

## EXAMEN DE CÁLCULO.

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Fecha / Date: \_\_\_\_\_

$$1. y = \frac{2x^3}{(3x+9)}$$

Formula:

$$\frac{d}{dx} \left( \frac{U}{V} \right) = \frac{(2x^3) \frac{d}{dx} (3x+9) - (3x+9) \frac{d}{dx} (2x^3)}{(3x+9)^2}$$

$$= \frac{(2x^3)(3) - (3x+9)(2(3)x^{3-1})}{(3x+9)^2}$$

$$= \frac{(6x^3) - (3x+9)6x^2}{3x+9}$$

$$= \frac{6x^3 - 18x^3 - 54x^2}{3x+9}$$

$$= \frac{-12x^3 - 54x^2}{3x+9}$$

$$2. y = \frac{4x^3}{\cos 2x^2} \quad \text{Formula: } \frac{d}{dx} \left( \frac{U}{V} \right)$$

$$= \frac{(\cos 2x^2)(12x^2) - (4x^3)(-4x \cdot \sin 2x^2)}{(\cos 2x^2)^2}$$

$$= \frac{12x^2 \cos 2x^2 + 4x^3 \cdot 4x \cdot \sin 2x^2}{(\cos 2x^2)^2}$$



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$$3.- y = \text{Sen } 2x^2 \cdot \text{Cos } 2x^2$$

Formula:

$$\frac{d}{dx} (U \cdot V) = U dv + V du$$

$$= (\text{Sen } 2x^2) (-4x \text{ Sen } 2x^2) + (\text{Cos } 2x^2) (4x \text{ Cos } 2x^2)$$

$$= -4x \text{ Sen}^2(2x^2) + 4x \text{ Cos}^2 2x^2$$

$$= 4x \text{ Cos}^2(2x^2) - 4x \text{ Sen}^2(2x^2)$$

$$1.- y = \frac{x+2}{\tan x}$$

Formula:

$$\frac{d}{dx} \left( \frac{U}{V} \right) = \frac{U dv - V du}{V^2}$$

$$= \frac{(\tan x) (1) - (x+2) (\text{Sec}^2 x)}{(\tan x)^2}$$

$$= \frac{\tan x - \text{Sec}^2 x (x+2)}{(\tan x)^2}$$



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$$5.- y = \sin(a-bx)$$

Fórmula:

$$\frac{d}{dx} (\sin u) = \cos u \cdot \frac{du}{dx}$$

$$= \frac{d}{dx} = -b \cos(a-bx)$$

$$6.- y = \sec \frac{2x^2}{(x^2+4)} = \text{Fórmula: } \frac{d}{dx} \left( \frac{u}{v} \right) = \frac{v du - u dv}{v^2}$$

$$= \frac{(x^2+4) (2x \sec 2x^2 \cdot \tan 2x^2) - (\sec 2x^2) (2x)^2}{(x^2+4)^2}$$

$$= \frac{4x(x^2+4) \sec(2x^2) \tan(2x^2) - 2x \sec(2x^2)^2}{(x^2+4)^2}$$



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$$7. - y = (1 + 2x)^2 \quad \text{Formula} = \frac{d}{dx} (u^n) = n u^{n-1} \cdot \frac{du}{dx}$$

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

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

$$8. - y = \frac{2-x}{x-2} \quad \text{Formula} = \frac{d}{dx} \left( \frac{u}{v} \right) = \frac{u \frac{dv}{dx} - v \frac{du}{dx}}{v^2}$$

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

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