Bảng công thức nguyên hàm cơ bản

Nguyên hàm của các hàm số sơ cấp thường gặp	Nguyên hàm của các hàm số hợp (dưới đây u = u(x))
$\int dx = x + C$	$\int du = u + C$
$\int x^{\alpha} dx = \frac{x^{\alpha+1}}{\alpha+1} + C \quad (\alpha \neq -1)$	$\int u^{\alpha} du = \frac{u^{\alpha+1}}{\alpha+1} + C \quad (\alpha \neq -1)$
$\int \frac{dx}{x} = \ln\lvert x\rvert + C \quad (x \neq 0)$	$\int \frac{du}{u} = \ln\lvert u\rvert + C \quad (u = u(x) \neq 0)$
$\int e^{x} dx = e^{x} + C$	$\int e^{u} du = e^{u} + C$
$\int a^{x} dx = \frac{a^{x}}{\ln a} + C \quad (0 < a \neq 1)$	$\int a^{u} du = \frac{a^{u}}{\ln a} + C \quad (0 < a \neq 1)$
$\int \cos x dx = \sin x + C$	$\int \cos u du = \sin u + C$
$\int \sin x dx = -\cos x + C$	$\int \sin u du = -\cos u + C$
$\int \frac{dx}{\cos^2 x} = \int (1 + tg^2 x) dx = tgx + C$	$\int \frac{du}{\cos^2 u} = \int (1 + tg^2 u) du = tgu + C$
$\int \frac{dx}{\sin^2 x} = \int (1 + \cot g^2 x) dx = -\cot gx + C$	$\int \frac{du}{\sin^2 u} = \int (1 + \cot g^2 u) du = -\cot gu + C$
$\int \frac{dx}{2\sqrt{x}} = \sqrt{x} + C \quad (x > 0)$	$\int \frac{du}{2\sqrt{u}} = \sqrt{u} + C \quad (u > 0)$
$\int \cos(ax + b) dx = \frac{1}{a} \sin(ax + b) + C \quad (a \neq 0)$	
$\int \sin(ax + b) dx = -\frac{1}{a} \cos(ax + b) + C \quad (a \neq 0)$	
$\int \frac{dx}{ax + b} = \frac{1}{a} \ln\lvert ax + b\rvert + C$	
$\int e^{ax+b} dx = \frac{1}{a} e^{ax+b} + C \quad (a \neq 0)$	
$\int \frac{dx}{\sqrt{ax + b}} = \frac{2}{a} \sqrt{ax + b} + C \quad (a \neq 0)$	

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$\int (ax+b)^{\alpha}\,dx = \frac{1}{a}\left(\frac{ax+b}{\alpha+1}\right)^{\alpha+1} + c, \alpha \neq -1$	$\int \cos(ax+b)\,dx = \frac{1}{a}\sin(ax+b) + c$
$\int \frac{dx}{ax+b} = \frac{1}{a}\ln\lvert ax+b\rvert + c$ + c	$\int \sin(ax+b)\,dx = \frac{-1}{a}\cos(ax+b) + c$
$\int e^{ax+b}\,dx = \frac{1}{a}e^{ax+b} + c$	$\int tg(ax+b)\,dx = -\frac{1}{a}\ln\lvert\cos(ax+b)\rvert + c$
$\int m^{ax+b}\,dx = \frac{1}{a\ln m}\,m^{ax+b} + c$	$\int cotg(ax+b)\,dx = \frac{1}{a}\ln\lvert\sin(ax+b)\rvert + c$
$\int \frac{dx}{a^2+x^2} = \frac{1}{a}arctg\frac{x}{a} + c$	$\int \frac{dx}{\sin^2(ax+b)} = \frac{-1}{a}cotg(ax+b) + c$
$\int \frac{dx}{a^2-x^2} = \frac{1}{2a}\ln\left\lvert\frac{a+x}{a-x}\right\rvert + c$	$\int \frac{dx}{\cos^2(ax+b)} = \frac{1}{a}tg(ax+b) + c$
$\int \frac{dx}{\sqrt{x^2+a^2}} = \ln\left(x+\sqrt{x^2+a^2}\right) + c$	$\int arcsin\frac{x}{a}\,dx = x\,arcsin\frac{x}{a} + \sqrt{a^2-x^2} + c$
$\int \frac{dx}{\sqrt{a^2-x^2}} = arcsin\frac{x}{\lvert a\rvert} + c$	$\int arccos\frac{x}{a}\,dx = x\,arccos\frac{x}{a} - \sqrt{a^2-x^2} + c$
$\int \frac{dx}{x\sqrt{x^2-a^2}} = \frac{1}{a}arccos\left\lvert\frac{x}{a}\right\rvert + c$	$\int arctg\frac{x}{a}\,dx = x\,arctg\frac{x}{a} - \frac{a}{2}\ln(a^2+x^2) + c$
$\int \frac{dx}{x\sqrt{x^2+a^2}} = -\frac{1}{a}\ln\left\lvert\frac{a+\sqrt{x^2+a^2}}{x}\right\rvert + c$	$\int arccotg\frac{x}{a}\,dx = x\,arccotg\frac{x}{a} + \frac{a}{2}\ln(a^2+x^2) + c$
$\int \ln(ax+b)\,dx = \left(x+\frac{b}{a}\right)\ln(ax+b) - x + c$	$\int \frac{dx}{\sin(ax+b)} = \frac{1}{a}\ln\left\lvert tg\frac{ax+b}{2}\right\rvert + c$
$\int \sqrt{a^2-x^2}\,dx = \frac{x\sqrt{a^2-x^2}}{2} + \frac{a^2}{2}arcsin\frac{x}{a} + c$	$\int \frac{dx}{\sin(ax+b)} = \frac{1}{a}\ln\left\lvert tg\frac{ax+b}{2}\right\rvert + c$
$\int e^{ax}\sin bx\,dx = \frac{e^{ax}(a\sin bx - b\cos bx)}{a^2+b^2} + c$	$\int e^{ax}\cos bx\,dx = \frac{e^{ax}(a\cos bx + b\sin bx)}{a^2+b^2} + c$

