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Nombre del tema Derivadas

Parcial 3

Nombre de la Materia Cálculo

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Nombre de la Licenciatura BRH

Cuatrimestre 4

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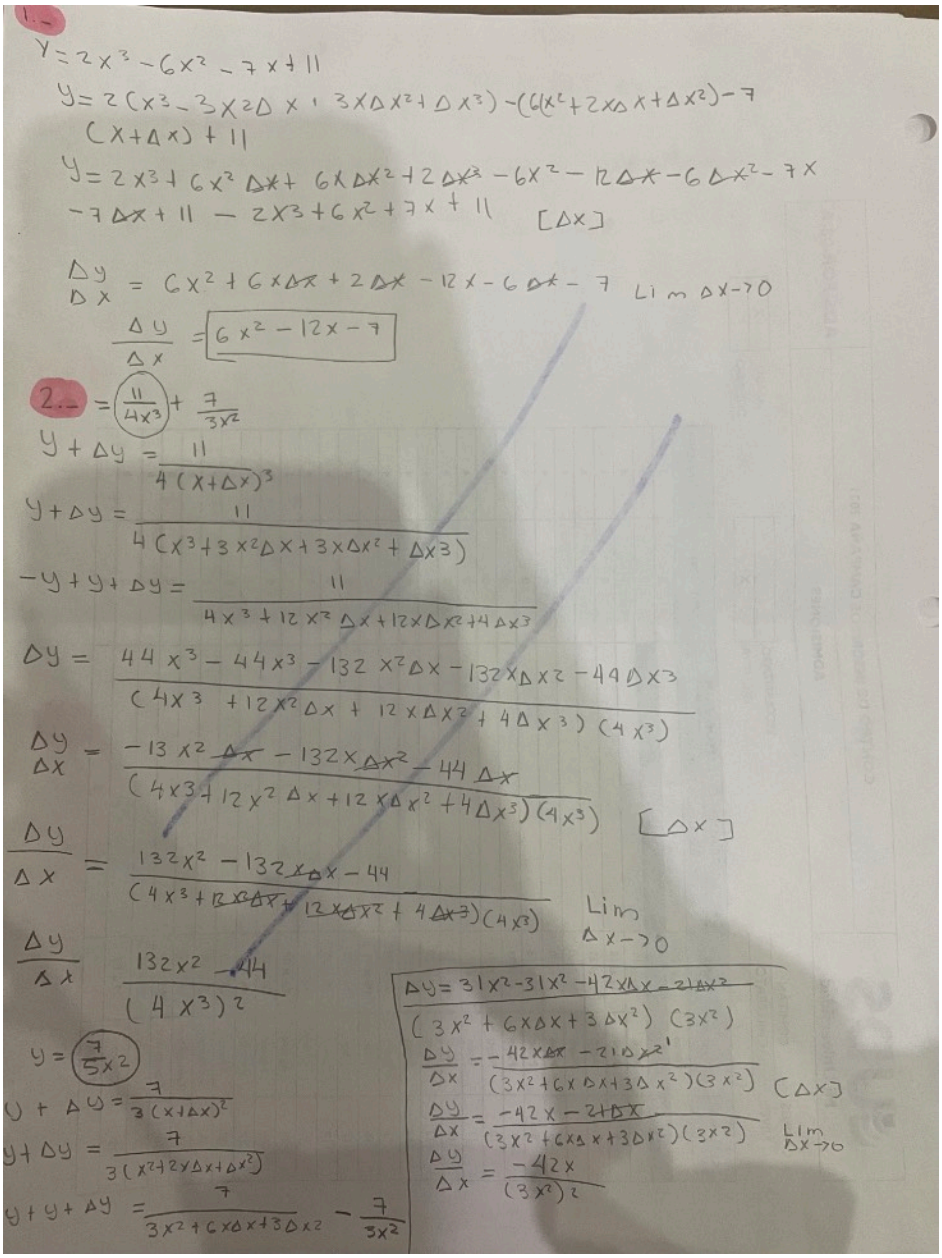
INTRODUCCIÓN

El siguiente trabajo esta basado sobre la unidad III, de los temas vistos en clase que quedaron comprendidos



1.-

$y = 2x^3 - 6x^2 - 7x + 11$

$y = 2(x^3 - 3x^2\Delta x + 3x\Delta x^2 + \Delta x^3) - (6x^2 + 2x\Delta x + \Delta x^2) - 7(x + \Delta x) + 11$

