TRIGONOMETRÍA

$$\sin(\alpha+\beta) = \sin\alpha \cdot \cos\beta + \cos\alpha \cdot \sin\beta$$

$$\cos(\alpha+\beta) = \cos\alpha \cdot \cos\beta - \sin\alpha \cdot \sin\beta$$

$$\sin^2 x + \cos^2 x = 1$$

$$\tan^2 x + 1 = \sec^2 x$$

$$\cosh^2 x - \sinh^2 x = 1$$

$$\sin(2x) = 2\sin x \cdot \cos x$$

$$\tan x = \frac{\sin x}{\cos x}$$

$$\cot x = \frac{\cos x}{\sin x}$$

$$\sec x = \frac{1}{\cos x}$$

$$\csc x = \frac{1}{\sin x}$$

$$\sin^2 x = \frac{1-\cos(2x)}{2}$$

$$\cos^2 x = \frac{1+\cos(2x)}{2}$$

$$\sinh x = \frac{e^x - e^{-x}}{2}$$

$$\cosh x = \frac{e^x + e^{-x}}{2}$$

DERIVADAS

$$f(x) = k \quad \Longrightarrow \quad f'(x) = 0$$

$$f(x) = x \quad \Longrightarrow \quad f'(x) = 1$$

$$f(x) = cx \quad \Longrightarrow \quad f'(x) = c$$ (regla del producto)

$$f(x) = x^n \quad \Longrightarrow \quad f'(x) = n \cdot x^{n-1}$$

$$f(x) = \ln x \quad \Longrightarrow \quad f'(x) = \frac{1}{x}$$

$$f(x) = \sin x \quad \Longrightarrow \quad f'(x) = \cos x$$

$$f(x) = \cos x \quad \Longrightarrow \quad f'(x) = -\sin x$$

$$f(x) = e^x \quad \Longrightarrow \quad f'(x) = e^x$$

$$f(x) = \log_\alpha x \quad \Longrightarrow \quad f'(x) = \frac{1}{x \cdot \ln\alpha}$$