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$$\int \frac{\mathrm{dx}}{a^2+x^2} = \frac{1}{a}\operatorname{arctg}\frac{x}{a} + c$$

$$\int \frac{\mathrm{dx}}{a^2-x^2} = \frac{1}{2a}\ln\left|\frac{a+x}{a-x}\right| + c$$

$$\int \frac{\mathrm{dx}}{\sqrt{x^2+a^2}} = \ln\left(x+\sqrt{x^2+a^2}\right) + c$$

$$\int \frac{\mathrm{dx}}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{|a|} + c$$

$$\int \frac{\mathrm{dx}}{x\sqrt{x^2-a^2}} = \frac{1}{a}\arccos\left|\frac{x}{a}\right| + c$$

$$\int \frac{\mathrm{dx}}{x\sqrt{x^2+a^2}} = -\frac{1}{a}\ln\left|\frac{a+\sqrt{x^2+a^2}}{x}\right| + c$$

$$\int \ln(ax+b)\,\mathrm{dx} = \left(x+\frac{b}{a}\right)\ln(ax+b) - x + c$$

$$\int \sqrt{a^2-x^2}\,\mathrm{dx} = \frac{x\sqrt{a^2-x^2}}{2} + \frac{a^2}{2}\arcsin\frac{x}{a} + c$$

$$\int \frac{\mathrm{dx}}{\sin(ax+b)} = \frac{1}{a}\ln\left|\tan\frac{ax+b}{2}\right| + c$$

$$\int e^{ax}\cos bx\,\mathrm{dx} = \frac{e^{ax}(a\cos bx + b\sin bx)}{a^2+b^2} + c$$

$$\int e^{ax}\sin bx\,\mathrm{dx} = \frac{e^{ax}(a\sin bx - b\cos bx)}{a^2+b^2} + c$$

Bảng nguyên hàm hàm số lượng giác

Nguyên hàm của hàm số sơ cấp	*Nguyên hàm của hàm số hợp* $(u=u(x))$	*Nguyên hàm của hàm số hợp* $(u=ax+b;\quad a\neq 0)$
$\int \sin x dx = -\cos x + C$	$\int \sin u du = -\cos u + C$	$\int \sin(ax+b)dx = -\frac{1}{a}\cos(ax+b)+C$
$\int \cos x dx = \sin x + C$	$\int \cos u du = \sin u + C$	$\int \cos(ax+b)dx = \frac{1}{a}\cdot\sin(ax+b)+C$
$\int \tan x.dx = -\ln\lvert\cos x\rvert + C$	$\int \tan u.du = -\ln\lvert\cos u\rvert + C$	$\int \tan(ax+b)dx = -\frac{1}{a}\ln\lvert\cos(ax+b)\rvert + C$
$\int \cot x.dx = \ln\lvert\sin x\rvert + C$	$\int \cot u.du = \ln\lvert\sin u\rvert + C$	$\int \cot(ax+b)dx = \frac{1}{a}\ln\lvert\sin(ax+b)\rvert + C$
$\int \frac{1}{\sin^2 x}dx = -\cot x + C$	$\int \frac{1}{\sin^2 u}du = -\cot u + C$	$\int \frac{1}{\sin^2(ax+b)}dx = -\frac{1}{a}\cot(ax+b)+C$
$\int \frac{1}{\cos^2 x}dx = \tan x + C$	$\int \frac{1}{\cos^2 u}du = \tan u + C$	$\int \frac{1}{\cos^2(ax+b)}dx = \frac{1}{a}\tan(ax+b)+C$
$\int \frac{1}{\sin x}dx = \ln\left\lvert\tan\frac{x}{2}\right\rvert + C$	$\int \frac{1}{\sin u}du = \ln\left\lvert\tan\frac{u}{2}\right\rvert + C$	$\int \frac{dx}{\sin(ax+b)} = \frac{1}{a}\ln\left\lvert tg\frac{ax+b}{2}\right\rvert + C$
$\int \frac{1}{\cos x}dx = \ln\left\lvert\tan\left(\frac{x}{2}+\frac{\pi}{4}\right)\right\rvert + C$	$\int \frac{1}{\cos u}du = \ln\left\lvert\tan\left(\frac{u}{2}+\frac{\pi}{4}\right)\right\rvert + C$	$\int \frac{dx}{\cos(ax+b)} = \frac{1}{a}\ln\left\lvert\tan\frac{ax+b}{2}+\frac{\pi}{4}\right\rvert + C$