

Table of Standard Integrals

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| 1. $\int x^n dx = \frac{x^{n+1}}{n+1} + C \quad (n \neq -1)$ | 9. $\int \sec^2 x dx = \tan x + C$ |
| 2. $\int \frac{dx}{x} = \ln x + C$ | 10. $\int \operatorname{cosec}^2 x dx = -\cot x + C$ |
| 3. $\int e^x dx = e^x + C$ | 11. $\int \sec x dx = \ln \sec x + \tan x + C$ |
| 4. $\int \sin x dx = -\cos x + C$ | 12. $\int \operatorname{cosec} x dx = \ln \operatorname{cosec} x - \cot x + C$ |
| 5. $\int \cos x dx = \sin x + C$ | 13. $\int \sinh x dx = \cosh x + C$ |
| 6. $\int \tan x dx = -\ln \cos x + C$ | 14. $\int \cosh x dx = \sinh x + C$ |
| 7. $\int \cot x dx = \ln \sin x + C$ | 15. $\int \frac{dx}{\sqrt{a^2 - x^2}} = \sin^{-1}\left(\frac{x}{a}\right) + C \quad (x < a)$ |
| 8. $\int \frac{dx}{a^2 + x^2} = \frac{1}{a} \tan^{-1}\left(\frac{x}{a}\right) + C$ | 16. $\int \frac{dx}{a^2 - x^2} = \frac{1}{2a} \ln\left \frac{a+x}{a-x}\right + C$ |
| 17. $\int \frac{dx}{\sqrt{x^2 + a^2}} = \sinh^{-1}\left(\frac{x}{a}\right) + C = \ln\left(x + \sqrt{x^2 + a^2}\right) + C'$ | |
| 18. $\int \frac{dx}{\sqrt{x^2 - a^2}} = \cosh^{-1}\left(\frac{x}{a}\right) + C = \ln\left(x + \sqrt{x^2 - a^2}\right) + C' \quad (x > a)$ | |

Linearity: $\int (\lambda f(x) + \mu g(x)) dx = \lambda \int f(x) dx + \mu \int g(x) dx$

Integration by substitution: $\int f(u(x)) \frac{du}{dx} dx = \int f(u) du$

Integration by parts: $\int f(x)g'(x) dx = f(x)g(x) - \int f'(x)g(x) dx$