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List of integrals of trigonometric functions

The following is a list of integrals (antiderivative functions) of trigonometric functions. For antiderivatives involving both exponential and trigonometric functions, see List of integrals of exponential functions. For a complete list of antiderivative functions, see Lists of integrals. For the special antiderivatives involving trigonometric functions, see Trigonometric integral.

Generally, if the function $\sin x$ is any trigonometric function, and $\cos x$ is its derivative,

$$\int a\cos nx\,dx = \frac{a}{n}\sin nx + C$$

In all formulas the constant a is assumed to be nonzero, and C denotes the constant of integration.

Contents

Integrands involving only sine

$$\int \sin ax\,dx = -\frac{1}{a}\cos ax + C$$

$$\int \sin^2 ax\,dx = \frac{x}{2} - \frac{1}{4a}\sin 2ax + C = \frac{x}{2} - \frac{1}{2a}\sin ax\cos ax + C$$

$$\int \sin^3 ax\,dx = \frac{\cos 3ax}{12a} - \frac{3\cos ax}{4a} + C$$

$$\int x\sin^2 ax\,dx = \frac{x^2}{4} - \frac{x}{4a}\sin 2ax - \frac{1}{8a^2}\cos 2ax + C$$

$$\int x^2\sin^2 ax\,dx = \frac{x^3}{6} - \left(\frac{x^2}{4a} - \frac{1}{8a^3}\right)\sin 2ax - \frac{x}{4a^2}\cos 2ax + C$$

$$\int x\sin ax\,dx = \frac{\sin ax}{a^2} - \frac{x\cos ax}{a} + C$$

$$\int (\sin b_1x)(\sin b_2x)\,dx = \frac{\sin((b_2-b_1)x)}{2(b_2-b_1)} - \frac{\sin((b_1+b_2)x)}{2(b_1+b_2)} + C \qquad (\text{for } |b_1| \neq |b_2|)$$

$$\int \sin^n ax\,dx = -\frac{\sin^{n-1} ax\cos ax}{na} + \frac{n-1}{n}\int \sin^{n-2} ax\,dx \qquad (\text{for } n>0)$$

$$\int \frac{dx}{\sin ax} = -\frac{1}{a}\ln|\csc ax + \cot ax| + C$$

$$\int \frac{dx}{\sin^n ax} = \frac{\cos ax}{a(1-n)\sin^{n-1} ax} + \frac{n-2}{n-1}\int \frac{dx}{\sin^{n-2} ax} \qquad (\text{for } n>1)$$

$$\int x^n \sin ax\,dx = -\frac{x^n}{a}\cos ax + \frac{n}{a}\int x^{n-1}\cos ax\,dx$$
$$= \sum_{k=0}^{2k\le n}(-1)^{k+1}\frac{x^{n-2k}}{a^{1+2k}}\frac{n!}{(n-2k)!}\cos ax + \sum_{k=0}^{2k+1\le n}(-1)^k\frac{x^{n-1-2k}}{a^{2+2k}}\frac{n!}{(n-2k-1)!}\sin ax$$
$$= -\sum_{k=0}^{n}\frac{x^{n-k}}{a^{1+k}}\frac{n!}{(n-k)!}\cos\left(ax + k\frac{\pi}{2}\right) \qquad (\text{for } n>0)$$

$$\int \frac{\sin ax}{x}\,dx = \sum_{n=0}^{\infty}(-1)^n\frac{(ax)^{2n+1}}{(2n+1)\cdot(2n+1)!} + C$$

$$\int \frac{\sin ax}{x^n}\,dx = -\frac{\sin ax}{(n-1)x^{n-1}} + \frac{a}{n-1}\int\frac{\cos ax}{x^{n-1}}\,dx$$

$$\int \sin(ax^2+bx+c)dx = \begin{cases}\sqrt{a}\sqrt{\frac{\pi}{2}}\cos\left(\frac{b^2-4ac}{4a}\right)S\left(\frac{2ax+b}{\sqrt{2a\pi}}\right)+\sqrt{a}\sqrt{\frac{\pi}{2}}\sin\left(\frac{b^2-4ac}{4a}\right)C\left(\frac{2ax+b}{\sqrt{2a\pi}}\right) & to\ b^2-4ac>0\\ \sqrt{a}\sqrt{\frac{\pi}{2}}\cos\left(\frac{b^2-4ac}{4a}\right)S\left(\frac{2ax+b}{\sqrt{2a\pi}}\right)-\sqrt{a}\sqrt{\frac{\pi}{2}}\sin\left(\frac{b^2-4ac}{4a}\right)C\left(\frac{2ax+b}{\sqrt{2a\pi}}\right) & to\ b^2-4ac<0\end{cases} \quad for\ a\neq0,\ a>0$$

