TAYLOR EXPANSION

Taylor series

Definition

Let I be an interval $f: I \to \mathbb{R}$ an arbitrary differentiable function, then the infinite series:

$$T_f(x) = f(a) + f'(a)(x - a) + \frac{f''(a)}{2!}(x - a)^2 + \ldots$$

$$T_f(x) = \sum_{k=0}^{\infty} \frac{f_a^{(k)}}{k!}(x - a)^k$$

is the Taylor expansion of f around the point a. For $(x - a)$ being small, one can stop the Taylor expansion after a certain n^{th} element and obtain thus the approximation of the function f around the point a.