SOME IMPORTANT TAYLOR SERIES

Taylor series	Radius of convergence
$e^x = \sum_{n=0}^{\infty} \frac{1}{n!} x^n = \sum_{n=0}^{\infty} \frac{x^n}{n!} = 1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \ldots$	Radius of convergence: ∞ expansion is valid for all x
$\frac{1}{1-x} = \sum_{n=0}^{\infty} x^n = 1 + x + x^2 + \ldots$	Radius of convergence: 1 expansion is valid for $-1 < x < 1$
$\frac{1}{1+x} = \sum_{n=0}^{\infty} (-1)^n x^n = 1 - x + x^2 - x^3 + \ldots$	Radius of convergence: 1 expansion is valid for $-1 < x < 1$
$\sin x = \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!} x^{2n+1} = x - \frac{x^3}{6} + \frac{x^5}{120} - \ldots$	Radius of convergence: ∞ the expansion is valid for all x
$\cos x = \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!} x^{2n} = 1 - \frac{x^2}{2} + \frac{x^4}{24} - \ldots$	Radius of convergence: ∞ expansion is valid for all x
$\ln(1-x) = -\sum_{n=1}^{\infty} \frac{1}{n} x^n = -x - \frac{x^2}{2} - \frac{x^3}{3} - \ldots$	Radius of convergence: 1 expansion is valid for $-1 < x < 1$