

Nombre del alumno: Sinaí Elizabeth López Nájera

INSTRUCCIONES: Resuelve de forma clara y correcta las siguientes derivadas, aplicando las fórmulas correctas.

NOTA: LOS NÚMEROS DESPUÉS DE LAS VARIABLES SON EXPONENTES

1.- $Y = 2x^3 / (3x + 9)$

The image shows a handwritten solution on grid paper for the derivative of $Y = 2x^3 / (3x + 9)$. At the top, the quotient rule formula is written: $\frac{v}{u} = \frac{v'u - v' u'}{u^2}$. Below this, the derivative is calculated as follows:

$$1. \quad y = \frac{2x^3}{3x+9} = \frac{6x^2(3x+9) - 3(3x^3)}{(3x+9)^2} = \frac{18x^3 + 54x^2 - 9x^3}{(3x+9)^2}$$
$$= \frac{9x^3 + 54x^2}{(3x+9)^2} = \frac{6x^2(2x+9)}{(3x+9)^2}$$

2.- $Y = 4x^3 / \cos 2x^2$

The image shows a handwritten solution on grid paper for the derivative of $Y = 4x^3 / \cos 2x^2$. The calculation is as follows:

$$2. \quad y = \frac{4x^3}{\cos 2x^2}$$
$$= \frac{12x^2(\cos 2x^2) - [(-\sin 2x^2) 4x](-4x^2)}{(\cos 2x^2)^2}$$
$$= \frac{12x^2(\cos 2x^2) + 16x^3 \sin 2x^2}{(\cos 2x^2)^2}$$
$$= \frac{12x^2(\cos(2x^2)) + 16x^3 \sin(2x^2)}{(\cos 2x^2)^2}$$

3.- $Y = \sin 2x^2 \cos 2x^2$

3. $y = \text{Sen } 2x^2 \cos 2x^2 = \text{Usando } 2 \text{ sen}(t) \cos(t) = \text{Sen}(2t)$

$$y' = \frac{1}{2} \cdot 2 \text{ Sen}(2x^2) \cos(2x^2) = \text{Sen } 2x^2 \cos 2x^2$$

$$y' = \text{Sen } 4x^2 \Rightarrow \frac{d}{dx} (a \cdot f) = a \cdot \frac{d(f)}{dx} \Rightarrow y' = \frac{1}{2} \frac{d}{dx} (\text{Sen } 4x^2)$$

Usando regla de la cadena $\Rightarrow \frac{d}{dx} (f \cdot g) = \frac{d}{dx} (f(y)) \cdot \frac{d}{dx} (g)$

$$y' = \frac{1}{2} \frac{d}{dx} (\text{Sen}(g)) \cdot \frac{d}{dx} (4x^2) \quad g = 4x^2$$

$$y' = \frac{1}{2} \cos(g) \cdot 8x$$

$$y' = \frac{1}{2} \cos(4x^2) \cdot 8x$$

$$y' = 4x \cos(4x^2)$$

4. $Y = X + 2 / \tan x$

$$4. Y = x + 2 / \tan x = \frac{(1)(\tan x) - (\text{Sen}^2 x)(x + 2)}{(\tan x)^2}$$

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

$$= \frac{\text{Sen} x}{\cos x} + \frac{-x - 2}{\cos x^2} = \frac{(\frac{\text{Sen} x}{\cos x})^2}{\cos x^2} - \frac{x + 2}{\cos x^2}$$

$$= \frac{\text{Sen} x \text{ Sen} x - x - 2}{\text{Sen} x^2}$$

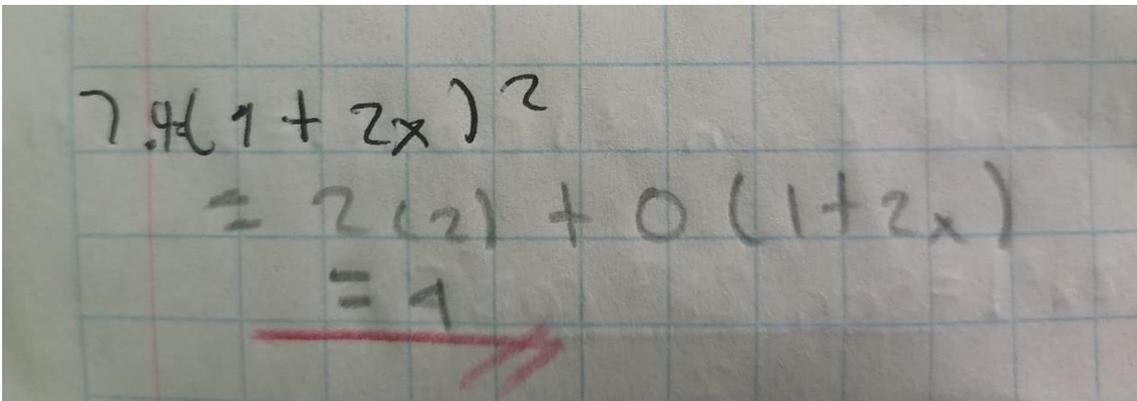
5. $Y = \text{sen}(a - bx)$

$$5. Y = \text{Sen}(a - bx)$$

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

$$6.- Y = \sec 2x^2 / (x^2 + 4)$$

$$7.- Y = (1 + 2x)^2$$



Handwritten calculation on grid paper:

$$\begin{aligned} 7. \frac{d}{dx} (1 + 2x)^2 \\ &= 2(2) + 0(1 + 2x) \\ &= 4 \end{aligned}$$

A red arrow points to the right from the final result, 4.

$$8.- Y = 2 - x / x - 2$$