$y = 2x^3 + 6x^2\Delta x + 6x\Delta x^2 + 2\Delta x^3 - 6x^2 - 12\Delta x - 6\Delta x^2 - 7x - 7\Delta x + 11 - 2x^3 + 6x^2 + 7x + 11$ $[\Delta x]$

$\frac{\Delta y}{\Delta x} = 6x^2 + 6x\Delta x + 2\Delta x - 12x - 6\Delta x - 7$ $\lim \Delta x \to 0$

$\frac{\Delta y}{\Delta x} = \boxed{6x^2 - 12x - 7}$

2.-

$= \frac{11}{4x^3} + \frac{7}{3x^2}$

$y + \Delta y = \frac{11}{4(x+\Delta x)^3}$

$y + \Delta y = \frac{11}{4(x^3 + 3x^2\Delta x + 3x\Delta x^2 + \Delta x^3)}$

$-y + y + \Delta y = \frac{11}{4x^3 + 12x^2\Delta x + 12x\Delta x^2 + 4\Delta x^3}$

$\Delta y = \frac{44x^3 - 44x^3 - 132x^2\Delta x - 132x\Delta x^2 - 44\Delta x^3}{(4x^3 + 12x^2\Delta x + 12x\Delta x^2 + 4\Delta x^3)(4x^3)}$

$\frac{\Delta y}{\Delta x} = \frac{-132x^2\Delta x - 132x\Delta x^2 - 44\Delta x}{(4x^3 + 12x^2\Delta x + 12x\Delta x^2 + 4\Delta x^3)(4x^3)}$ $[\Delta x]$

$\frac{\Delta y}{\Delta x} = \frac{132x^2 - 132x\Delta x - 44}{(4x^3 + 12x\Delta x + 12x\Delta x^2 + 4\Delta x^3)(4x^3)}$ $\lim \Delta x \to 0$

$\frac{\Delta y}{\Delta x} \quad \frac{132x^2 - 44}{(4x^3)^2}$

$y = \frac{7}{5x^2}$

$y + \Delta y = \frac{7}{3(x+\Delta x)^2}$

$y + \Delta y = \frac{7}{3(x^2 + 2x\Delta x + \Delta x^2)}$

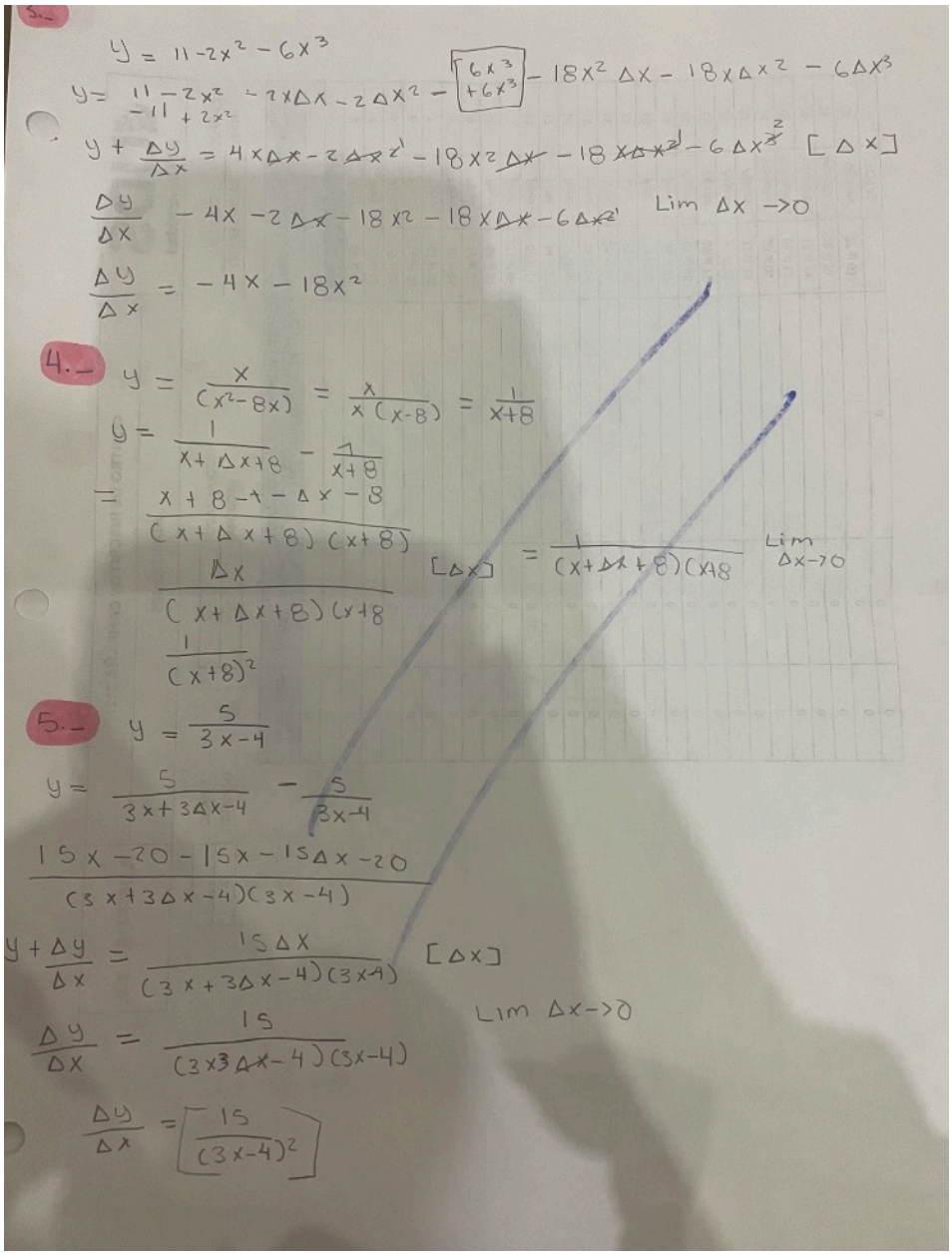
$y + y + \Delta y = \frac{7}{3x^2 + 6x\Delta x + 3\Delta x^2} - \frac{7}{3x^2}$

