TAYLOR & MCLAURIN SERIES

Polynomial approximations for x→0

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\begin{aligned}
e^x &= 1 + x + \frac{x^2}{2} + \cdots + \frac{x^n}{n!} + o(x^n) \\
\log(1+x) &= x - \frac{x^2}{2} + \frac{x^3}{3} + \cdots + (-1)^{n+1}\frac{x^n}{n} + o(x^n) \\
(1+x)^a &= 1 + ax + \frac{a(a-1)}{2}x^2 + \cdots + \binom{a}{n} x^n + o(x^n) \qquad \text{dove } \binom{a}{n} = \frac{a(a-1)\ldots(a-n+1)}{n!} \\
\sin x &= x - \frac{x^3}{3!} + \frac{x^5}{5!} + \cdots + (-1)^n \frac{x^{2n+1}}{(2n+1)!} + o(x^{2n+2}) \\
\cos x &= 1 - \frac{x^2}{2!} + \frac{x^4}{4!} + \cdots + (-1)^n \frac{x^{2n}}{(2n)!} + o(x^{2n+1}) \\
\tan x &= x + \frac{x^3}{3} + \frac{2}{15}x^5 + \cdots + o(x^6) \\
\sinh x &= x + \frac{x^3}{3!} + \frac{x^5}{5!} + \cdots + \frac{x^{2n+1}}{(2n+1)!} + o(x^{2n+2}) \\
\cosh x &= 1 + \frac{x^2}{2!} + \frac{x^4}{4!} + \cdots + \frac{x^{2n}}{(2n)!} + o(x^{2n+1}) \\
\tanh x &= x - \frac{x^3}{3} + \frac{2}{15}x^5 + o(x^6) \\
\arcsin x &= x + \frac{1}{6}x^3 + \frac{3}{40}x^5 + \cdots + \frac{(2n)!}{4^n(n!)^2(2n+1)}x^{2n+1} + o(x^{2n+2}) \\
\arctan x &= x - \frac{x^3}{3} + \frac{x^5}{5} + \cdots + (-1)^n \frac{x^{2n+1}}{2n+1} + o(x^{2n+2}) \\
\text{arsinh } x &= x - \frac{1}{6}x^3 + \frac{3}{40}x^5 + \cdots + \frac{(-1)^n(2n)!}{4^n(n!)^2(2n+1)}x^{2n+1} + o(x^{2n+2}) \\
\text{artanh } x &= x + \frac{x^3}{3} + \frac{x^5}{5} + \cdots + \frac{x^{2n+1}}{2n+1} + o(x^{2n+2})
\end{aligned}
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