

Formulaire de développements limités

$$f(x) \approx f(a) + f'(a)(x-a) + f''(a)\frac{(x-a)^2}{2} + \dots + f^{(n)}(a)\frac{(x-a)^n}{n!}$$

$$(1+x)^\alpha = 1 + \alpha x + \frac{\alpha(\alpha-1)}{2!}x^2 + \dots + \frac{\alpha(\alpha-1)\dots(\alpha-n+1)}{n!}x^n + 0(x^{n+1})$$

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots + \frac{x^n}{n!} + 0(x^{n+1})$$

$$\ln(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \dots + \frac{(-1)^{n-1}x^n}{n} + 0(x^{n+1})$$

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \dots + \frac{(-1)^n x^{2n}}{(2n)!} + 0(x^{2n+1})$$

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots + \frac{(-1)^n x^{2n+1}}{(2n+1)!} + 0(x^{2n+2})$$

$$\tan x = x + \frac{x^3}{3} + \frac{2}{15}x^5 + 0(x^5)$$

$$\arcsin x = x + \frac{1}{2} \frac{x^3}{3} + \frac{1 \times 3}{2 \times 4} \frac{x^5}{5} + \frac{1 \times 3 \times 5}{2 \times 4 \times 6} \frac{x^7}{7} + 0(x^7)$$

$$\arctan x = x - \frac{x^3}{3} + \frac{x^5}{5} - \dots + \frac{(-1)^n x^{2n+1}}{(2n+1)} + 0(x^{2n+2})$$

$$\cosh x = 1 + \frac{x^2}{2!} + \frac{x^4}{4!} + \dots + \frac{x^{2n}}{(2n)!} + 0(x^{2n+1})$$

$$\sinh x = x + \frac{x^3}{3!} + \frac{x^5}{5!} - \dots + \frac{x^{2n+1}}{(2n+1)!} + 0(x^{2n+2})$$

$$\tanh x = x - \frac{x^3}{3} + \frac{2}{15}x^5 + 0(x^5)$$

$$\operatorname{arcsinh} x = x - \frac{1}{2} \frac{x^3}{3} + \frac{1 \times 3}{2 \times 4} \frac{x^5}{5} - \frac{1 \times 3 \times 5}{2 \times 4 \times 6} \frac{x^7}{7} + 0(x^7)$$

$$\operatorname{arctanh} x = x + \frac{x^3}{3} + \frac{x^5}{5} + \dots + \frac{x^{2n+1}}{(2n+1)} + 0(x^{2n+2})$$