$$\int \frac{dx}{1\pm\sin ax} = \frac{1}{a}\tan\left(\frac{ax}{2}\mp\frac{\pi}{4}\right) + C$$

$$\int \frac{x\,dx}{1+\sin ax} = \frac{x}{a}\tan\left(\frac{ax}{2}-\frac{\pi}{4}\right) + \frac{2}{a^2}\ln\left|\cos\left(\frac{ax}{2}-\frac{\pi}{4}\right)\right| + C$$

$$\int \frac{x\,dx}{1-\sin ax} = \frac{x}{a}\cot\left(\frac{\pi}{4}-\frac{ax}{2}\right) + \frac{2}{a^2}\ln\left|\sin\left(\frac{\pi}{4}-\frac{ax}{2}\right)\right| + C$$

$$\int \frac{\sin ax\,dx}{1\pm\sin ax} = \pm x + \frac{1}{a}\tan\left(\frac{\pi}{4}\mp\frac{ax}{2}\right) + C$$

Integrands involving only cosine

$$\int \cos ax\,dx = \frac{1}{a}\sin ax + C$$

$$\int \cos^2 ax\,dx = \frac{x}{2} + \frac{1}{4a}\sin 2ax + C = \frac{x}{2} + \frac{1}{2a}\sin ax\cos ax + C$$

$$\int \cos^n ax\,dx = \frac{\cos^{n-1}ax\sin ax}{na} + \frac{n-1}{n}\int\cos^{n-2}ax\,dx \qquad (\text{for } n>0)$$

$$\int x\cos ax\,dx = \frac{\cos ax}{a^2} + \frac{x\sin ax}{a} + C$$

$$\int x^2\cos^2 ax\,dx = \frac{x^3}{6} + \left(\frac{x^2}{4a}-\frac{1}{8a^3}\right)\sin 2ax + \frac{x}{4a^2}\cos 2ax + C$$

$$\int x^n\cos ax\,dx = \frac{x^n\sin ax}{a} - \frac{n}{a}\int x^{n-1}\sin ax\,dx$$
$$= \sum_{k=0}^{2k+1\le n}(-1)^k\frac{x^{n-2k-1}}{a^{2+2k}}\frac{n!}{(n-2k-1)!}\cos ax + \sum_{k=0}^{2k\le n}(-1)^k\frac{x^{n-2k}}{a^{1+2k}}\frac{n!}{(n-2k)!}\sin ax$$
$$= \sum_{k=0}^{n}(-1)^{\lfloor k/2\rfloor}\frac{x^{n-k}}{a^{1+k}}\frac{n!}{(n-k)!}\cos\left(ax - \frac{(-1)^k+1}{2}\frac{\pi}{2}\right)$$
$$= \sum_{k=0}^{n}\frac{x^{n-k}}{a^{1+k}}\frac{n!}{(n-k)!}\sin\left(ax + k\frac{\pi}{2}\right) \qquad (\text{for } n>0)$$

$$\int\frac{\cos ax}{x}\,dx = \ln|ax| + \sum_{k=1}^{\infty}(-1)^k\frac{(ax)^{2k}}{2k\cdot(2k)!} + C$$

$$\int\frac{\cos ax}{x^n}\,dx = -\frac{\cos ax}{(n-1)x^{n-1}} - \frac{a}{n-1}\int\frac{\sin ax}{x^{n-1}}\,dx \qquad (\text{for } n\neq 1)$$

$$\int\frac{dx}{\cos ax} = \frac{1}{a}\ln\left|\tan\left(\frac{ax}{2}+\frac{\pi}{4}\right)\right| + C$$

$$\int\frac{dx}{\cos^n ax} = \frac{\sin ax}{a(n-1)\cos^{n-1}ax} + \frac{n-2}{n-1}\int\frac{dx}{\cos^{n-2}ax} \qquad (\text{for } n>1)$$

