

# LISTA DE DERIVADAS

## Reglas

1. **Constante:**  $\frac{d}{dx} c = 0$
2. **Múltiplo constante:**  $\frac{d}{dx} cf(x) = c f'(x)$
3. **Suma:**  $\frac{d}{dx} [f(x) \pm g(x)] = f'(x) \pm g'(x)$
4. **Producto:**  $\frac{d}{dx} f(x)g(x) = f(x)g'(x) + g(x)f'(x)$
5. **Cociente:**  $\frac{d}{dx} \frac{f(x)}{g(x)} = \frac{g(x)f'(x) - f(x)g'(x)}{[g(x)]^2}$
6. **Cadena:**  $\frac{d}{dx} f(g(x)) = f'(g(x))g'(x)$
7. **Potencia:**  $\frac{d}{dx} x^n = nx^{n-1}$
8. **Potencia:**  $\frac{d}{dx} [g(x)]^n = n[g(x)]^{n-1}g'(x)$

## Funciones

### Trigonométricas:

9.  $\frac{d}{dx} \operatorname{sen} x = \cos x$
10.  $\frac{d}{dx} \cos x = -\operatorname{sen} x$
11.  $\frac{d}{dx} \tan x = \sec^2 x$
12.  $\frac{d}{dx} \cot x = -\operatorname{csc}^2 x$
13.  $\frac{d}{dx} \sec x = \sec x \tan x$
14.  $\frac{d}{dx} \csc x = -\csc x \cot x$

### Trigonométricas inversas:

15.  $\frac{d}{dx} \operatorname{sen}^{-1} x = \frac{1}{\sqrt{1-x^2}}$
16.  $\frac{d}{dx} \cos^{-1} x = -\frac{1}{\sqrt{1-x^2}}$
17.  $\frac{d}{dx} \tan^{-1} x = \frac{1}{1+x^2}$
18.  $\frac{d}{dx} \cot^{-1} x = -\frac{1}{1+x^2}$
19.  $\frac{d}{dx} \sec^{-1} x = \frac{1}{|x|\sqrt{x^2-1}}$
20.  $\frac{d}{dx} \csc^{-1} x = -\frac{1}{|x|\sqrt{x^2-1}}$

### Hiperbólicas:

21.  $\frac{d}{dx} \operatorname{senh} x = \cosh x$
22.  $\frac{d}{dx} \cosh x = \operatorname{senh} x$
23.  $\frac{d}{dx} \tanh x = \operatorname{sech}^2 x$
24.  $\frac{d}{dx} \coth x = -\operatorname{csch}^2 x$
25.  $\frac{d}{dx} \operatorname{sech} x = -\operatorname{sech} x \tanh x$
26.  $\frac{d}{dx} \operatorname{csch} x = -\operatorname{csch} x \coth x$

### Hiperbólicas inversas:

27.  $\frac{d}{dx} \operatorname{senh}^{-1} x = \frac{1}{\sqrt{x^2+1}}$
28.  $\frac{d}{dx} \cosh^{-1} x = \frac{1}{\sqrt{x^2-1}}$
29.  $\frac{d}{dx} \tanh^{-1} x = \frac{1}{1-x^2}$
30.  $\frac{d}{dx} \coth^{-1} x = \frac{1}{1-x^2}$
31.  $\frac{d}{dx} \operatorname{sech}^{-1} x = -\frac{1}{x\sqrt{1-x^2}}$
32.  $\frac{d}{dx} \operatorname{csch}^{-1} x = -\frac{1}{|x|\sqrt{x^2+1}}$

### Exponencial:

33.  $\frac{d}{dx} e^x = e^x$
34.  $\frac{d}{dx} b^x = b^x (\ln b)$

### Logarítmica:

35.  $\frac{d}{dx} \ln |x| = \frac{1}{x}$
36.  $\frac{d}{dx} \log_b x = \frac{1}{x(\ln b)}$