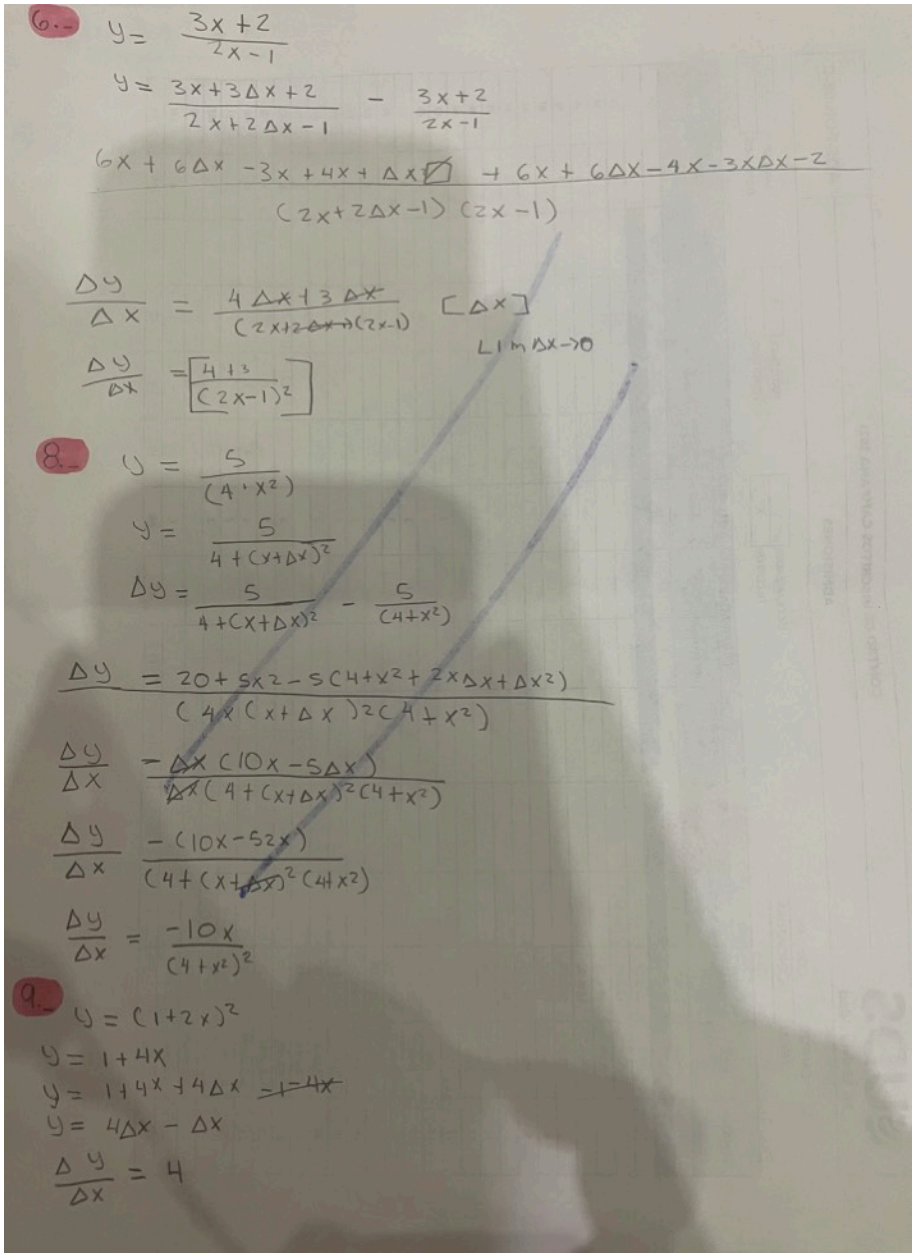
$\Delta y = \frac{31x^2 - 31x^2 - 42x\Delta x - 21\Delta x^2}{(3x^2 + 6x\Delta x + 3\Delta x^2)(3x^2)}$