$$\int\frac{dx}{1+\cos ax} = \frac{1}{a}\tan\frac{ax}{2} + C$$

$$\int\frac{dx}{1-\cos ax} = -\frac{1}{a}\cot\frac{ax}{2} + C$$

$$\int \frac{x\,dx}{1+\cos ax} = \frac{x}{a}\tan\frac{ax}{2} + \frac{2}{a^2}\ln\left|\cos\frac{ax}{2}\right| + C$$

$$\int \frac{x\,dx}{1-\cos ax} = -\frac{x}{a}\cot\frac{ax}{2} + \frac{2}{a^2}\ln\left|\sin\frac{ax}{2}\right| + C$$

$$\int \frac{\cos ax\,dx}{1+\cos ax} = x - \frac{1}{a}\tan\frac{ax}{2} + C$$

$$\int \frac{\cos ax\,dx}{1-\cos ax} = -x - \frac{1}{a}\cot\frac{ax}{2} + C$$

$$\int (\cos a_1 x)(\cos a_2 x)\,dx = \frac{\sin((a_2-a_1)x)}{2(a_2-a_1)} + \frac{\sin((a_2+a_1)x)}{2(a_2+a_1)} + C \qquad (\text{for } |a_1| \neq |a_2|)$$

Integrands involving only tangent

$$\int \tan ax\,dx = -\frac{1}{a}\ln|\cos ax| + C = \frac{1}{a}\ln|\sec ax| + C$$

$$\int \tan^2 x\,dx = \tan x - x + C$$

$$\int \tan^n ax\,dx = \frac{1}{a(n-1)}\tan^{n-1} ax - \int \tan^{n-2} ax\,dx \qquad (\text{for } n \neq 1)$$

$$\int \frac{dx}{q\tan ax + p} = \frac{1}{p^2+q^2}\left(px + \frac{q}{a}\ln|q\sin ax + p\cos ax|\right) + C \qquad (\text{for } p^2+q^2 \neq 0)$$

$$\int \frac{dx}{\tan ax \pm 1} = \pm\frac{x}{2} + \frac{1}{2a}\ln|\sin ax \pm \cos ax| + C$$

$$\int \frac{\tan ax\,dx}{\tan ax \pm 1} = \frac{x}{2} \mp \frac{1}{2a}\ln|\sin ax \pm \cos ax| + C$$

Integrands involving only secant

See Integral of the secant function.

$$\int \sec ax\,dx = \frac{1}{a}\ln|\sec ax + \tan ax| + C = \frac{1}{a}\ln\left|\tan\left(\frac{ax}{2}+\frac{\pi}{4}\right)\right| + C = \frac{1}{a}\operatorname{artanh}(\sin ax) + C$$

$$\int \sec^2 x\,dx = \tan x + C$$

$$\int \sec^3 x\,dx = \frac{1}{2}\sec x\tan x + \frac{1}{2}\ln|\sec x + \tan x| + C.$$

$$\int \sec^n ax\,dx = \frac{\sec^{n-2} ax\tan ax}{a(n-1)} + \frac{n-2}{n-1}\int \sec^{n-2} ax\,dx \qquad (\text{for } n \neq 1)$$

$$\int \frac{dx}{\sec x + 1} = x - \tan\frac{x}{2} + C$$

$$\int \frac{dx}{\sec x - 1} = -x - \cot\frac{x}{2} + C$$

Integrands involving only cosecant

$$\int \csc ax\,dx = -\frac{1}{a}\ln|\csc ax + \cot ax| + C = \frac{1}{a}\ln|\csc ax - \cot ax| + C = \frac{1}{a}\ln\left|\tan\left(\frac{ax}{2}\right)\right| + C$$

$$\int \csc^2 x\,dx = -\cot x + C$$

$$\int \csc^3 x\,dx = -\frac{1}{2}\csc x\cot x - \frac{1}{2}\ln|\csc x + \cot x| + C = -\frac{1}{2}\csc x\cot x + \frac{1}{2}\ln|\csc x - \cot x| + C$$

$$\int \csc^n ax\,dx = -\frac{\csc^{n-2} ax\cot ax}{a(n-1)} + \frac{n-2}{n-1}\int \csc^{n-2} ax\,dx \qquad (\text{for } n \neq 1)$$

