Límites Especiales

$$\lim_{x\to 0}\frac{\sin x}{x}=1 \qquad \lim_{x\to\infty}\left(1+\frac{1}{x}\right)^{x}=e$$

$$\lim_{x\to 0}\frac{x}{\sin x}=1 \qquad \lim_{x\to\infty}\left(1+\frac{k}{x}\right)^{x}=e^{k}$$

$$\lim_{x\to 0}\frac{a^{x}-1}{x}=\ln(a) \qquad \lim_{x\to\infty}\left(1+\frac{k}{x+a}\right)^{x+a}=e^{k}$$

Reglas de Derivación

$$y=f(x)\,g(x) \quad\Rightarrow\quad y'=f'(x)g(x)+f(x)g'(x)$$

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

$$h(x)=f(g(x)) \quad\Rightarrow\quad h'(x)=f'(g(x))\cdot g'(x)$$

Derivadas

$$f(x)=k \Rightarrow f'(x)=0$$

$$f(x)=x \Rightarrow f'(x)=1$$

$$f(x)=cx \Rightarrow f'(x)=c$$

$$f(x)=x^{n} \Rightarrow f'(x)=n\,x^{n-1}$$

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

$$f(x)=\sin x \Rightarrow f'(x)=\cos x$$

$$f(x)=\cos x \Rightarrow f'(x)=-\sin x$$

$$f(x)=e^{x} \Rightarrow f'(x)=e^{x}$$

$$f(x)=\log_{a} x \Rightarrow f'(x)=\frac{1}{x\ln a}$$

$$f(x)=\tan x \Rightarrow f'(x)=\sec^{2} x$$

$$f(x)=\cot x \Rightarrow f'(x)=-\csc^{2} x$$

$$f(x)=\sec x \Rightarrow f'(x)=\sec x\,\tan x$$

$$f(x)=\csc x \Rightarrow f'(x)=-\csc x\,\cot x$$

$$f(x)=a^{x} \Rightarrow f'(x)=a^{x}\ln a$$

$$f(x)=\tan^{-1} x \Rightarrow f'(x)=\frac{1}{1+x^{2}}$$

$$f(x)=\sin^{-1} x \Rightarrow f'(x)=\frac{1}{\sqrt{1-x^{2}}}$$

$$f(x)=\cos^{-1} x \Rightarrow f'(x)=-\frac{1}{\sqrt{1-x^{2}}}$$

$$f(x)=\sinh x \Rightarrow f'(x)=\cosh x$$

$$f(x)=\cosh x \Rightarrow f'(x)=\sinh x$$

$$f(x)=\tanh^{-1} x \Rightarrow f'(x)=\frac{1}{1-x^{2}}$$

$$f(x)=\sinh^{-1} x \Rightarrow f'(x)=\frac{1}{\sqrt{1+x^{2}}}$$

$$f(x)=\cosh^{-1} x \Rightarrow f'(x)=\frac{1}{\sqrt{x^{2}-1}}$$

Integrales

$$\int dx = x+C$$

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

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

$$\int e^{x}\,dx = e^{x}+C$$

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

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

$$\int \tan x\,dx = -\ln|\cos x|+C$$

$$\int \sin^{2} x\,dx = \tfrac{x}{2}-\tfrac{\sin(2x)}{4}+C$$

$$\int \cos^{2} x\,dx = \tfrac{x}{2}+\tfrac{\sin(2x)}{4}+C$$

$$\int a^{x}\,dx = \frac{a^{x}}{\ln a}+C$$

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

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

$$\int \sec^{2} x\,dx = \tan x+C$$

$$\int \csc^{2} x\,dx = -\cot x+C$$

$$\int \sec x\,\tan x\,dx = \sec x+C$$

$$\int \csc x\,\cot x\,dx = -\csc x+C$$

$$\int \frac{1}{1+x^{2}}\,dx = \tan^{-1} x+C$$

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

$$\int \frac{1}{1-x^{2}}\,dx = \tanh^{-1} x+C$$

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

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