EXAMEN CALCULO
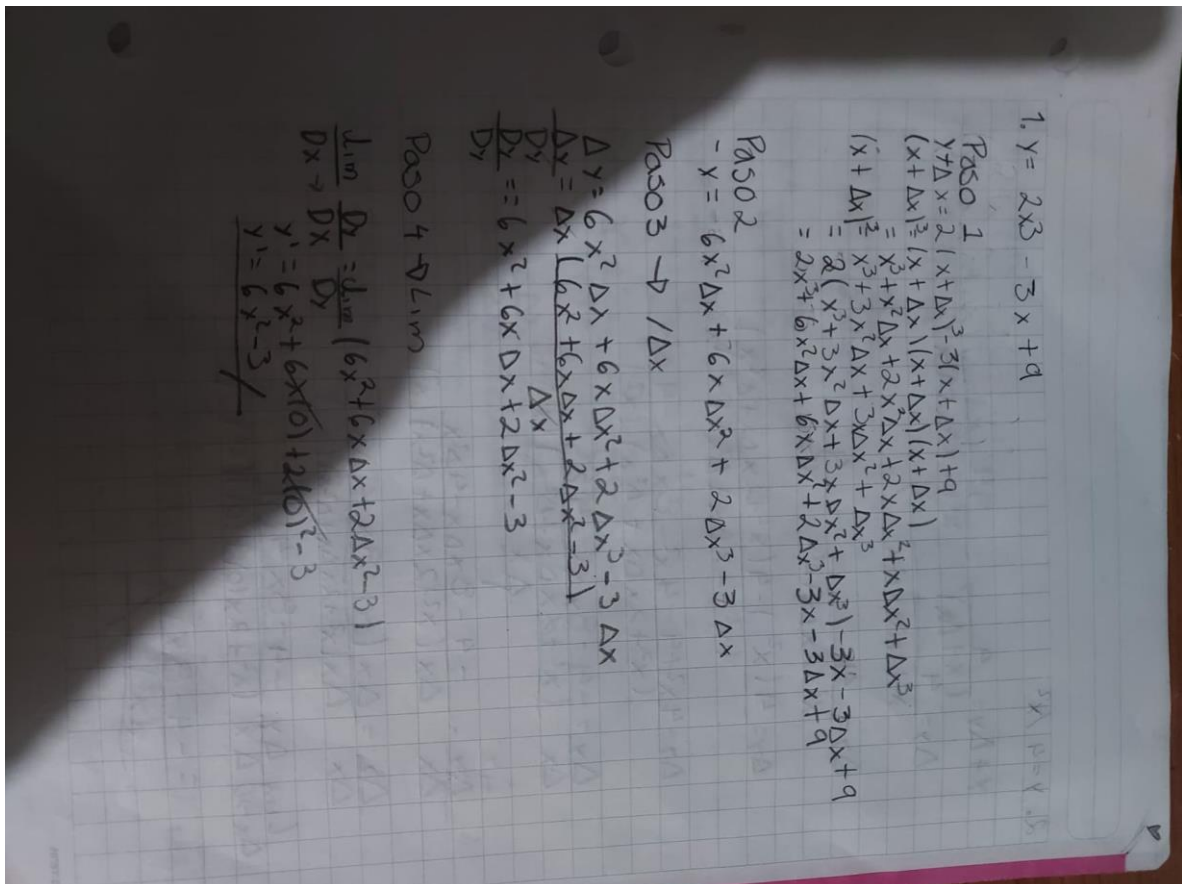
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INSTRUCCIONES: Resuelve de forma clara y correcta las siguientes derivadas, aplicando el método general (método de los cuatro pasos)

NOTA: LOS NUMEROS DESPUES DE LAS VARIABLES Y LOS PARENTESIS SON EXPONENTES

1.- $Y = 2X3 - 3X + 9$

2.- $Y = 4 / X2$

3.- $Y = 5 / 4 + X2$

4.- $Y = X + 2 / X$

5.- $Y = (a - bx)2$

6.- $Y = 2 / X2 + 4$

7.- $Y = (1 + 2X) 2$

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

2. $y = 4/x^2$

$y + \Delta y = \dfrac{4}{(x+\Delta x)^2} = \dfrac{4}{x^2 + 2x\Delta x + \Delta^2 x}$

