Séries

Développements en série entière usuels

$$\forall z \in \mathbb{C},\ e^z = \sum_{n=0}^{+\infty} \frac{z^n}{n!}$$

$$\forall x \in \mathbb{R},\ \mathrm{ch}(x) = \sum_{n=0}^{+\infty} \frac{x^{2n}}{(2n)!}$$

$$\forall x \in \mathbb{R},\ \mathrm{sh}(x) = \sum_{n=0}^{+\infty} \frac{x^{2n+1}}{(2n+1)!}$$

$$\forall x \in \mathbb{R},\ \cos(x) = \sum_{n=0}^{+\infty} \frac{(-1)^n x^{2n}}{(2n)!}$$

$$\forall x \in \mathbb{R},\ \sin(x) = \sum_{n=0}^{+\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$$

$$\forall x \in]-1,1[,\ \arctan(x) = \sum_{n=0}^{+\infty} \frac{(-1)^n x^{2n+1}}{2n+1}$$

$$\forall z \in \mathbb{C},\ |z| < 1 \implies \frac{1}{1-z} = \sum_{n=0}^{+\infty} z^n$$

$$\forall x \in]-1,1[,\ \ln(1+x) = \sum_{n=1}^{+\infty} \frac{(-1)^{n-1} x^n}{n}$$

$$\forall x \in]-1,1[,\ (1+x)^\alpha = \sum_{n=0}^{+\infty} \binom{\alpha}{n} x^n$$

$$\text{avec } \binom{\alpha}{n} = \frac{1}{n!} \prod_{k=0}^{n-1} (\alpha - k)$$