

DERIVADAS

(5)

FORMULAS DERIVACION

$$y = \operatorname{sen} u ; y' = u' \cdot \cos u$$

$$y = \cos u ; y' = -u' \cdot \operatorname{sen} u$$

$$y = \operatorname{tg} u ; y' = \frac{u'}{\cos^2 u}$$

$$y = \operatorname{cotg} u ; y' = \frac{-u'}{\operatorname{sen}^2 u}$$

$$y = \operatorname{sec} u ; y' = u' \cdot \operatorname{tg} u \cdot \operatorname{sec} u$$

$$y = \operatorname{cosec} u ; y' = -u' \operatorname{cotg} u \cdot \operatorname{cosec} u$$

EJEMPLOS

$$y = \operatorname{sen} (2x+3) ; y' = 2 \cdot \cos (2x+3)$$

$$y = \operatorname{sen} (x^2+1) ; y' = 2x \cdot \cos (x^2+1)$$

$$y = \cos \left(\frac{x+1}{x-1} \right) ; y' = - \left(\frac{x+1}{x-1} \right)' \cdot \operatorname{sen} \left(\frac{x+1}{x-1} \right)$$

$$y' = - \left[\frac{1 \cdot (x-1) - (x+1) \cdot 1}{(x-1)^2} \right] \cdot \operatorname{sen} \left(\frac{x+1}{x-1} \right)$$

$$y' = - \left[\frac{x-1-x-1}{(x-1)^2} \right] = \frac{-2}{(x-1)^2} \cdot \operatorname{sen} \left(\frac{x+1}{x-1} \right)$$

$$y = \operatorname{tg} \sqrt{x} \quad y' = \frac{\frac{1}{2} \cdot x^{-1/2}}{\cos^2 \sqrt{x}} = \frac{1}{2 \sqrt{x} \cdot \cos^2 \sqrt{x}}$$

$$y = \operatorname{cotg} (3x-1)^4 ; y' = \frac{-4 \cdot (3x-1)^3 \cdot 3}{\operatorname{sen}^2 (3x-1)^4} = \frac{-12(3x-1)^3}{\operatorname{sen}^2 (3x-1)^4}$$

$$y = \operatorname{sec} (3x^2+5) ; y' = 6x \cdot \operatorname{tg} (3x^2+5) \cdot \operatorname{sec} (3x^2+5)$$

$$y = \operatorname{cosec} (2x-1) ; y' = -2 \cdot \operatorname{cotg} (2x-1) \cdot \operatorname{cosec} (2x-1)$$

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¡Cuidado en algunos casos! Fijate en la diferencia entre los dos 1^{er} ejercicios

$$y = \text{sen}^2 x = \frac{u}{u^n} (\text{sen } x)^2$$

$$y' = n \cdot u^{n-1} \cdot \text{sen } x \cdot \cos x$$

$$y = \text{sen } x^2$$

$$y' = u' \cdot \cos u = 2x \cdot \cos x^2$$

Ejercicios:

$$y = 2 \cos x + \cos 2x$$

$$y = \frac{3}{\text{tg}^2 x}$$

$$y = 4 \cdot \cos^5(2x-1)$$

$$y = x \cdot \cos 2x$$

$$y = \text{cotg } 4x^2$$

$$y = \sec^4 x$$

$$y = \frac{\text{sen } x + \cos x}{\text{sen } x - \cos x}$$

MAS DERIVADAS TRIGONOM.

Deriva:

$$y = \cos^2 x^2$$

$$y = \operatorname{sen} \left(\frac{x+1}{x-1} \right)$$

$$y = \sqrt{\operatorname{tg} 3x}$$

$$y = \operatorname{sen} (\cos x).$$

$$y = \operatorname{sen} x \cdot \cos x$$

$$y = \operatorname{sec} \sqrt{5x}$$

$$y = \sqrt{\operatorname{sen} 3x}$$

$$y = \operatorname{tg} \sqrt{x}$$