Formulaire de primitives

$$\int \frac{dt}{t} = \ln|t| + k, \quad t \in \mathbb{R}^*,$$

Si $f \ : \ I \longrightarrow \mathbb{R}^*$ est dérivable, $\displaystyle\int \frac{f'(t)}{f(t)} \ dt = \ln|f(t)| + k.$

$$\int \ln(t) \ dt = t\ln t - t + k.$$

pour tout **complexe** $a \neq -1$, $\displaystyle\int t^a dt = \frac{t^{a+1}}{a+1} + k.$

Pour tout **complexe** $m \neq 0$, $\displaystyle\int e^{mt} \ dt = \frac{1}{m} e^{mt} + k.$

$$\int \cos t \ dt = \sin t + k, \qquad \int \sin t \ dt = -\cos t + k.$$

$$\int \mathrm{ch}t \ dt = \mathrm{sh}t + k, \qquad \int \mathrm{sh}t \ dt = \mathrm{ch}t + k.$$

$$\int \tan t \ dt = -\ln|\cos t| + k, t \in \mathbb{R} \setminus (\frac{\pi}{2} + \pi\mathbb{Z}).$$

$$\int \mathrm{cotan} \ t \ dt = \ln|\sin t| + k, t \in \mathbb{R} \setminus \pi\mathbb{Z}.$$

$$\int \mathrm{th}t \ dt = \ln(\mathrm{ch}t) + k \qquad \int \coth(t) \ dt = \ln|\mathrm{sh}t| + k, t \in \mathbb{R}^*.$$

$$\int \frac{dt}{\cos^2 t} = \tan \ t + k, t \in \mathbb{R} \setminus (\frac{\pi}{2} + \pi\mathbb{Z}) \qquad \int \frac{dt}{\sin^2 t} = -\mathrm{cotan} \ \ t + k, t \in \mathbb{R} \setminus \pi\mathbb{Z}.$$

$$\int \frac{dt}{\mathrm{ch}^2 t} = \mathrm{th} \ t + k \qquad \int \frac{dt}{\mathrm{sh}^2 t} = -\coth \ t + k, t \in \mathbb{R}^*.$$

$$\int (1+\tan^2 t)dt = \tan\ t + k, t \in \mathbb{R} \setminus (\frac{\pi}{2} + \pi\mathbb{Z}), \qquad \int (1-\text{th}^2 t)dt = \text{th}\ t + k.$$

$$\int \frac{dt}{\cos t} = \ln\left|\tan\left(\frac{t}{2}+\frac{\pi}{4}\right)\right| + k, t \in \mathbb{R} \setminus (\frac{\pi}{2} + \pi\mathbb{Z}).$$

$$\int \frac{dt}{\sin t} = \ln\left|\tan\left(\frac{t}{2}\right)\right| + k, t \in \mathbb{R} \setminus \pi\mathbb{Z}.$$

$$\int \frac{dt}{\text{ch}t} = 2\text{arctan}(e^t) + k \qquad \int \frac{dt}{\text{sh}t} = \ln\left|\text{th}\left(\frac{t}{2}\right)\right| + k, t \in \mathbb{R}^*.$$

Soit $a \in \mathbb{R}_+^*$:

$$\int \frac{dt}{t^2+a^2} = \frac{1}{a}\text{arctan}\left(\frac{t}{a}\right) + k \qquad \int \frac{dt}{t^2-a^2} = \begin{cases} \frac{1}{2a}\ln\left|\frac{t-a}{t+a}\right| + k, t \in \mathbb{R} \setminus \{a,-a\} \\ -\frac{1}{a}\text{argth}\left(\frac{t}{a}\right) + k, t \in]-a,a[\end{cases}.$$

$$\int \frac{dt}{\sqrt{a^2-t^2}} = \text{arcsin}\left(\frac{t}{a}\right) + k = -\text{arccos}\left(\frac{t}{a}\right) + k', t \in]-a,a[.$$

Soit $b \in \mathbb{R}^*$: $\displaystyle\int \frac{dt}{\sqrt{t^2+b}} = \ln(|t+\sqrt{t^2+b}|) + k.$