Développements en série entière

Groupe : Exponentielle

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\begin{aligned}
e^x &= 1+x+\frac{x^2}{2!}+\cdots+\frac{x^n}{n!}+\ldots && R=+\infty\\
\sin x &= x-\frac{x^3}{3!}+\cdots+(-1)^n\frac{x^{2n+1}}{(2n+1)!}+\ldots && R=+\infty\\
\cos x &= 1-\frac{x^2}{2!}+\cdots+(-1)^n\frac{x^{2n}}{(2n)!}+\ldots && R=+\infty\\
\cosh x &= 1+\frac{x^2}{2!}+\cdots+\frac{x^{2n}}{(2n)!}+\ldots && R=+\infty\\
\sinh x &= x+\frac{x^3}{3!}+\cdots+\frac{x^{2n+1}}{(2n+1)!}+\ldots && R=+\infty
\end{aligned}
$$

Groupe : Séries géométriques

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\begin{aligned}
\frac{1}{1-x} &= 1+x+x^2+\cdots+x^n+\ldots && R=1\\
\frac{1}{1+x} &= 1-x+x^2+\cdots+(-1)^n x^n+\ldots && R=1\\
\ln(1-x) &= -x-\frac{x^2}{2}-\cdots-\frac{x^n}{n}+\ldots && R=1\\
\ln(1+x) &= x-\frac{x^2}{2}+\cdots+(-1)^{n-1}\frac{x^n}{n}+\ldots && R=1\\
\arctan x &= x-\frac{x^3}{3}+\cdots+(-1)^n\frac{x^{2n+1}}{2n+1}+\ldots && R=1\\
\operatorname{arctanh} x &= x+\frac{x^3}{3}+\cdots+\frac{x^{2n+1}}{2n+1}+\ldots && R=1
\end{aligned}
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Groupe : Binôme

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\begin{aligned}
(1+x)^\alpha &= 1+\alpha x+\cdots+\alpha(\alpha-1)\ldots(\alpha-n+1)\frac{x^n}{n!}+\ldots && R=1\\
\arcsin x &= x+\frac{x^3}{6}+\cdots+\frac{(2n)!}{2^{2n}(n!)^2}\frac{x^{2n+1}}{2n+1}+\ldots && R=1\\
\operatorname{arcsinh} x &= x-\frac{x^3}{6}+\cdots+(-1)^n\frac{(2n)!}{2^{2n}(n!)^2}\frac{x^{2n+1}}{2n+1}+\ldots && R=1
\end{aligned}
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