$$\int \frac{dx}{\csc x + 1} = x - \frac{2}{\cot\frac{x}{2} + 1} + C$$

$$\int \frac{dx}{\csc x - 1} = -x + \frac{2}{\cot \frac{x}{2} - 1} + C$$

Integrands involving only cotangent

$$\int \cot ax\,dx = \frac{1}{a} \ln|\sin ax| + C$$

$$\int \cot^2 x\,dx = -\cot x - x + C$$

$$\int \cot^n ax\,dx = -\frac{1}{a(n-1)} \cot^{n-1} ax - \int \cot^{n-2} ax\,dx \qquad (\text{for } n \neq 1)$$

$$\int \frac{dx}{1 + \cot ax} = \int \frac{\tan ax\,dx}{\tan ax + 1} = \frac{x}{2} - \frac{1}{2a} \ln|\sin ax + \cos ax| + C$$

$$\int \frac{dx}{1 - \cot ax} = \int \frac{\tan ax\,dx}{\tan ax - 1} = \frac{x}{2} + \frac{1}{2a} \ln|\sin ax - \cos ax| + C$$

Integrands involving both sine and cosine

An integral that is a rational function of the sine and cosine can be evaluated using Bioche's rules.

$$\int \frac{dx}{\cos ax \pm \sin ax} = \frac{1}{a\sqrt{2}} \ln\left|\tan\left(\frac{ax}{2} \pm \frac{\pi}{8}\right)\right| + C$$

$$\int \frac{dx}{(\cos ax \pm \sin ax)^2} = \frac{1}{2a} \tan\left(ax \mp \frac{\pi}{4}\right) + C$$

$$\int \frac{dx}{(\cos x + \sin x)^n} = \frac{1}{2(n-1)} \left(\frac{\sin x - \cos x}{(\cos x + \sin x)^{n-1}} + (n-2) \int \frac{dx}{(\cos x + \sin x)^{n-2}} \right)$$

$$\int \frac{\cos ax\,dx}{\cos ax + \sin ax} = \frac{x}{2} + \frac{1}{2a} \ln|\sin ax + \cos ax| + C$$

$$\int \frac{\cos ax\,dx}{\cos ax - \sin ax} = \frac{x}{2} - \frac{1}{2a} \ln|\sin ax - \cos ax| + C$$

$$\int \frac{\sin ax\,dx}{\cos ax + \sin ax} = \frac{x}{2} - \frac{1}{2a} \ln|\sin ax + \cos ax| + C$$

$$\int \frac{\sin ax\,dx}{\cos ax - \sin ax} = -\frac{x}{2} - \frac{1}{2a} \ln|\sin ax - \cos ax| + C$$

$$\int \frac{\cos ax\,dx}{(\sin ax)(1 + \cos ax)} = -\frac{1}{4a} \tan^2 \frac{ax}{2} + \frac{1}{2a} \ln\left|\tan \frac{ax}{2}\right| + C$$

$$\int \frac{\cos ax\,dx}{(\sin ax)(1 - \cos ax)} = -\frac{1}{4a} \cot^2 \frac{ax}{2} - \frac{1}{2a} \ln\left|\tan \frac{ax}{2}\right| + C$$

$$\int \frac{\sin ax\,dx}{(\cos ax)(1 + \sin ax)} = \frac{1}{4a} \cot^2\left(\frac{ax}{2} + \frac{\pi}{4}\right) + \frac{1}{2a} \ln\left|\tan\left(\frac{ax}{2} + \frac{\pi}{4}\right)\right| + C$$

$$\int \frac{\sin ax\,dx}{(\cos ax)(1 - \sin ax)} = \frac{1}{4a} \tan^2\left(\frac{ax}{2} + \frac{\pi}{4}\right) - \frac{1}{2a} \ln\left|\tan\left(\frac{ax}{2} + \frac{\pi}{4}\right)\right| + C$$

$$\int (\sin ax)(\cos ax)\,dx = \frac{1}{2a} \sin^2 ax + C$$

$$\int (\sin a_1 x)(\cos a_2 x)\,dx = -\frac{\cos((a_1 - a_2)x)}{2(a_1 - a_2)} - \frac{\cos((a_1 + a_2)x)}{2(a_1 + a_2)} + C \qquad (\text{for } |a_1| \neq |a_2|)$$

$$\int (\sin^n ax)(\cos ax)\,dx = \frac{1}{a(n+1)} \sin^{n+1} ax + C \qquad (\text{for } n \neq -1)$$

