Primitives usuelles

C désigne une constante arbitraire. Les intervalles d'étude sont à préciser.

$$\int e^{\alpha x}\mathrm{d}x = \frac{1}{\alpha}\, e^{\alpha x} + C \qquad (\alpha \in \mathbb{C}^*)$$

$$\int x^{\alpha}\mathrm{d}x = \frac{1}{\alpha+1}\, x^{\alpha+1} + C \qquad (\alpha \neq -1)$$

$$\int \frac{\mathrm{d}x}{x^2+a^2} = \frac{1}{a}\arctan\frac{x}{a} + C \qquad (a \neq 0)$$

$$\int \frac{\mathrm{d}x}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{a} + C \qquad (a > 0)$$

$$\int \cos x\mathrm{d}x = \sin x + C$$

$$\int \sin x\mathrm{d}x = -\cos x + C$$

$$\int \tan x\mathrm{d}x = -\ln|\cos x| + C$$

$$\int \cot x\mathrm{d}x = \ln|\sin x| + C$$

$$\int \frac{\mathrm{d}x}{\cos^2 x} = \tan x + C$$

$$\int \frac{\mathrm{d}x}{\sin^2 x} = -\cot x + C$$

$$\int \frac{\mathrm{d}x}{\cos x} = \frac{1}{2}\ln\left(\frac{1+\sin x}{1-\sin x}\right) + C$$

$$\int \frac{\mathrm{d}x}{\sin x} = \frac{1}{2}\ln\left(\frac{1-\cos x}{1+\cos x}\right) + C$$

$$\int \frac{\mathrm{d}x}{x} = \ln|x| + C$$

$$\int \ln x\mathrm{d}x = x\ln x - x + C$$

$$\int \frac{\mathrm{d}x}{x^2-a^2} = \frac{1}{2a}\ln\left|\frac{x-a}{x+a}\right| + C \qquad (a \neq 0)$$

$$\int \frac{\mathrm{d}x}{\sqrt{x^2+\alpha}} = \ln\left|x+\sqrt{x^2+\alpha}\right| + C \qquad (\alpha \neq 0)$$

$$\int \mathrm{ch}\, x\mathrm{d}x = \mathrm{sh}\, x + C$$

$$\int \mathrm{sh}\, x\mathrm{d}x = \mathrm{ch}\, x + C$$

$$\int \mathrm{th}\, x\mathrm{d}x = \ln(\mathrm{ch}\, x) + C$$

$$\int \coth x\mathrm{d}x = \ln|\mathrm{sh}\, x| + C$$

$$\int \frac{\mathrm{d}x}{\mathrm{ch}^2 x} = \mathrm{th}\, x + C$$

$$\int \frac{\mathrm{d}x}{\mathrm{sh}^2 x} = -\coth x + C$$

$$\int \frac{\mathrm{d}x}{\mathrm{ch}\, x} = 2\arctan e^x + C$$

$$\int \frac{\mathrm{d}x}{\mathrm{sh}\, x} = \frac{1}{2}\ln\left(\frac{\mathrm{ch}\, x-1}{\mathrm{ch}\, x+1}\right) + C$$

NB : à l'aide du changement de variable $t = \tan\frac{x}{2}$, pour lequel on a

$$\mathrm{d}x = \frac{2\mathrm{d}t}{1+t^2}\ ;\ \sin x = \frac{2t}{1+t^2}\ ;\ \cos x = \frac{1-t^2}{1+t^2},$$

on obtient aussi

$$\int \frac{\mathrm{d}x}{\sin x} = \ln\left|\tan\frac{x}{2}\right| + C$$

d'où l'on déduit (si besoin...)

$$\int \frac{\mathrm{d}x}{\cos x} = \ln\left|\tan\left(\frac{x}{2}+\frac{\pi}{4}\right)\right| + C$$