

Series

$$\frac{1}{1-x} = 1 + x + x^2 + \dots = \sum_{k=0}^{\infty} x^k \quad |x| < 1$$

$$\frac{1}{1+x} = 1 - x + x^2 - \dots = \sum_{k=0}^{\infty} (-1)^k x^k \quad |x| < 1$$

$$e^x = 1 + x + \frac{x^2}{2!} + \dots = \sum_{k=0}^{\infty} \frac{x^k}{k!}$$

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k+1}}{(2k+1)!}$$

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \dots = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k}}{(2k)!}$$

$$\log(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \dots = \sum_{k=1}^{\infty} (-1)^{k-1} \frac{x^k}{k} \quad -1 < x \leq 1$$

$$\tan^{-1} x = x - \frac{x^3}{3} + \frac{x^5}{5} - \dots = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k+1}}{2k+1} \quad |x| \leq 1$$

$$\sinh x = \sum_{k=0}^{\infty} \frac{x^{2k+1}}{(2k+1)!}$$

$$\cosh x = \sum_{k=0}^{\infty} \frac{x^{2k}}{(2k)!}$$