$$\int (\sin ax)(\cos^n ax)\,dx = -\frac{1}{a(n+1)} \cos^{n+1} ax + C \qquad (\text{for } n \neq -1)$$

$$\int (\sin^n ax)(\cos^m ax)\,dx = -\frac{(\sin^{n-1} ax)(\cos^{m+1} ax)}{a(n+m)} + \frac{n-1}{n+m}\int (\sin^{n-2} ax)(\cos^m ax)\,dx \qquad (\text{for } m,n>0)$$
$$= \frac{(\sin^{n+1} ax)(\cos^{m-1} ax)}{a(n+m)} + \frac{m-1}{n+m}\int (\sin^n ax)(\cos^{m-2} ax)\,dx \qquad (\text{for } m,n>0)$$

$$\int \frac{dx}{(\sin ax)(\cos ax)} = \frac{1}{a}\ln|\tan ax| + C$$

$$\int \frac{dx}{(\sin ax)(\cos^n ax)} = \frac{1}{a(n-1)\cos^{n-1} ax} + \int \frac{dx}{(\sin ax)(\cos^{n-2} ax)} \qquad (\text{for } n \neq 1)$$

$$\int \frac{dx}{(\sin^n ax)(\cos ax)} = -\frac{1}{a(n-1)\sin^{n-1} ax} + \int \frac{dx}{(\sin^{n-2} ax)(\cos ax)} \qquad (\text{for } n \neq 1)$$

$$\int \frac{\sin ax\,dx}{\cos^n ax} = \frac{1}{a(n-1)\cos^{n-1} ax} + C \qquad (\text{for } n \neq 1)$$

$$\int \frac{\sin^2 ax\,dx}{\cos ax} = -\frac{1}{a}\sin ax + \frac{1}{a}\ln\left|\tan\left(\frac{\pi}{4}+\frac{ax}{2}\right)\right| + C$$

$$\int \frac{\sin^2 ax\,dx}{\cos^n ax} = \frac{\sin ax}{a(n-1)\cos^{n-1} ax} - \frac{1}{n-1}\int \frac{dx}{\cos^{n-2} ax} \qquad (\text{for } n \neq 1)$$

$$\int \frac{\sin^2 x}{1+\cos^2 x}\,dx = \sqrt{2}\,\text{arctangant}\left(\frac{\tan x}{\sqrt{2}}\right) - x \qquad (\text{for x in}] -\frac{\pi}{2}; +\frac{\pi}{2}[)$$
$$= \sqrt{2}\,\text{arctangant}\left(\frac{\tan x}{\sqrt{2}}\right) - \text{arctangant}(\tan x) \qquad (\text{this time x being any real number })$$

$$\int \frac{\sin^n ax\,dx}{\cos ax} = -\frac{\sin^{n-1} ax}{a(n-1)} + \int \frac{\sin^{n-2} ax\,dx}{\cos ax} \qquad (\text{for } n \neq 1)$$

$$\int \frac{\sin^n ax\,dx}{\cos^m ax} = \begin{cases} \frac{\sin^{n+1} ax}{a(m-1)\cos^{m-1} ax} - \frac{n-m+2}{m-1}\int \frac{\sin^n ax\,dx}{\cos^{m-2} ax} & (\text{for } m \neq 1) \\ \frac{\sin^{n-1} ax}{a(m-1)\cos^{m-1} ax} - \frac{n-1}{m-1}\int \frac{\sin^{n-2} ax\,dx}{\cos^{m-2} ax} & (\text{for } m \neq 1) \\ -\frac{\sin^{n-1} ax}{a(n-m)\cos^{m-1} ax} + \frac{n-1}{n-m}\int \frac{\sin^{n-2} ax\,dx}{\cos^m ax} & (\text{for } m \neq n) \end{cases}$$

$$\int \frac{\cos ax\,dx}{\sin^n ax} = -\frac{1}{a(n-1)\sin^{n-1} ax} + C \qquad (\text{for } n \neq 1)$$

$$\int \frac{\cos^2 ax\,dx}{\sin ax} = \frac{1}{a}\left(\cos ax + \ln\left|\tan\frac{ax}{2}\right|\right) + C$$

$$\int \frac{\cos^2 ax\,dx}{\sin^n ax} = -\frac{1}{n-1}\left(\frac{\cos ax}{a\sin^{n-1} ax} + \int \frac{dx}{\sin^{n-2} ax}\right) \qquad (\text{for } n \neq 1)$$