$$f(x) = \tan x \quad \Longrightarrow \quad f'(x) = \sec^2 x$$

$$f(x) = \cot x \quad \Longrightarrow \quad f'(x) = -\csc^2 x$$

$$f(x) = \sec x \quad \Longrightarrow \quad f'(x) = \sec x \cdot \tan x$$

$$f(x) = \csc x \quad \Longrightarrow \quad f'(x) = -\csc x \cdot \cot x$$

$$f(x) = \alpha^x \quad \Longrightarrow \quad f'(x) = \alpha^x \cdot \ln\alpha$$

$$f(x) = \arctan x \quad \Longrightarrow \quad f'(x) = \frac{x}{1+x^2}$$

$$f(x) = \arcsin x \quad \Longrightarrow \quad f'(x) = \frac{1}{\sqrt{1-x^2}}$$

$$f(x) = \arccos x \quad \Longrightarrow \quad f'(x) = -\frac{1}{\sqrt{1-x^2}}$$

$$f(x) = \sinh x \quad \Longrightarrow \quad f'(x) = \cosh x$$

$$f(x) = \cosh x \quad \Longrightarrow \quad f'(x) = \sinh x$$

INTEGRALES

$$\int dx = \int 1 \; dx = x + C$$

$$\int x^n \; dx = \frac{x^{n+1}}{n+1} + C$$

$$\int \frac{1}{x} \; dx = \ln|x| + C$$

$$\int e^x \; dx = e^x + C$$

$$\int \sin x \; dx = -\cos x + C$$

$$\int \cos x \; dx = \sin x + C$$

$$\int \alpha^x \; dx = \frac{\alpha^x}{\ln\alpha} + C$$

$$\int \sinh x \; dx = \cosh x + C$$

$$\int \cosh x \; dx = \sinh x + C$$

$$\int \sec^2 x \; dx = \tan x + C$$

$$\int \csc^2 x \; dx = -\cot x + C$$

$$\int \sec x \cdot \tan x \; dx = \sec x + C$$

$$\int \csc x \cdot \cot x \; dx = -\csc x + C$$

$$\int \frac{1}{1+x^2} \; dx = \arctan x + C$$

$$\int \frac{1}{\sqrt{1-x^2}} \; dx = \arcsin x + C$$

$$\int \frac{1}{1-x^2} \; dx = Argtanh\; x + C$$

$$\int \frac{1}{\sqrt{1+x^2}} \; dx = Argsinh\; x + C$$

$$\int \frac{1}{\sqrt{x^2-1}} \; dx = Argcosh\; x + C$$

LOGARITMOS

$\log_a 1 = 0$ $\quad a^{\log_a x} = x$ $\quad \log_a a = 1$ $\quad \log_{b^n}(a^n) = \log_b a$

$\log_a(x/y) = \log_a x - \log_a y$ $\quad \log_b(a^n) = n \cdot \log_b a$ $\quad \log_b n = x \iff b^x = n$

$$\log_a(x \cdot y) = \log_a x + \log_a y \qquad \log_b a = \frac{1}{\log_a b} \qquad \log_b a = \frac{\log_c a}{\log_c b}$$

VALOR ABSOLUTO

$$|a| = |-a| \qquad |ab| = |a||b| \qquad \left|\frac{a}{b}\right| = \frac{|a|}{|b|} \qquad |x+y| \le |x| + |y|$$

LÍMITES

$$\lim_{x\to 0} \frac{\sin x}{x} = 1 \qquad \lim_{x\to 0} \frac{x}{\sin x} = 1 \qquad \lim_{x\to 0} \frac{\tan x}{x} = 1$$

$$\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^x = e \qquad \lim_{x\to\infty}\left(1+\frac{k}{x}\right)^x = e^k \qquad \lim_{x\to\infty}\left(1+\frac{k}{x+a}\right)^{x+a} = e^k$$

REGLAS DE DERIVACIÓN

$$y = f(x) \cdot g(x) \quad \Longrightarrow \quad y' = f'(x) \cdot g(x) + f(x) \cdot g'(x)$$

$$y = \frac{f(x)}{g(x)} \quad \Longrightarrow \quad y' = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{g^2(x)}$$

Regla de la cadena: $\quad h(x) = f\big(g(x)\big) \quad \Longrightarrow \quad h'(x) = f'\big(g(x)\big)\; g'(x)$

PROPIEDAD FUNDAMENTAL DE LA DIVISIÓN

$$\begin{array}{l|l} \mathrm{D(x)} & \mathrm{d(x)} \\ \cline{2-2} \mathrm{R(x)} & \mathrm{c(x)} \end{array} \qquad D(x) = d(x) \cdot c(x) + R(x) \qquad \frac{D(x)}{d(x)} = c(x) + \frac{R(x)}{d(x)}$$

ÁLGEBRA LINEAL

Teorema de Laplace:

$$\det(B) = \sum_{j=1}^{n} (-1)^{i+j} \cdot B_{i,j} \cdot M_{i,j}$$

Donde $M_{i,j}$ es el determinante de la submatriz obtenida al remover la $i-ésima$ fila y la $j-ésima$ columna de B.

CÓNICAS

Para saber el centro (h,k) sustituir x con $(x-h)$ e y con $(y-k)$

CIRCUNFERENCIA

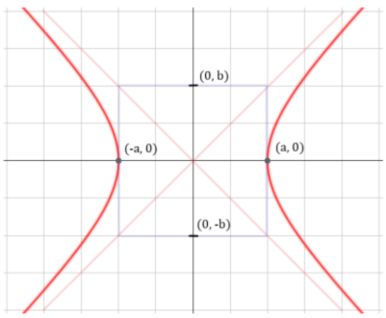
$$x^2 + y^2 = r^2$$

ELIPSE

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

HIPÉRBOLA

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$



$$\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$$