# BREVE TABLA DE INTEGRALES

1.  $\int u^n du = \frac{u^{n+1}}{n+1} + C, n \neq -1$
3.  $\int e^u du = e^u + C$
5.  $\int \operatorname{sen} u du = -\cos u + C$
7.  $\int \sec^2 u du = \tan u + C$
9.  $\int \sec u \tan u du = \sec u + C$
11.  $\int \tan u du = -\ln|\cos u| + C$
13.  $\int \sec u du = \ln|\sec u + \tan u| + C$
15.  $\int u \operatorname{sen} u du = \operatorname{sen} u - u \cos u + C$
17.  $\int \operatorname{sen}^2 u du = \frac{1}{2}u - \frac{1}{4}\operatorname{sen} 2u + C$
19.  $\int \tan^2 u du = \tan u - u + C$
21.  $\int \operatorname{sen}^3 u du = -\frac{1}{3}(2 + \operatorname{sen}^2 u) \cos u + C$
23.  $\int \tan^3 u du = \frac{1}{2}\tan^2 u + \ln|\cos u| + C$
25.  $\int \sec^3 u du = \frac{1}{2}\sec u \tan u + \frac{1}{2}\ln|\sec u + \tan u| + C$
27.  $\int \operatorname{sen} au \cos bu du = \frac{\operatorname{sen}(a-b)u}{2(a-b)} - \frac{\operatorname{sen}(a+b)u}{2(a+b)} + C$
29.  $\int e^{au} \operatorname{sen} bu du = \frac{e^{au}}{a^2 + b^2}(a \operatorname{sen} bu - b \cos bu) + C$
31.  $\int \operatorname{senh} u du = \cosh u + C$
33.  $\int \operatorname{sech}^2 u du = \tanh u + C$
35.  $\int \tanh u du = \ln(\cosh u) + C$
37.  $\int \ln u du = u \ln u - u + C$
39.  $\int \frac{1}{\sqrt{a^2 - u^2}} du = \operatorname{sen}^{-1} \frac{u}{a} + C$
41.  $\int \sqrt{a^2 - u^2} du = \frac{u}{2}\sqrt{a^2 - u^2} + \frac{a^2}{2}\operatorname{sen}^{-1} \frac{u}{a} + C$
43.  $\int \frac{1}{a^2 + u^2} du = \frac{1}{a}\tan^{-1} \frac{u}{a} + C$
2.  $\int \frac{1}{u} du = \ln|u| + C$
4.  $\int a^u du = \frac{1}{\ln a} a^u + C$
6.  $\int \cos u du = \operatorname{sen} u + C$
8.  $\int \csc^2 u du = -\cot u + C$
10.  $\int \csc u \cot u du = -\csc u + C$
12.  $\int \cot u du = \ln|\operatorname{sen} u| + C$
14.  $\int \csc u du = \ln|\csc u - \cot u| + C$
16.  $\int u \cos u du = \cos u + u \operatorname{sen} u + C$
18.  $\int \cos^2 u du = \frac{1}{2}u + \frac{1}{4}\operatorname{sen} 2u + C$
20.  $\int \cot^2 u du = -\cot u - u + C$
22.  $\int \cos^3 u du = \frac{1}{3}(2 + \cos^2 u) \operatorname{sen} u + C$
24.  $\int \cot^3 u du = -\frac{1}{2}\cot^2 u - \ln|\operatorname{sen} u| + C$
26.  $\int \csc^3 u du = -\frac{1}{2}\csc u \cot u + \frac{1}{2}\ln|\csc u - \cot u| + C$
28.  $\int \cos au \cos bu du = \frac{\operatorname{sen}(a-b)u}{2(a-b)} + \frac{\operatorname{sen}(a+b)u}{2(a+b)} + C$
30.  $\int e^{au} \cos bu du = \frac{e^{au}}{a^2 + b^2}(a \cos bu + b \operatorname{sen} bu) + C$
32.  $\int \cosh u du = \operatorname{senh} u + C$
34.  $\int \operatorname{csch}^2 u du = -\coth u + C$
36.  $\int \coth u du = \ln|\operatorname{senh} u| + C$
38.  $\int u \ln u du = \frac{1}{2}u^2 \ln u - \frac{1}{4}u^2 + C$
40.  $\int \frac{1}{\sqrt{a^2 + u^2}} du = \ln|u + \sqrt{a^2 + u^2}| + C$
42.  $\int \sqrt{a^2 + u^2} du = \frac{u}{2}\sqrt{a^2 + u^2} + \frac{a^2}{2}\ln|u + \sqrt{a^2 + u^2}| + C$
44.  $\int \frac{1}{a^2 - u^2} du = \frac{1}{2a}\ln\left|\frac{a+u}{a-u}\right| + C$