$$\int \frac{\cos^n ax\,dx}{\sin^m ax} = \begin{cases} -\frac{\cos^{n+1} ax}{a(m-1)\sin^{m-1} ax} - \frac{n-m+2}{m-1}\int \frac{\cos^n ax\,dx}{\sin^{m-2} ax} & (\text{for } m \neq 1) \\ -\frac{\cos^{n-1} ax}{a(m-1)\sin^{m-1} ax} - \frac{n-1}{m-1}\int \frac{\cos^{n-2} ax\,dx}{\sin^{m-2} ax} & (\text{for } m \neq 1) \\ \frac{\cos^{n-1} ax}{a(n-m)\sin^{m-1} ax} + \frac{n-1}{n-m}\int \frac{\cos^{n-2} ax\,dx}{\sin^m ax} & (\text{for } m \neq n) \end{cases}$$

Integrands involving both sine and tangent

$$\int (\sin ax)(\tan ax)\,dx = \frac{1}{a}(\ln|\sec ax + \tan ax| - \sin ax) + C$$

$$\int \frac{\tan^n ax\,dx}{\sin^2 ax} = \frac{1}{a(n-1)}\tan^{n-1}(ax) + C \qquad (\text{for } n \neq 1)$$

Integrand involving both cosine and tangent

$$\int \frac{\tan^n ax\,dx}{\cos^2 ax} = \frac{1}{a(n+1)}\tan^{n+1} ax + C \qquad (\text{for } n \neq -1)$$

Integrand involving both sine and cotangent

$$\int \frac{\cot^n ax\,dx}{\sin^2 ax} = -\frac{1}{a(n+1)}\cot^{n+1} ax + C \qquad (\text{for } n \neq -1)$$

Integrand involving both cosine and cotangent

$$\int \frac{\cot^n ax\,dx}{\cos^2 ax} = \frac{1}{a(1-n)}\tan^{1-n} ax + C \qquad (\text{for } n \neq 1)$$

Integrand involving both secant and tangent

$$\int (\sec x)(\tan x)\,dx = \sec x + C$$

Integrand involving both cosecant and cotangent

$$\int (\csc x)(\cot x)\,dx = -\csc x + C$$

Integrals in a quarter period

$$\int_0^{\frac{\pi}{2}} \sin^n x\,dx = \int_0^{\frac{\pi}{2}} \cos^n x\,dx = \begin{cases} \frac{n-1}{n}\cdot\frac{n-3}{n-2}\cdots\frac{3}{4}\cdot\frac{1}{2}\cdot\frac{\pi}{2}, & \text{if } n \text{ is even} \\ \frac{n-1}{n}\cdot\frac{n-3}{n-2}\cdots\frac{4}{5}\cdot\frac{2}{3}, & \text{if } n \text{ is odd and more than 1} \\ 1, & \text{if } n = 1 \end{cases}$$

Integrals with symmetric limits

$$\int_{-c}^{c} \sin x\,dx = 0$$

$$\int_{-c}^{c} \cos x\,dx = 2\int_0^c \cos x\,dx = 2\int_{-c}^0 \cos x\,dx = 2\sin c$$

$$\int_{-c}^{c} \tan x\,dx = 0$$

$$\int_{-\frac{a}{2}}^{\frac{a}{2}} x^2\cos^2\frac{n\pi x}{a}\,dx = \frac{a^3(n^2\pi^2-6)}{24n^2\pi^2} \qquad (\text{for } n = 1, 3, 5...)$$

$$\int_{\frac{-a}{2}}^{\frac{a}{2}} x^2\sin^2\frac{n\pi x}{a}\,dx = \frac{a^3(n^2\pi^2-6(-1)^n)}{24n^2\pi^2} = \frac{a^3}{24}(1-6\frac{(-1)^n}{n^2\pi^2}) \qquad (\text{for } n = 1, 2, 3, \ldots)$$

Integral over a full circle

$$\int_0^{2\pi} \sin^{2m+1} x\cos^n x\,dx = 0 \qquad n, m \in \mathbb{Z}$$

$$\int_0^{2\pi} \sin^m x\cos^{2n+1} x\,dx = 0 \qquad n, m \in \mathbb{Z}$$

See also

- Trigonometric integral