یادآوری فرمول‌هایی از انتگرال گیری

$$\int f'(x)\,dx = f(x) + C$$

$$\frac{d}{dx}\int f(x)\,dx = f(x), \quad \frac{d}{dx}\int_a^x f(t)\,dt = f(x)$$

$$\frac{d}{dx}\int_{g(x)}^{h(x)} f(t)\,dt = h'(x)f(h(x)) - g'(x)f(g(x))$$

فرمول جزء به جزء انتگرال‌گیری ⟸ u, v توابعی از متغیر مستقل x به صورت زیر است:

$$\int u\,dv = uv - \int v\,du$$

$$\int f(ax+b)\,dx = \frac{1}{a}F(ax+b)+c$$

که F پادمشتق f است

$$\text{if } \alpha \neq -1 \Rightarrow \int x^{\alpha}\,dx = \frac{x^{\alpha+1}}{\alpha+1} + C$$

$$\text{if } \alpha = -1 \Rightarrow \int x^{-1}\,dx = \int \frac{dx}{x} = \ln|x| + C$$

$$a \neq 1,\ a>0 \Rightarrow \int a^{kx}\,dx = \frac{a^{kx}}{k\ln a} + C$$

$$\int \sin x\,dx = -\cos x + C, \quad \int \cos x\,dx = \sin x + C$$

$$\int \tan x\,dx = -\ln|\cos x| + C, \quad \int \cot\text{ang}\, x\,dx = \ln|\sin x| + C$$

$$\int \sinh x\,dx = \cosh x + C, \quad \int \cosh x\,dx = \sinh x + C$$

$$\int \frac{dx}{\sin^2 x} = -\cot x + C, \quad \int \frac{dx}{\cos^2 x} = \tan x + C$$

$$\int \frac{dx}{\sinh^2 x} = -\coth x + C, \quad \int \frac{dx}{\cosh^2 x} = \tanh x + C$$

$$\int \frac{dx}{a^2+x^2} = \frac{1}{a}\arctan\left(\frac{x}{a}\right)+C \qquad a\neq 0$$
$$= \frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right)+C$$

$$\int \frac{dx}{a^2-x^2} = \frac{1}{a}\tanh^{-1}\left(\frac{x}{a}\right)+C \qquad a\neq 0$$

ب

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

$$\int \frac{dx}{\sqrt{a^2+x^2}} = \ln\left|x+\sqrt{a^2+x^2}\right|+C$$

$$\int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin\left(\frac{x}{a}\right)+C = \sin^{-1}\left(\frac{x}{a}\right)+C$$

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

$$\int \frac{dx}{\cos x} = \begin{cases} = \tanh^{-1}(\sin x)+C \\ = \ln\left|\tan\left(\frac{x}{2}+\frac{\pi}{2}\right)\right|+C \\ = \ln|\sec x+\tan x|+C \end{cases} \qquad \int \frac{dx}{\sin x} \begin{cases} = -\tanh^{-1}(\cos x)+C \\ = \ln\left|\tan\left(\frac{x}{2}\right)\right|+C \\ = \ln|\csc x-\cot g x|+C \end{cases}$$

$$\int \tanh x\,dx = \ln\cosh x+C \;,\quad \int \cot g\,h\,x\,dx = \ln|\sinh x|+C$$

$$\int \frac{dx}{\sinh x} = \ln\left|\tanh\frac{x}{2}\right|+C \;,\quad \int \frac{dx}{\cosh x} = 2\arctan(e^x)+C$$

$$\int e^{kx}dx = \frac{1}{k}e^{kx}+C \;,\quad \int f(g(x))\,g'(x)\,dx = f(g$$

$$\int (1+\tan^2 x)\,dx = \tan x+C \qquad \int \ln x\,dx = x\ln x - \ln x+C$$

$$\int (1+\cot g^2 x)\,dx = -\cot g x+C$$