

Table of Basic Integrals¹

$$(1) \quad \int x^n dx = \frac{1}{n+1}x^{n+1}, \quad n \neq -1$$

$$(2) \quad \int \frac{1}{x} dx = \ln|x|$$

$$(3) \quad \int u dv = uv - \int vdu$$

$$(4) \quad \int e^x dx = e^x$$

$$(5) \quad \int a^x dx = \frac{1}{\ln a}a^x$$

$$(6) \quad \int \ln x dx = x \ln x - x$$

$$(7) \quad \int \sin x dx = -\cos x$$

$$(8) \quad \int \cos x dx = \sin x$$

$$(9) \quad \int \tan x dx = \ln|\sec x|$$

$$(10) \quad \int \sec x dx = \ln|\sec x + \tan x|$$

$$(11) \quad \int \sec^2 x dx = \tan x$$

$$(12) \quad \int \sec x \tan x dx = \sec x$$

$$(13) \quad \int \frac{a}{a^2 + x^2} dx = \tan^{-1} \frac{x}{a}$$

$$(14) \quad \int \frac{a}{a^2 - x^2} dx = \frac{1}{2} \ln \left| \frac{x+a}{x-a} \right|$$

$$(15) \quad \int \frac{1}{\sqrt{a^2 - x^2}} dx = \sin^{-1} \frac{x}{a}$$

$$(16) \quad \int \frac{a}{x\sqrt{x^2 - a^2}} dx = \sec^{-1} \frac{x}{a}$$

$$(17) \quad \int \frac{1}{\sqrt{x^2 - a^2}} dx = \cosh^{-1} \frac{x}{a} \\ = \ln(x + \sqrt{x^2 - a^2})$$

$$(18) \quad \int \frac{1}{\sqrt{x^2 + a^2}} dx = \sinh^{-1} \frac{x}{a} \\ = \ln(x + \sqrt{x^2 + a^2})$$

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