

FORMULA SHEET

Trigonometric Functions and Identities

$$\begin{aligned}\sin^2 x + \cos^2 x &= 1 & 1 + \tan^2 x &= \sec^2 x & 1 + \cot^2 x &= \csc^2 x \\ \sin(x + y) &= \sin x \cos y + \sin y \cos x & \cos(x + y) &= \cos x \cos y - \sin x \sin y\end{aligned}$$

Single-Variable Integrals (the constants are omitted)

$$\begin{aligned}\int x^n dx &= \frac{x^{n+1}}{n+1} \quad (n \neq -1) & \int \frac{1}{x} dx &= \ln |x| \\ \int e^{ax} dx &= \frac{e^{ax}}{a} & \int \sin x dx &= -\cos x \\ \int \cos x dx &= \sin x & \int \sec^2 x dx &= \tan x \\ \int -\csc^2 x dx &= \cot x & \int \sec x \tan x dx &= \sec x \\ \int \csc x \cot x dx &= -\csc x & \int \sec x dx &= \ln |\sec x + \tan x| \\ \int \csc x dx &= \ln |\csc x - \cot x| & \int \tan x dx &= \ln |\sec x| \\ \int \cot x dx &= \ln |\sin x| & \int \frac{1}{x^2 + a^2} dx &= \frac{1}{a} \arctan\left(\frac{x}{a}\right) \\ \int \frac{1}{\sqrt{a^2 - x^2}} dx &= \arcsin\left(\frac{x}{a}\right) & \int \frac{1}{x^2 - a^2} dx &= \frac{1}{2a} \ln \left| \frac{x-a}{x+a} \right|\end{aligned}$$