

## MATHEMTAICAL TABLES

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| $\int \sin(ax) dx = -\left(\frac{1}{a}\right) \cos(ax) + c$   |
| $\int \sin^2(ax) dx = \left(\frac{1}{2}\right)x - \left(\frac{1}{4a}\right) \sin(2ax) + c$  |
| $\int \sin^3(ax) dx = -\left(\frac{1}{a}\right) \cos(ax) + \left(\frac{1}{3a}\right) \cos^3(ax) + c$  |
| $\int \sin^4(ax) dx = \left(\frac{3}{8}\right)x - \left(\frac{1}{4a}\right) \sin(2ax) + \left(\frac{1}{32a}\right) \sin(4ax) + c$   |
| $\int \sin^n(ax) dx = \frac{-(\sin^{(n-1)}(ax) \cos(ax))}{na} + \frac{(n-1)}{n} \int \sin^{(n-2)}(ax) dx, n = \text{integer} > 0$   |
| $\int x \sin ax dx = \frac{(\sin ax)}{a^2} - \frac{(x \cos ax)}{a} + c$   |
| $\int x^2 \sin(ax) dx = \frac{2x}{(a^2)} \sin(ax) - \left[\frac{x^2}{a} - \frac{2}{a^3}\right] \cos(ax) + c$  |
| $\int x^3 \sin(ax) dx = \left[\frac{3x^2}{a^2} - \frac{6}{a^4}\right] \sin(ax) - \left[\frac{x^3}{a} - \frac{6x}{a^3}\right] \cos(ax) + c$  |
| $\int x^n \sin(ax) dx = \frac{-x^n}{a} \cos(ax) + \frac{n}{a} \int x^{(n-1)} \cos(ax) dx, (n > 0)$  |
| $\int \frac{(\sin(ax))}{a} dx = ax - \frac{(ax)^3}{3.3!} + \frac{(ax)^5}{5.5!} - \frac{(ax)^7}{7.7!} + \dots + c$   |
| $\int \frac{(\sin(ax))}{x^2} dx = \frac{-(\sin(ax))}{x} + a \int \frac{(\cos(ax))}{x} dx$   |
| $\int \frac{(\sin(ax))}{x^n} dx = \frac{-1}{(n-1)} * \left[\frac{(\sin(ax))}{x^{(n-1)}}\right] + \left(\frac{a}{(n-1)}\right) * \int \frac{(\cos(ax))}{x^{(n-1)}} dx$             |
| $\int \frac{dx}{(\sin ax)} = \frac{1}{a} \ln\left(\tan\left(\frac{ax}{2}\right)\right) + c$   |
| $\int \frac{dx}{(\sin^2(ax))} = \frac{-1}{a} \cot(ax) + c$  |
| $\int \frac{dx}{(\sin^3(ax))} = \frac{-(\cos(ax))}{(2a \sin^2(ax))} + \frac{1}{(2a)} \ln\left(\tan\left(\frac{ax}{2}\right)\right) + c$   |
| $\int \frac{dx}{(\sin^n(ax))} = \frac{-1}{(a(n-1))} \frac{(\cos(ax))}{(\sin^{(n-1)}(ax))} + \frac{(n-2)}{(n-1)} \int \frac{dx}{(\sin^{(n-2)}(ax))}, n > 1$                        |
| $\int \frac{xdx}{(\sin ax)} = \frac{1}{(a^2)} \left(ax + \frac{(ax)^3}{3.3!} + 7 \frac{(ax)^5}{3.5.5!} + 31 \frac{(ax)^7}{3.7.7!} + 127 \frac{(ax)^9}{3.5.9!} + \dots\right) + c$ |
| $\int \frac{xdx}{(\sin^2 ax)} = \frac{-x}{a} \cot ax + \frac{1}{a^2} \ln(\sin ax) + c$  |