

## Límites Especiales

$$\begin{aligned} \lim_{x \rightarrow 0} \frac{\sin x}{x} &= 1 & \lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x &= e \\ \lim_{x \rightarrow 0} \frac{x}{\sin x} &= 1 & \lim_{x \rightarrow \infty} \left(1 + \frac{k}{x}\right)^x &= e^k \\ \lim_{x \rightarrow 0} \frac{a^x - 1}{x} &= \ln(a) & \lim_{x \rightarrow \infty} \left(1 + \frac{k}{x+a}\right)^{x+a} &= e^k \end{aligned}$$

## Derivadas

$$\begin{aligned} f(x) = k &\Rightarrow f'(x) = 0 \\ f(x) = x &\Rightarrow f'(x) = 1 \\ f(x) = cx &\Rightarrow f'(x) = c \\ f(x) = x^n &\Rightarrow f'(x) = n x^{n-1} \\ f(x) = \ln x &\Rightarrow f'(x) = \frac{1}{x} \\ f(x) = \sin x &\Rightarrow f'(x) = \cos x \\ f(x) = \cos x &\Rightarrow f'(x) = -\sin x \\ f(x) = e^x &\Rightarrow f'(x) = e^x \\ f(x) = \log_a x &\Rightarrow f'(x) = \frac{1}{x \ln a} \\ f(x) = \tan x &\Rightarrow f'(x) = \sec^2 x \\ f(x) = \cot x &\Rightarrow f'(x) = -\csc^2 x \\ f(x) = \sec x &\Rightarrow f'(x) = \sec x \tan x \\ f(x) = \csc x &\Rightarrow f'(x) = -\csc x \cot x \\ f(x) = a^x &\Rightarrow f'(x) = a^x \ln a \\ f(x) = \tan^{-1} x &\Rightarrow f'(x) = \frac{1}{1+x^2} \\ f(x) = \sin^{-1} x &\Rightarrow f'(x) = \frac{1}{\sqrt{1-x^2}} \\ f(x) = \cos^{-1} x &\Rightarrow f'(x) = -\frac{1}{\sqrt{1-x^2}} \\ f(x) = \sinh x &\Rightarrow f'(x) = \cosh x \\ f(x) = \cosh x &\Rightarrow f'(x) = \sinh x \\ f(x) = \tanh^{-1} x &\Rightarrow f'(x) = \frac{1}{1-x^2} \\ f(x) = \sinh^{-1} x &\Rightarrow f'(x) = \frac{1}{\sqrt{1+x^2}} \\ f(x) = \cosh^{-1} x &\Rightarrow f'(x) = \frac{1}{\sqrt{x^2-1}} \end{aligned}$$

## Reglas de Derivación

$$\begin{aligned} y = f(x)g(x) &\Rightarrow y' = f'(x)g(x) + f(x)g'(x) \\ y = \frac{f(x)}{g(x)} &\Rightarrow y' = \frac{f'(x)g(x) - f(x)g'(x)}{g^2(x)} \\ h(x) = f(g(x)) &\Rightarrow h'(x) = f'(g(x)) \cdot g'(x) \end{aligned}$$

## Integrales

$$\begin{aligned} \int dx &= x + C \\ \int x^n dx &= \frac{x^{n+1}}{n+1} + C \\ \int \frac{1}{x} dx &= \ln|x| + C \\ \int e^x dx &= e^x + C \\ \int \sin x dx &= -\cos x + C \\ \int \cos x dx &= \sin x + C \\ \int a^x dx &= \frac{a^x}{\ln a} + C \\ \int \sinh x dx &= \cosh x + C \\ \int \cosh x dx &= \sinh x + C \\ \int \sec^2 x dx &= \tan x + C \\ \int \csc^2 x dx &= -\cot x + C \\ \int \sec x \tan x dx &= \sec x + C \\ \int \csc x \cot x dx &= -\csc x + C \\ \int \frac{1}{1+x^2} dx &= \tan^{-1} x + C \\ \int \frac{1}{\sqrt{1-x^2}} dx &= \sin^{-1} x + C \\ \int \frac{1}{1-x^2} dx &= \tanh^{-1} x + C \\ \int \frac{1}{\sqrt{1+x^2}} dx &= \sinh^{-1} x + C \\ \int \frac{1}{\sqrt{x^2-1}} dx &= \cosh^{-1} x + C \end{aligned}$$