Développements limités en 0 des fonctions usuelles

$$e^x \underset{x\to 0}{=} \sum_{k=0}^{n} \frac{x^k}{k!} + o(x^n)$$
$$\underset{x\to 0}{=} 1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \dots + \frac{x^n}{n!} + o(x^n)$$

$$\cos x \underset{x\to 0}{=} \sum_{k=0}^{n} (-1)^k \frac{x^{2k}}{(2k)!} + o(x^{2n+1})$$
$$\underset{x\to 0}{=} 1 - \frac{x^2}{2} + \frac{x^4}{24} + \dots + (-1)^n \frac{x^{2n}}{(2n)!} + o(x^{2n+1})$$

$$\sin x \underset{x\to 0}{=} \sum_{k=0}^{n} (-1)^k \frac{x^{2k+1}}{(2k+1)!} + o(x^{2n+2})$$
$$\underset{x\to 0}{=} x - \frac{x^3}{6} + \dots + (-1)^n \frac{x^{2n+1}}{(2n+1)!} + o(x^{2n+2})$$

$$\operatorname{ch} x \underset{x\to 0}{=} \sum_{k=0}^{n} \frac{x^{2k}}{(2k)!} + o(x^{2n+1})$$
$$\underset{x\to 0}{=} 1 + \frac{x^2}{2} + \frac{x^4}{24} + \dots + \frac{x^{2n}}{(2n)!} + o(x^{2n+1})$$

$$\operatorname{sh} x \underset{x\to 0}{=} \sum_{k=0}^{n} \frac{x^{2k+1}}{(2k+1)!} + o(x^{2n+2})$$
$$\underset{x\to 0}{=} x + \frac{x^3}{6} + \dots + \frac{x^{2n+1}}{(2n+1)!} + o(x^{2n+2})$$

$$(1+x)^\alpha \underset{x\to 0}{=} 1 + \sum_{k=1}^{n} \alpha(\alpha-1)\dots(\alpha-k+1)\frac{x^k}{k!} + o(x^n)$$
$$\underset{x\to 0}{=} 1 + \alpha x + \alpha(\alpha-1)\frac{x^2}{2} + \dots + \alpha(\alpha-1)\dots(\alpha-n+1)\frac{x^n}{n!} + o(x^n)$$

$$\frac{1}{1+x} \underset{x\to 0}{=} \sum_{k=0}^{n} (-1)^k x^k + o(x^n)$$
$$\underset{x\to 0}{=} 1 - x + x^2 + \dots + (-1)^n x^n + o(x^n)$$

$$\frac{1}{1-x} \underset{x\to 0}{=} \sum_{k=0}^{n} x^k + o(x^n)$$
$$\underset{x\to 0}{=} 1 + x + x^2 + \dots + x^n + o(x^n)$$

$$\ln(1+x) \underset{x\to 0}{=} \sum_{k=1}^{n} (-1)^{k-1} \frac{x^k}{k} + o(x^n)$$
$$\underset{x\to 0}{=} x - \frac{x^2}{2} + \frac{x^3}{3} + \dots + (-1)^{n-1} \frac{x^n}{n} + o(x^n)$$

$$\ln(1-x) \underset{x\to 0}{=} -\sum_{k=1}^{n} \frac{x^k}{k} + o(x^n)$$
$$\underset{x\to 0}{=} -x - \frac{x^2}{2} - \frac{x^3}{3} + \dots - \frac{x^n}{n} + o(x^n)$$

$$\operatorname{Arctan} x \underset{x\to 0}{=} \sum_{k=0}^{n} (-1)^k \frac{x^{2k+1}}{2k+1} + o(x^{2n+2})$$
$$\underset{x\to 0}{=} x - \frac{x^3}{3} + \dots + (-1)^n \frac{x^{2n+1}}{2n+1} + o(x^{2n+2})$$

$$\tan x \underset{x\to 0}{=} x + \frac{1}{3}x^3 + \frac{2}{15}x^5 + o(x^6)$$