Derivada de la función compuesta.

$$y=\left(f(x)\right)^n \quad \rightarrow \quad y'=n\left(f(x)\right)^{n-1}\ f'(x)$$

$$y=\left(3x^4-5x+8\right)^7 \quad \rightarrow \quad y'=7\left(3x^4-5x+8\right)^6\left(12x^3-5\right)$$

$$y=\left(Ln\ x\right)^5 \quad \rightarrow \quad y'=5\left(Ln\ x\right)^4\frac{1}{x}=\frac{5\left(Ln\ x\right)^4}{x}=\frac{5\ Ln^4 x}{x}$$

$$y=tg^3 x=\left(tg\ x\right)^3 \quad \rightarrow \quad y'=3\ tg^2 x\frac{1}{\cos^2 x}=\frac{3\ tg^2 x}{\cos^2 x}$$

$$y=\sqrt{f(x)} \quad \rightarrow \quad y'=\frac{f'(x)}{2\sqrt{f(x)}}$$

$$y=\sqrt{x^3-4x} \quad \rightarrow \quad y'=\frac{3x^2-4}{2\sqrt{x^3-4x}}$$

$$y=\sqrt{sen\ x} \quad \rightarrow \quad y'=\frac{\cos x}{2\sqrt{sen\ x}}$$

$$y=e^{f(x)} \quad \rightarrow \quad y'=f'(x)\,e^{f(x)}$$

$$y=e^{\cos x} \quad \rightarrow \quad y'=-sen\ x\,e^{\cos x}$$

$$y=e^{x^3-2x^2} \quad \rightarrow \quad y'=\left(3x^2-4x\right)e^{x^3-2x^2}$$

$$y=3^{tg\ x} \quad \rightarrow \quad y'=\frac{Ln\ 3}{\cos^2 x}3^{tg\ x}$$

$$y=7^{Ln\ x} \quad \rightarrow \quad y'=\frac{1}{x}7^{Ln\ x}\ Ln\ 7=\frac{7^{Ln\ x}\ Ln\ 7}{x}$$

$$y=Ln\left(f(x)\right) \quad \rightarrow \quad y'=\frac{f'(x)}{f(x)}$$

$$y=Ln\left(x^4-3x^2\right) \quad \rightarrow \quad y'=\frac{4x^3-6x}{x^4-3x^2}$$

$$y=Log_5\left(sen\ x\right) \quad \rightarrow \quad y'=\frac{\cos x}{\left(Ln\ 5\right)sen\ x}$$

$$y=sen\ f(x) \quad \rightarrow \quad y'=f'(x)\cos f(x)$$

$$y=sen\ e^x \quad \rightarrow \quad y'=e^x\cos e^x$$

$$y = sen\,(2x+5) \;\rightarrow\; y' = 2\cos(2x+5)$$

$$y = \cos f(x) \;\rightarrow\; y' = -f'(x)\,sen\,f(x)$$

$$y = \cos\left(x^2 + 2^x\right) \;\rightarrow\; y' = -\left(2x + 2^x\,Ln\,2\right) sen\left(x^2+2^x\right)$$

$$y = \cos(tg\,x) \;\rightarrow\; y' = -\frac{1}{tg^2 x}\,sen\,(tg\,x) = \frac{-\,sen\,(tg\,x)}{tg^2 x}$$

$$y = tg\,(f(x)) \;\rightarrow\; y' = \frac{f'(x)}{\cos^2(f(x))}$$

$$y = tg\left(3x^5 + 2x\right) \;\rightarrow\; y' = \frac{15x^4+2}{\cos^2\left(3x^5+2x\right)}$$

$$y = arcsen\,f(x) \;\rightarrow\; y' = \frac{f'(x)}{\sqrt{1-[f(x)]^2}}$$

$$y = arcsen\,x^2 \;\rightarrow\; y' = \frac{2x}{\sqrt{1-\left[x^2\right]^2}} = \frac{2x}{\sqrt{1-x^4}}$$

$$y = \arccos f(x) \;\rightarrow\; y' = \frac{-f'(x)}{\sqrt{1-[f(x)]^2}}$$

$$y = \arccos(sen\,x) \;\rightarrow\; y' = \frac{-\cos x}{\sqrt{1-[sen\,x]^2}} = \frac{-\cos x}{\sqrt{1-sen^2 x}}$$

$$y = arctg\,f(x) \;\rightarrow\; y' = \frac{f'(x)}{1+[f(x)]^2}$$

$$y = arctg\left(2x^2-3x+5\right) \;\rightarrow\; y' = \frac{4x-3}{1+\left(2x^2-3x+5\right)^2}$$

Ejercicios:

$$y = \left(\frac{x^2-1}{x+2}\right)^5 \;\rightarrow\; y' = 5\left(\frac{x^2-1}{x+2}\right)^4 \frac{2x(x+2)-1\cdot\left(x^2-1\right)}{(x+2)^2} = 5\left(\frac{x^2-1}{x+2}\right)^4 \frac{2x^2+4x-x^2+1}{(x+2)^2} =$$

$$= 5\left(\frac{x^2-1}{x+2}\right)^4 \frac{x^2+4x+1}{(x+2)^2}$$

$$y = \sqrt{x^2-4x} \;\rightarrow\; y' = \frac{2x-4}{2\sqrt{x^2-4x}} = \frac{x-2}{\sqrt{x^2-4x}}$$

$$y = \frac{x+1}{(x-2)^2} \;\rightarrow\; y' = \frac{1\cdot(x-2)^2 - (x+1)\,2(x-2)\cdot 1}{(x-2)^4} = \frac{x-2-2(x+1)}{(x-2)^3} = \frac{x-2-2x-2}{(x-2)^3} = \frac{-x-4}{(x-2)^3}$$

$$y = \frac{(2x+1)^2}{x-1} \;\rightarrow\; y' = \frac{2(2x+1)\,2\,(x-1) - (2x+1)^2\cdot 1}{(x-1)^2} = \frac{4x^2-8x-5}{(x-1)^2}$$

$$4(2x+1)(x-1) = 8x^2 - 8x + 4x - 4 = 8x^2 - 4x - 4$$

$$(2x+1)^2 = 4x^2 + 4x + 1$$

$$y = \frac{e^x}{(x-1)^2}$$

$$y = x^3\ 3^x + x^2\ sen\ x$$

$$y = Ln\left(\frac{x-1}{x+4}\right)$$