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Séries

Développements en série entière usuels

$$\forall z \in \mathbb{C}, \ e^{z} = \sum_{n=0}^{+\infty} \frac{z^{n}}{n!} \qquad \forall x \in \mathbb{R}, \ \operatorname{ch}(x) = \sum_{n=0}^{+\infty} \frac{x^{2n}}{(2n)!}$$

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

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

$$\forall x \in \mathbb{C}, \ |z| < 1 \implies \frac{1}{1-z} = \sum_{n=0}^{+\infty} z^{n} \qquad \forall x \in]-1, 1[, \ \ln(1+x) = \sum_{n=1}^{+\infty} \frac{(-1)^{n-1} x^{n}}{n}$$

$$\forall x \in]-1, 1[, \ (1+x)^{\alpha} = \sum_{n=0}^{+\infty} \binom{\alpha}{n} x^{n} \qquad \operatorname{avec} \binom{\alpha}{n} = \frac{1}{n!} \prod_{k=0}^{n-1} (\alpha - k)$$