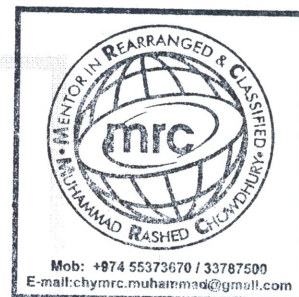
0 2   The equation of a curve is such that $\dfrac{d^2y}{dx^2} = 2x - 1$. Given that the curve has a minimum point at (3, –10), find the coordinates of the maximum point.   J-14-12-8   [8]

03 **(i)** A straight line passes through the point (2, 0) and has gradient m. Write down the equation of the line.

$N-11-13-7$ [1]

(ii) Find the two values of m for which the line is a tangent to the curve $y = x^2 - 4x + 5$. For each value of m, find the coordinates of the point where the line touches the curve. [6]

(iii) Express $x^2 - 4x + 5$ in the form $(x + a)^2 + b$ and hence, or otherwise, write down the coordinates of the minimum point on the curve. [2]