Matemática Básica

- Fatoração:
  - $a^2 - b^2 = (a + b)(a - b)$
  - $a^3 \pm b^3 = (a \pm b)(a^2 \mp ab + b^2)$
- Logaritmos:
  - $\ln(ab) = \ln a + \ln b$
  - $\ln(a^b) = b \ln a$
  - $e^{\ln(a)} = a$
  - $\ln\left(\frac{a}{b}\right) = \ln a - \ln b$

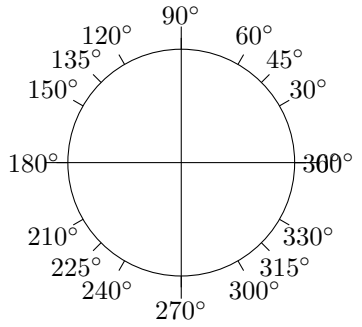
Derivadas

- $\frac{d}{dx}c = 0$
- $\frac{d}{dx}[cf(x)] = cf'(x)$
- $\frac{d}{dx}[f(x) \pm g(x)] = f'(x) \pm g'(x)$
- $\frac{d}{dx}[f(x)g(x)] = f'(x)g(x) + f(x)g'(x)$
- $\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] = \frac{f'(x)g(x) - f(x)g'(x)}{g(x)^2}$
- $\frac{d}{dx}x^n = nx^{n-1}$
- $\frac{d}{dx}e^x = e^x$
- $\frac{d}{dx}a^x = a^x \ln a$
- $\frac{d}{dx}\ln x = \frac{1}{x}$
- $\frac{d}{dx}\log_a x = \frac{1}{x \ln a}$
- $\frac{d}{dx}\sin x = \cos x$
- $\frac{d}{dx}\cos x = -\sin x$
- $\frac{d}{dx}\tan x = \sec^2 x$
- $\frac{d}{dx}\cot x = -\csc^2 x$
- $\frac{d}{dx}\sec x = \sec x \tan x$
- $\frac{d}{dx}\csc x = -\csc x \cot x$
- $\frac{d}{dx}\arcsin x = \frac{1}{\sqrt{1-x^2}}$
- $\frac{d}{dx}\arccos x = -\frac{1}{\sqrt{1-x^2}}$
- $\frac{d}{dx}\arctan x = \frac{1}{1+x^2}$
- $\frac{d}{dx}\sinh x = \cosh x$
- $\frac{d}{dx}\cosh x = \sinh x$

Integrais

- $\int k dx = kx + C$
- $\int x^n dx = \frac{x^{n+1}}{n+1} + C \ (n \neq -1)$
- $\int \frac{1}{x} dx = \ln|x| + C$
- $\int e^x dx = e^x + C$
- $\int a^x dx = \frac{a^x}{\ln a} + C$
- $\int \sin x dx = -\cos x + C$
- $\int \cos x dx = \sin x + C$
- $\int \tan x dx = \ln|\sec x| + C$
- $\int \cot x dx = \ln|\sin x| + C$
- $\int \sec x dx = \ln|\sec x + \tan x| + C$
- $\int \csc x dx = -\ln|\csc x + \cot x| + C$
- $\int \sec^2 x dx = \tan x + C$
- $\int \csc^2 x dx = -\cot x + C$
- $\int \sec x \tan x dx = \sec x + C$
- $\int \csc x \cot x dx = -\csc x + C$
- $\int \frac{1}{\sqrt{a^2-x^2}} dx = \arcsin\left(\frac{x}{a}\right) + C$
- $\int \frac{1}{a^2+x^2} dx = \frac{1}{a}\arctan\left(\frac{x}{a}\right) + C$
- $\int \frac{1}{x^2-a^2} dx = \frac{1}{2a}\ln\left|\frac{x-a}{x+a}\right| + C$
- $\int \sqrt{a^2 - x^2} dx = \frac{x}{2}\sqrt{a^2 - x^2} + \frac{a^2}{2}\arcsin\left(\frac{x}{a}\right) + C$
- $\int \frac{1}{\sqrt{x^2 \pm a^2}} dx = \ln|x + \sqrt{x^2 \pm a^2}| + C$
- Integração por partes: $\int udv = uv - \int vdu$

Círculo Trigonométrico



Valores Trigonométricos Notáveis

Ângulo	sin	cos	tan
0°	0	1	0
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
45°	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90°	1	0	indef.
120°	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$
180°	0	-1	0

Identidades Trigonométricas

- Fundamentais:
  - $\sin^2 x + \cos^2 x = 1$
  - $1 + \tan^2 x = \sec^2 x$
  - $1 + \cot^2 x = \csc^2 x$
  - $\frac{1}{\cos x} = \sec x$
  - $\frac{1}{\sin x} = \csc x$
- Soma/Subtração:
  - $\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$
  - $\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$
- Arco duplo:
  - $\sin(2x) = 2 \sin x \cos x$
  - $\cos(2x) = \cos^2 x - \sin^2 x$
  - $\cos(2x) = 2\cos^2 x - 1$
  - $\cos(2x) = 1 - 2\sin^2 x$