Développements limités usuels en 0

$$e^x = 1 + x + \cdots + \frac{x^n}{n!} + o(x^n)$$

$$\cos x = 1 - \frac{x^2}{2} + \frac{x^4}{24} - \cdots + \frac{(-1)^n x^{2n}}{(2n)!} + \left| \begin{array}{l} o\left(x^{2n}\right) \\ \\ o\left(x^{2n+1}\right) \end{array} \right.$$

$$\sin x = x - \frac{x^3}{6} + \frac{x^5}{120} - \cdots + \frac{(-1)^n x^{2n+1}}{(2n+1)!} + \left| \begin{array}{l} o\left(x^{2n+1}\right) \\ \\ o\left(x^{2n+2}\right) \end{array} \right.$$

$$\operatorname{ch} x = 1 + \frac{x^2}{2} + \frac{x^4}{24} + \cdots + \frac{x^{2n}}{(2n)!} + \left| \begin{array}{l} o\left(x^{2n}\right) \\ \\ o\left(x^{2n+1}\right) \end{array} \right.$$

$$\operatorname{sh} x = x + \frac{x^3}{6} + \frac{x^5}{120} + \cdots + \frac{x^{2n+1}}{(2n+1)!} + \left| \begin{array}{l} o\left(x^{2n+1}\right) \\ \\ o\left(x^{2n+2}\right) \end{array} \right.$$

$$(1+x)^\alpha = 1 + \alpha x + \frac{\alpha(\alpha-1)}{2}x^2 + \cdots + \underbrace{\frac{\alpha(\alpha-1)\cdots(\alpha-n+1)}{n!}}_{\text{noté } \binom{\alpha}{n}} x^n + o(x^n)$$

$$\operatorname{Arctan} x = x - \frac{x^3}{3} + \cdots + \frac{(-1)^n}{2n+1}x^{2n+1} + o\left(x^{2n+1}\right)$$

$$\frac{1}{1-x} = 1 + x + \cdots + x^n + o(x^n)$$

$$\frac{1}{1+x} = 1 - x + \cdots + (-1)^n x^n + o(x^n)$$

$$\ln(1-x) = -x - \frac{x^2}{2} - \cdots - \frac{x^n}{n} + o(x^n)$$

$$\ln(1+x) = x - \frac{x^2}{2} + \cdots + (-1)^{n-1}\frac{x^n}{n} + o(x^n)$$

$$\tan x = x + \frac{x^3}{3} + \frac{2x^5}{15} + \frac{17x^7}{315} + o\left(x^7\right)$$

$$\operatorname{th} x = x - \frac{x^3}{3} + \frac{2x^5}{15} - \frac{17x^7}{315} + o\left(x^7\right)$$

Développement limité fort *: lorsque le terme en x^{n+1} existe, on peut remplacer $o(x^n)$ par $O\left(x^{n+1}\right)$.*