Primitives usuelles

Les relations ne sont valables que sur des intervalles sur lesquels la fonction à intégrer est continue.

1. **Puissances :** si α et β sont complexes, $\alpha \neq -1$ et $\beta \neq 1$:

$$\int x^\alpha dx = \frac{x^{\alpha+1}}{\alpha+1} + C^{te} \qquad \int \frac{dx}{x^\beta} = \frac{-1}{\beta-1}\,\frac{1}{x^{\beta-1}} + C^{te}$$

$$\int \frac{dx}{x} = \ln|x| + C^{te}$$

2. **Exponentielles :** si α est un complexe non nul et $a \in]0,1[\cup]1,+\infty[$:

$$\int e^{\alpha x} dx = \frac{e^{\alpha x}}{\alpha} + C^{te} \qquad \int a^x dx = \frac{a^x}{\ln a} + C^{te}$$

3. **Fonctions trigonométriques**

$$\int \cos x\, dx = \sin x + C^{te} \qquad \int \sin x\, dx = -\cos x + C^{te}$$

$$\int \tan x\, dx = -\ln|\cos x| + C^{te} \qquad \int \operatorname{cotan} x\, dx = \ln|\sin x| + C^{te}$$

$$\int \frac{dx}{\cos^2 x} = \tan x + C^{te} \qquad \int \frac{dx}{\sin^2 x} = -\operatorname{cotan} x + C^{te}$$

4. **Fonctions hyperboliques**

$$\int \operatorname{ch} x\, dx = \operatorname{sh} x + C^{te} \qquad \int \operatorname{sh} x\, dx = \operatorname{ch} x + C^{te}$$

$$\int \frac{dx}{\operatorname{ch}^2 x} = \operatorname{th} x + C^{te}$$

5. **Fonctions algébriques**

$$\int \frac{dx}{1+x^2} = \arctan x + C^{te} \qquad \int \frac{dx}{\sqrt{1-x^2}} = \arcsin x + C^{te}$$

$$\int \frac{dx}{\sqrt{x^2+1}} = \ln\left(x + \sqrt{x^2+1}\right) + C^{te} \qquad \int \frac{dx}{\sqrt{x^2-1}} = \ln\left|x + \sqrt{x^2-1}\right| + C^{te}$$

$$\int \frac{dx}{x^2-1} = \frac{1}{2}\ln\left|\frac{x-1}{x+1}\right| + C^{te}$$

Remarque : si $a > 0$, alors on a

$$\int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{a} + C^{te}$$

$$\int \frac{dx}{x^2+a^2} = \frac{1}{a}\arctan\frac{x}{a} + C^{te} \qquad \int \frac{dx}{x^2-a^2} = \frac{1}{2a}\ln\left|\frac{x-a}{x+a}\right| + C^{te}$$

$$\int \frac{dx}{\sqrt{x^2+a^2}} = \ln\left(x + \sqrt{x^2+a^2}\right) + C^{te} \qquad \int \frac{dx}{\sqrt{x^2-a^2}} = \ln\left|x + \sqrt{x^2-a^2}\right| + C^{te}$$