$\Delta y = \dfrac{4}{x^2 + 2x\Delta x + \Delta^2 x} - y$

$\Delta y = \dfrac{4}{x^2 + 2x\Delta x + \Delta^2 x} - \dfrac{4}{x^2}$

$\Delta y = \dfrac{4(x^2) - 4(x^2 + 2x\Delta x + \Delta^2 x)}{(x^2 + 2x\Delta x + \Delta^2 x)(x^2)}$

$\Delta y = \dfrac{4x^2 + 4 - 4x^2 - 8x\Delta x - 4\Delta^2 x}{(x^2 + 2x\Delta x + \Delta^2 x)(x^2)}$

$\Delta y = \dfrac{-4 - 8x\Delta x - 4\Delta^2 x}{(x^2 + 2x\Delta x + \Delta^2 x)(x^2)}$

$\dfrac{\Delta y}{\Delta x} = \dfrac{\dfrac{-4 - 8x\Delta x - 4\Delta^2 x}{(x^2 + 2x\Delta x + \Delta^2 x)(x^2)}}{\Delta x}$

$\dfrac{\Delta y}{\Delta x} = \dfrac{-4 - 8x\Delta x - 4\Delta^2 x}{\Delta x(x^2 + 2x\Delta x + \Delta^2 x)(x^2)}$

$\dfrac{\Delta y}{\Delta x} = \dfrac{\Delta x(-4 - 8x - 4\Delta x)}{\Delta x(x^2 + 2x\Delta x + \Delta^2 x)(x^2)}$

$\lim_{\Delta x \to 0} \dfrac{\Delta y}{\Delta x} = \dfrac{-4 - 8x - 4(0)}{(x^2 + 2x(0) + (0)^2)(x^2)} = \dfrac{-4 - 8x}{(x^2)(x^2)}$

$= \dfrac{-4 - 8x}{(x^2)^2}$

3. $y = 5/4 + x^2$

$y + \Delta y = \dfrac{5}{4 + (x+\Delta)^2} = \dfrac{5}{4 + x^2 + 2x\Delta x + \Delta^2 x}$

$\Delta y = \dfrac{5}{4 + x^2 + 2x\Delta x + \Delta^2 x} - y$

$\Delta y = \dfrac{5}{4 + x^2 + 2x\Delta x + \Delta^2 x} - \dfrac{5}{4 + x^2}$

$\Delta y = \dfrac{5(4 + x^2) - 5(4 + x^2 + 2x\Delta x + \Delta^2 x)}{(4 + x^2 + 2x\Delta x + \Delta^2 x)(4 + x^2)}$

$\Delta y = \dfrac{20 + 5x^2 - 20 - 5x^2 - 10x\Delta x - 5\Delta^2 x}{(4 + x^2 + 2x\Delta x + \Delta^2 x)(4 + x^2)}$

$\Delta y = \dfrac{-10x\Delta x - 5\Delta^2 x}{\Delta x (4 + x^2 + 2x\Delta x + \Delta^2 x)(4 + x^2)}$

$\dfrac{\Delta y}{\Delta x} = \dfrac{-10x\Delta x - 5\Delta^2 x}{\Delta x(4 + x^2 + 2x\Delta x + \Delta^2 x)(4 + x^2)}$

$\dfrac{\Delta y}{\Delta x} = \dfrac{\Delta x (-10x - 5\Delta x)}{\Delta x(4 + x^2 + 2x\Delta x + \Delta^2 x)(4 + x^2)}$

$= \lim_{\Delta x \to 0} \dfrac{\Delta y}{\Delta x} = \dfrac{-10x - 5(0)}{(4 + 2x(0) + (0)^2)(4 + x^2)} = \dfrac{-10x}{(4 + x^2)(4 + x^2)}$

$= \dfrac{-10x}{(4 + x^2)^2}$