

POWER SERIES

An infinite series of the form variable

$$f(x) = \sum_{n=0}^{\infty} C_n(x-a)^n = C_0 + C_1(x-a) + C_2(x-a)^2 + \dots$$

is called a power series centered at a with coefficients $C_0, C_1, C_2, \dots = \{C_n\}_{n=0}^{\infty}$.

Questions:

- ① For which values of x does the series converge?
Convergence Domain?
- ② If $f(x)$ represents the value of the sum for each x that is in the convergence domain, what properties does $f(x)$ have?

Basic Property of Power Series: If the series converges for $x = x_1$, then it converges for all x satisfying

$$|x-a| < |x_1-a| = d$$

$$-d < x-a < d$$

$$a-d < x < a+d$$

