http://CursoDeCalculo.Wordpress.com
Profesor Raúl Vega Muñoz

DERIVADAS
"Regla del Cociente"

$$f(x) = \frac{2x^2 - 4x + 3}{2 - 3x}$$

#1 ✳ Identificar las Funciones de Sustitución

$$f(x) = \frac{2x^2 - 4x + 3}{2 - 3x} \quad \Rightarrow \quad f(x) = \frac{\boldsymbol{u}}{\boldsymbol{v}}$$

"Regla del Cociente"	
$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{\frac{du}{dx} \cdot v - \frac{dv}{dx} \cdot u}{v^2}$	$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{u' \cdot v - v' \cdot u}{v^2}$

$$f(x) = \frac{2x^2 - 4x + 3}{2 - 3x} \quad \Rightarrow \quad f(x) = \frac{\boldsymbol{u}}{\boldsymbol{v}}$$

$\boldsymbol{u} = 2x^2 - 4x + 3$	$\boldsymbol{v} = 2 - 3x$
$\boldsymbol{u'} = 4x - 4$	$\boldsymbol{v'} = -3$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{u' \cdot v - v' \cdot u}{v^2}$$

#2 ✳ Sustituir en la Fórmula

$$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{[4x-4][2-3x]-[-3][2x^2-4x+3]}{[2-3x]^2}$$

#3 ✳ Hacer operaciones y simplificar

$$\begin{aligned}[4x-4][2-3x] &= 8x-12x^2-8+12x \\ &= -12x^2+20x-8\end{aligned}$$

$$[-3][2x^2-4x+3] = -6x^2+12x-9$$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{[-12x^2+20x-8]-[-6x^2+12x-9]}{[2-3x]^2}$$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{-12x^2+20x-8+6x^2-12x+9}{[2-3x]^2}$$

$$\boxed{f'(x)=\frac{-6x^2+8x+1}{[2-3x]^2}}$$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{-(6x^2-8x-1)}{[2-3x]^2}$$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=-\frac{6x^2-8x-1}{[2-3x]^2}$$

$$f(x)=\frac{9}{\sqrt{x^2-16}}$$

#1 ✳ Identificar las Funciones de Sustitución

$$f(x)=\frac{9}{\sqrt{x^2-16}} \quad \Rightarrow \quad f(x)=\frac{\boldsymbol{u}}{\boldsymbol{v}}$$

$\boldsymbol{u}=9$	$\boldsymbol{v}=(x^2-16)^{\frac{1}{2}}$
$\boldsymbol{u}'=0$	$\boldsymbol{v}'=\ ?$

$$\frac{d}{dx}(cu^n) = n \cdot c \cdot u^{n-1} \cdot u'$$

$$\frac{d}{dx}(x^2-16)^{\frac{1}{2}} = \frac{1}{2}(x^2-16)^{\frac{1}{2}-1}(2x) = (x)(x^2-16)^{-\frac{1}{2}} = \frac{x}{(x^2-16)^{\frac{1}{2}}}$$

$\boldsymbol{u} = 9$	$\boldsymbol{v} = (x^2-16)^{\frac{1}{2}}$
$\boldsymbol{u'} = 0$	$\boldsymbol{v'} = \dfrac{x}{(x^2-16)^{\frac{1}{2}}}$

	"Regla del Cociente"
#2 ✳ Sustituir en la Fórmula	$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{u' \cdot v - v' \cdot u}{v^2}$

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{[0][(x^2-16)^{\frac{1}{2}}] - \left[\frac{x}{(x^2-16)^{\frac{1}{2}}}\right][9]}{\left[(x^2-16)^{\frac{1}{2}}\right]^2}$$

#3 ✳ Hacer operaciones y simplificar

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{[0][(x^2-16)^{\frac{1}{2}}] - \left[\frac{9x}{(x^2-16)^{\frac{1}{2}}}\right]}{\left[\sqrt{x^2-16}\right]^2}$$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{-\frac{9x}{(x^2-16)^{\frac{1}{2}}}}{x^2-16}$$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{-\frac{9x}{(x^2-16)^{\frac{1}{2}}}}{\frac{x^2-16}{1}}=-\frac{9x}{(x^2-16)^1(x^2-16)^{\frac{1}{2}}}$$

$$x^m x^n = x^{m+n}$$

$$\frac{d}{dx}\left(\frac{u}{v}\right)=-\frac{9x}{(x^2-16)^{\frac{3}{2}}}$$

$$\boxed{f'(x)=-\frac{9x}{\sqrt{(x^2-16)^3}}}$$

VISITA:
http://CursoDeCalculo.Wordpress.com
Profesor Raúl Vega Muñoz

SUSCRÍBETE AL CURSO GRATUITO DE CÁLCULO

COMPÁRTELO EN FACEBOOK