



[Glossary]
[Extreme Value & Power Series Representation of Function]

Subject:	Business Economics
Course:	B.A., 2 nd Semester, Undergraduate
Paper No. & Title:	Paper – 202 Mathematics for Business Economics
Unit No. & Title:	Unit - 3 Single variable Differentiation
Lecture No. & Title:	1: Extreme Value & power series Representation of Function

Glossary

Absolute Maxima: Refer the definition of Maxima.

Absolute Minima: Refer the definition of Minima.

Critical Point: Refer the definition of Stationary Point.

Differentiation: The process of finding derivative of a function is called Differentiation.

Derivative of a Function: Suppose f is a real function and c is a point in its domain. The derivative of f at c is defined as

$$\lim_{h \rightarrow 0} \frac{f(c+h) - f(c)}{h}, \text{ provided this limit exists. It is denoted by } f'(c) \text{ or } \left(\frac{d}{dx}(f(x)) \right)_{x=c}.$$

Extrema: Either Maxima or Minima.

Global Maxima: Refer the definition of Maxima.

Global Minima: Refer the definition of Minima.

Local Maxima: Refer the definition of Maxima.

Local Minima: Refer the definition of Minima.

Maclaurin's Series: Let $f: R \rightarrow R$ be a function. If f is infinitely many times differentiable at $x = 0$ then the Maclaurin's Series of f is

$$\text{given by } f(x) = f(0) + x \frac{f'(0)}{1!} + x^2 \frac{f''(0)}{2!} + x^3 \frac{f'''(0)}{3!} + \dots + x^r \frac{f^{(r)}(0)}{r!} + \dots$$

$$\text{i.e. } f(x) = \sum_{r=0}^{\infty} x^r \frac{f^{(r)}(0)}{r!}$$

Marginal Cost: Marginal cost is the change in the total cost that arises when the quantity produced is incremented by 1 unit. Also it is the ratio of change in variable cost to change in the quantity of goods.

Marginal Revenue: Marginal revenue is equal to the ratio of the change in revenue for some change in quantity sold to that change in quantity sold.

Marginal Profit: It's the difference between the marginal revenue and the marginal cost of producing one additional unit of output.

Maxima: Maxima of a function is the largest value of the function, either within a given range (the Local Maxima) or on the entire domain of a function (the Global or Absolute Maxima).

Minima: Minima of a function is the smallest value of the function, either within a given range (the Local Minima) or on the entire domain of a function (the Global or Absolute Minima).

Point of Inflexion: Inflexion points are the points on the curve at which the curve changes from being concave (concave down) to convex (concave up) or vice versa.

Stationary Point: A stationary point or a critical point of a differentiable function $f: A \rightarrow R$, $A \subset R$ of one variable is a point $a \in A$ where $f'(a) = 0$ (equivalently, the slope of the graph at that point is zero).

Taylor's Series: Let $f: R \rightarrow R$ be a function. If f is infinitely many times differentiable at $x = a$ then the Taylor's series of f at a is given by

$$f(x) = f(a) + (x-a) \frac{f'(a)}{1!} + (x-a)^2 \frac{f''(a)}{2!} + (x-a)^3 \frac{f'''(a)}{3!} + \dots + (x-a)^r \frac{f^{(r)}(a)}{r!} + \dots \text{i.e.}$$

$$f(x) = \sum_{r=0}^{\infty} (x-a)^r \frac{f^{(r)}(a)}{r!}$$

Total Revenue: It can be calculated as the selling price of the product times the quantity sold.