Formulario de Derivadas

Una selección de derivadas fundamentales para cálculo diferencial.

Reglas Básicas y Potencias

$$\frac{d}{dx}\Big[c\Big] = 0$$

$$\frac{d}{dx}\Big[x\Big] = 1$$

$$\frac{d}{dx}\Big[x^n\Big] = nx^{n-1}$$

$$\frac{d}{dx}\Big[cf(x)\Big] = cf'(x)$$

$$\frac{d}{dx}\Big[f(x) \pm g(x)\Big] = f'(x) \pm g'(x)$$

Exponenciales y Logarítmicas

$$\frac{d}{dx}\Big[e^x\Big] = e^x$$

$$\frac{d}{dx}\Big[a^x\Big] = a^x \ln a$$

$$\frac{d}{dx}\Big[\ln x\Big] = \frac{1}{x}$$

$$\frac{d}{dx}\Big[\log_a x\Big] = \frac{1}{x \ln a}$$

Reglas de Producto y Cociente

$$\frac{d}{dx}\Big[f(x)g(x)\Big] = f'(x)g(x) + f(x)g'(x)$$

$$\frac{d}{dx}\Big[\frac{f(x)}{g(x)}\Big] = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

Regla de la Cadena

$$\frac{d}{dx}\Big[f(g(x))\Big] = f'(g(x))g'(x)$$

Funciones Trigonométricas

$$\frac{d}{dx}\Big[\sin x\Big] = \cos x$$

$$\frac{d}{dx}\Big[\cos x\Big] = -\sin x$$

$$\frac{d}{dx}\Big[\tan x\Big] = \sec^2 x$$

$$\frac{d}{dx}\Big[\cot x\Big] = -\csc^2 x$$

$$\frac{d}{dx}\Big[\sec x\Big] = \sec x \tan x$$

$$\frac{d}{dx}\Big[\csc x\Big] = -\csc x \cot x$$

Funciones Trigonométricas Inversas

$$\frac{d}{dx}\Big[\arcsin x\Big] = \frac{1}{\sqrt{1-x^2}}$$

$$\frac{d}{dx}\Big[\arccos x\Big] = -\frac{1}{\sqrt{1-x^2}}$$

$$\frac{d}{dx}\Big[\arctan x\Big] = \frac{1}{1+x^2}$$

$$\frac{d}{dx}\Big[\operatorname{arccot} x\Big] = -\frac{1}{1+x^2}$$

$$\frac{d}{dx}\Big[\operatorname{arcsec} x\Big] = \frac{1}{|x|\sqrt{x^2-1}}$$

$$\frac{d}{dx}\Big[\operatorname{arccsc} x\Big] = -\frac{1}{|x|\sqrt{x^2-1}}$$

Funciones Hiperbólicas

$$\frac{d}{dx}\left[\sinh x\right] = \cosh x$$
$$\frac{d}{dx}\left[\cosh x\right] = \sinh x$$
$$\frac{d}{dx}\left[\tanh x\right] = \operatorname{sech}^2 x$$
$$\frac{d}{dx}\left[\coth x\right] = -\operatorname{csch}^2 x$$
$$\frac{d}{dx}\left[\operatorname{sech} x\right] = -\operatorname{sech} x \tanh x$$
$$\frac{d}{dx}\left[\operatorname{csch} x\right] = -\operatorname{csch} x \coth x$$

Derivación Logarítmica

Para $y = f(x)$, la derivada de $\ln(y)$ es:

$$\frac{d}{dx}[\ln(y)] = \frac{y'}{y}$$

Funciones Hiperbólicas Inversas

$$\frac{d}{dx}\left[\operatorname{arsinh} x\right] = \frac{1}{\sqrt{x^2+1}}$$
$$\frac{d}{dx}\left[\operatorname{arcosh} x\right] = \frac{1}{\sqrt{x^2-1}}$$
$$\frac{d}{dx}\left[\operatorname{artanh} x\right] = \frac{1}{1-x^2}$$
$$\frac{d}{dx}\left[\operatorname{arcoth} x\right] = \frac{1}{1-x^2}$$
$$\frac{d}{dx}\left[\operatorname{arsech} x\right] = -\frac{1}{x\sqrt{1-x^2}}$$
$$\frac{d}{dx}\left[\operatorname{arcsch} x\right] = -\frac{1}{|x|\sqrt{1+x^2}}$$