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Regras de Derivação

$$\frac{d}{dx}c = 0$$

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

$$\frac{d}{dx}(f(x)g(x)) = f'(x)g(x) + f(x)g'(x) \text{ (regra do produto)}$$

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

$$\frac{d}{dx}f(g(x)) = f'(g(x))g'(x) \text{ (regra da cadeia)}$$

$$\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2} \text{ (regra do quociente)}$$

Tabela de Derivadas

$$\frac{d}{dx}x = 1$$

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

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

$$\frac{d}{dx}\log_a x = \frac{\log_a e}{x}$$

$$\frac{d}{dx}\operatorname{sen} x = \cos x$$

$$\frac{d}{dx}\cos x = -\operatorname{sen} x$$

$$\frac{d}{dx}\operatorname{tg} x = \sec^2 x$$

$$\frac{d}{dx}\sec x = \sec x \operatorname{tg} x$$

$$\frac{d}{dx}\operatorname{cotg} x = -\operatorname{cosec}^2 x$$

$$\frac{d}{dx}\operatorname{cosec} x = -\operatorname{cosec} x \operatorname{cotg} x$$

$$\frac{d}{dx}\operatorname{arcsen} x = \frac{1}{\sqrt{1-x^2}}$$

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

$$\frac{d}{dx}\operatorname{arctg} x = \frac{1}{1+x^2}$$

$$\frac{d}{dx}\operatorname{arccotg} x = \frac{-1}{1+x^2}$$

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

$$\frac{d}{dx}\operatorname{arccosec} x = \frac{-1}{|x|\sqrt{x^2-1}}$$

$$\frac{d}{dx}\operatorname{senh} x = \cosh x$$

$$\frac{d}{dx}\cosh x = \operatorname{senh} x$$

$$\frac{d}{dx}\operatorname{tgh} x = \operatorname{sech}^2 x$$

$$\frac{d}{dx}\operatorname{sech} x = -\operatorname{tgh} x \operatorname{sech} x$$

$$\frac{d}{dx}\operatorname{cotgh} x = -\operatorname{cossech}^2 x$$

$$\frac{d}{dx}\operatorname{csch} x = -\coth x \operatorname{cossech} x$$

$$\frac{d}{dx}\operatorname{arcsinh} x = \frac{1}{\sqrt{x^2+1}}$$

$$\frac{d}{dx}\operatorname{arccosh} x = \frac{1}{\sqrt{x^2-1}}$$

$$\frac{d}{dx}\operatorname{arctanh} x = \frac{1}{1-x^2}$$

$$\frac{d}{dx}\operatorname{arcsech} x = \frac{-1}{x\sqrt{1-x^2}}$$

$$\frac{d}{dx}\operatorname{arccoth} x = \frac{1}{1-x^2}$$

$$\frac{d}{dx}\operatorname{arccossech} x = \frac{-1}{|x|\sqrt{1+x^2}}$$

Identidades Trigonométricas

$$\operatorname{sen}^2 x + \cos^2 x = 1$$

$$1 + \operatorname{tg}^2 x = \sec^2 x$$

$$1 + \operatorname{cotg}^2 x = \operatorname{cosec}^2 x$$

$$\operatorname{sen}^2 x = \frac{1 - \cos 2x}{2}$$

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

$$\operatorname{sen}(a+b) = \operatorname{sen} a \cos b + \operatorname{sen} b \cos a$$

$$\operatorname{sen}(a-b) = \operatorname{sen} a \cos b - \operatorname{sen} b \cos a$$

$$\cos(a+b) = \cos a \cos b - \operatorname{sen} a \operatorname{sen} b$$

$$\cos(a-b) = \cos a \cos b + \operatorname{sen} a \operatorname{sen} b$$

$$\operatorname{sen} a \cos b = \frac{1}{2}(\operatorname{sen}(a-b) + \operatorname{sen}(a+b))$$

$$\operatorname{sen} a \operatorname{sen} b = \frac{1}{2}(\cos(a-b) - \cos(a+b))$$

$$\cos a \cos b = \frac{1}{2}(\cos(a-b) + \cos(a+b))$$

Regra de Leibniz

$$\frac{d}{dx}\int_{u(x)}^{v(x)} f(t)dt = f(v(x))v'(x) - f(u(x))u'(x).$$

Substituição Tangente do Ângulo Médio

$$z = \operatorname{tg}\frac{x}{2}, \quad dx = \frac{2dz}{1+z^2}, \quad \cos x = \frac{1-z^2}{1+z^2}, \quad \text{e} \quad \operatorname{sen} x = \frac{2z}{1+z^2}$$