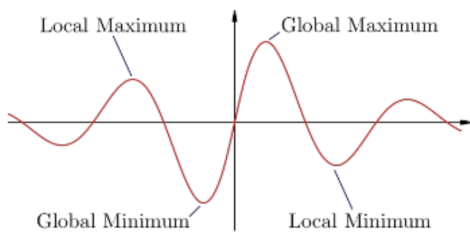


Maxima and Minima Using Derivatives

Wednesday, 23 July 2025 6:56 PM



We use those concept for finding Local minima (Small Error)

Ex \rightarrow $f(x) = 3x^3 - 9x^2 - 27x + 15$

Step ① - Find $f'(x)$

$$f'(x) = 9x^2 - 18x - 27$$

Step ② - Put $f'(x) = 0$ and find the value of x .

$$f'(x) = 9x^2 - 18x - 27$$

$$9x^2 - 18x - 27 = 0$$

$$x^2 - 2x - 3 = 0$$

$$x^2 + x - 3x - 3 = 0$$

$$x(x+1) - 3(x+1) = 0$$

$$(x+1)(x-3)$$

$$x = -1, 3$$

Step ③ - Put x values in $f(x)$

Putting $x = 3$

$$f(3) = 3 \times 27 - 9 \times 9 - 27 \times 3 + 15$$

$$f(3) = -18$$

$$f(3) = -\infty \quad \text{minimum value}$$

$$\text{Putting } x = -1$$

$$f(-1) = -3 - 9 + 27 + 15$$

$$f(-1) = 30 \quad \text{Maxima value.}$$