DL usuels en 0

- $e^x = 1 + x + \frac{x^2}{2} + \frac{x^3}{3!} + \dots + \frac{x^n}{n!} + o(x^n)$

$$= \sum_{k=0}^{n} \frac{x^k}{k!} + o(x^n)$$

- $sh(x) = x + \frac{x^3}{3!} + \dots + \frac{x^{2n+1}}{(2n+1)!} + o(x^{2n+2})$

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

- $ch(x) = 1 + \frac{x^2}{2} + \frac{x^4}{4!} + \dots + \frac{x^{2n}}{(2n)!} + o(x^{2n+1})$

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

- $th(x) = x - \frac{x^3}{3} + o(x^4)$

- $\sin(x) = x - \frac{x^3}{3!} + \dots + (-1)^n \frac{x^{2n+1}}{(2n+1)!} + o(x^{2n+2})$

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

- $\cos(x) = 1 - \frac{x^2}{2} + \frac{x^4}{4!} + \dots + (-1)^n \frac{x^{2n}}{(2n)!} + o(x^{2n+1})$

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

- $\tan(x) = x + \dfrac{x^3}{3} + o(x^4)$

- $\ln(1+x) = x - \dfrac{x^2}{2} + \dfrac{x^3}{3} + \dots + (-1)^{n-1}\dfrac{x^n}{n} + o(x^n)$

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

- $\dfrac{1}{1+x} = 1 - x + x^2 - x^3 + \dots + (-1)^n x^n + o(x^n)$

$$= \sum_{k=0}^{n} (-1)^k x^k + o(x^n)$$

- $(1+x)^\alpha = 1 + \alpha x + \dfrac{\alpha(\alpha-1)}{2!}x^2 + \dots + \dfrac{\alpha(\alpha-1)\cdots(\alpha-n+1)}{n!}x^n$
$+ o(x^n)$

$$= \sum_{k=0}^{n} \binom{\alpha}{k} x^k + o(x^n)$$

- $\arctan(x) = x - \dfrac{x^3}{3} + \dots + \dfrac{(-1)^n x^{2n+1}}{2n+1} + o(x^{2n+2})$

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