List of Derivatives and Integrals of Elementary Functions

$$\frac{\mathrm{d}x^n}{\mathrm{d}x} = nx^{n-1}.$$

$$\frac{\mathrm{d}\ln(x)}{\mathrm{d}x} = \frac{1}{x}.$$

$$\frac{\mathrm{d}a^x}{\mathrm{d}x} = \ln a a^x.$$

$$\frac{\mathrm{d}\sin(x)}{\mathrm{d}x} = \cos(x).$$

$$\frac{\mathrm{d}\cos(x)}{\mathrm{d}x} = -\sin(x).$$

$$\frac{\mathrm{d}\tan(x)}{\mathrm{d}x} = \sec^2(x).$$

$$\frac{\mathrm{d}\cot(x)}{\mathrm{d}x} = -\csc^2(x).$$

$$\frac{\mathrm{d}\sec(x)}{\mathrm{d}x} = \sec(x)\tan(x).$$

$$\frac{\mathrm{d}\csc(x)}{\mathrm{d}x} = -\csc(x)\cot(x).$$

$$\frac{\mathrm{d}\arcsin(x)}{\mathrm{d}x} = \frac{1}{\sqrt{1-x^2}}.$$

$$\frac{\mathrm{d}\arccos(x)}{\mathrm{d}x} = -\frac{1}{\sqrt{1-x^2}}.$$

$$\frac{\mathrm{d}\arctan(x)}{\mathrm{d}x} = \frac{1}{x^2+1}.$$

$$\frac{\mathrm{d}\,\mathrm{arccot}(x)}{\mathrm{d}x} = -\frac{1}{x^2+1}.$$

$$\frac{\mathrm{d}\,\mathrm{arcsec}(x)}{\mathrm{d}x} = \frac{1}{|x|\sqrt{x^2+1}}.$$

$$\frac{\mathrm{d}\,\mathrm{arccsc}(x)}{\mathrm{d}x} = -\frac{1}{|x|\sqrt{x^2+1}}.$$

$$\int x^n\,\mathrm{d}x = \begin{cases} \frac{1}{n+1}x^{n+1} + C, & n \neq -1 \\ \ln|x| + C, & n \neq -1 \end{cases}.$$

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

$$\int (\ln x)^n\,\mathrm{d}x = x(\ln x)^n - n\int (\ln x)^{n-1}\,\mathrm{d}x.$$

$$\int e^x\,\mathrm{d}x = e^x + C.$$

$$\int e^{nx}\,\mathrm{d}x = \frac{1}{n}e^{nx} + C, \quad n \neq 0.$$

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

$$\int \sin^2 x \, \mathrm{d}x = \frac{x}{2} - \frac{\sin(2x)}{4} + C.$$

$$\int \sin^n x \, \mathrm{d}x = -\frac{1}{n} \sin^{n-1} x \cos x + \frac{n-1}{n} \int \sin^{n-2} x \, \mathrm{d}x\,, \quad n \in \mathbb{N}_{>1}.$$

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

$$\int \cos^2 x \, \mathrm{d}x = \frac{x}{2} + \frac{\sin(2x)}{4} + C.$$

$$\int \cos^n x \, \mathrm{d}x = \frac{1}{n} \cos^{n-1} x \sin x + \frac{n-1}{n} \int \cos^{n-2} x \, \mathrm{d}x\,, \quad n \in \mathbb{N}_{>1}.$$

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

$$\int \tan^2 x \, \mathrm{d}x = \tan x - x + C.$$

$$\int \tan^n x \, \mathrm{d}x = \frac{1}{n-1} \tan^{n-1} x - \int \tan^{n-2} x \, \mathrm{d}x\,, \quad n \in \mathbb{N}_{>1}.$$

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

$$\int \cot^2 x \, \mathrm{d}x = -\cot x - x + C.$$

$$\int \cot^n x \, \mathrm{d}x = -\frac{1}{n-1} \cot^{n-1} x - \int \cot^{n-2} x \, \mathrm{d}x\,, \quad n \in \mathbb{N}_{>1}.$$

$$\int \sec x \, \mathrm{d}x = \ln|\sec x + \tan x| + C.$$

$$\int \sec^2 x \, \mathrm{d}x = \tan x + C.$$

$$\int \sec^n x \, \mathrm{d}x = \frac{1}{n-1} \sec^{n-2} x \tan x + \frac{n-2}{n-1} \int \sec^{n-2} x \, \mathrm{d}x\,, \quad n \in \mathbb{N}_{>1}.$$

$$\int \csc x \, \mathrm{d}x = -\ln|\csc x + \cot x| + C.$$

$$\int \csc^2 x \, \mathrm{d}x = -\cot x + C.$$

$$\int \csc^n x \, \mathrm{d}x = -\frac{1}{n-1} \csc^{n-2} x \cot x + \frac{n-2}{n-1} \int \csc^{n-2} x \, \mathrm{d}x\,, \quad n \in \mathbb{N}_{>1}.$$

$$\int \arcsin x \, \mathrm{d}x = x \arcsin x + \sqrt{1-x^2} + C.$$

$$\int \arccos x \, \mathrm{d}x = x \arccos x - \sqrt{1-x^2} + C.$$

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

$$\int \operatorname{arccot} x \, \mathrm{d}x = x \operatorname{arccot} x + \frac{1}{2} \ln\left(1+x^2\right) + C.$$

$$\int \operatorname{arcsec} x \, \mathrm{d}x = x \operatorname{arcsec} x - \ln\left|x + \sqrt{x^2-1}\right| + C, \quad |x| \geq 1.$$

$$\int \operatorname{arccsc} x \, \mathrm{d}x = x \operatorname{arccsc} x + \ln\left|x + \sqrt{x^2-1}\right| + C, \quad |x| \geq 1.$$