$\frac{\Delta y}{\Delta x} = \frac{-42x\Delta x - 21\Delta x^2}{(3x^2 + 6x\Delta x + 3\Delta x^2)(3x^2)}$ $[\Delta x]$

$\frac{\Delta y}{\Delta x} = \frac{-42x - 21\Delta x}{(3x^2 + 6x\Delta x + 3\Delta x^2)(3x^2)}$ $\lim \Delta x \to 0$

$\frac{\Delta y}{\Delta x} = \frac{-42x}{(3x^2)^2}$


3.-
$y = 11 - 2x^2 - 6x^3$
$y = 11 - 2x^2 - 4x\Delta x - 2\Delta x^2 - 6x^3 - 18x^2\Delta x - 18x\Delta x^2 - 6\Delta x^3$
$-11 + 2x^2 + 6x^3$
$y + \frac{\Delta y}{\Delta x} = -4x\Delta x - 2\Delta x^2 - 18x^2\Delta x - 18x\Delta x^2 - 6\Delta x^3$ [Δx]
$\frac{\Delta y}{\Delta x} = -4x - 2\Delta x - 18x^2 - 18x\Delta x - 6\Delta x^2$ Lim $\Delta x \to 0$
$\frac{\Delta y}{\Delta x} = -4x - 18x^2$
4.-
$y = \frac{x}{(x^2 - 8x)} = \frac{x}{x(x-8)} = \frac{1}{x+8}$
$y = \frac{1}{x + \Delta x + 8} - \frac{1}{x+8}$
$= \frac{x + 8 - x - \Delta x - 8}{(x + \Delta x + 8)(x+8)}$
$\frac{\Delta x}{(x + \Delta x + 8)(x+8)}$ [Δx] $= \frac{1}{(x+\Delta x+8)(x+8)}$ Lim $\Delta x \to 0$
$\frac{1}{(x+8)^2}$
5.-
$y = \frac{5}{3x-4}$
$y = \frac{5}{3x + 3\Delta x - 4} - \frac{5}{3x-4}$
$\frac{15x - 20 - 15x - 15\Delta x - 20}{(3x + 3\Delta x - 4)(3x - 4)}$
$y + \frac{\Delta y}{\Delta x} = \frac{15\Delta x}{(3x + 3\Delta x - 4)(3x-4)}$ [Δx]
Lim $\Delta x \to 0$
$\frac{\Delta y}{\Delta x} = \frac{15}{(3x3\Delta x - 4)(3x-4)}$
$\frac{\Delta y}{\Delta x} = \frac{15}{(3x-4)^2}$



6.- $y = \frac{3x+2}{2x-1}$

$y = \frac{3x+3\Delta x+2}{2x+2\Delta x-1} - \frac{3x+2}{2x-1}$

$\frac{6x+6\Delta x-3x+4x+\Delta x}{(2x+2\Delta x-1)(2x-1)} + \frac{6x+6\Delta x-4x-3x\Delta x-2}{(2x+2\Delta x-1)(2x-1)}$

$\frac{\Delta y}{\Delta x} = \frac{4\Delta x+3\Delta x}{(2x+2\Delta x-1)(2x-1)}$ $[\Delta x]$

$\lim \Delta x \to 0$

$\frac{\Delta y}{\Delta x} = \left[\frac{4+3}{(2x-1)^2}\right]$

8.- $y = \frac{5}{(4+x^2)}$

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

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

$\frac{\Delta y}{\Delta x} = \frac{20+5x2-5(4+x^2+2x\Delta x+\Delta x^2)}{(4x(x+\Delta x)2(4+x^2)}$

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

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

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

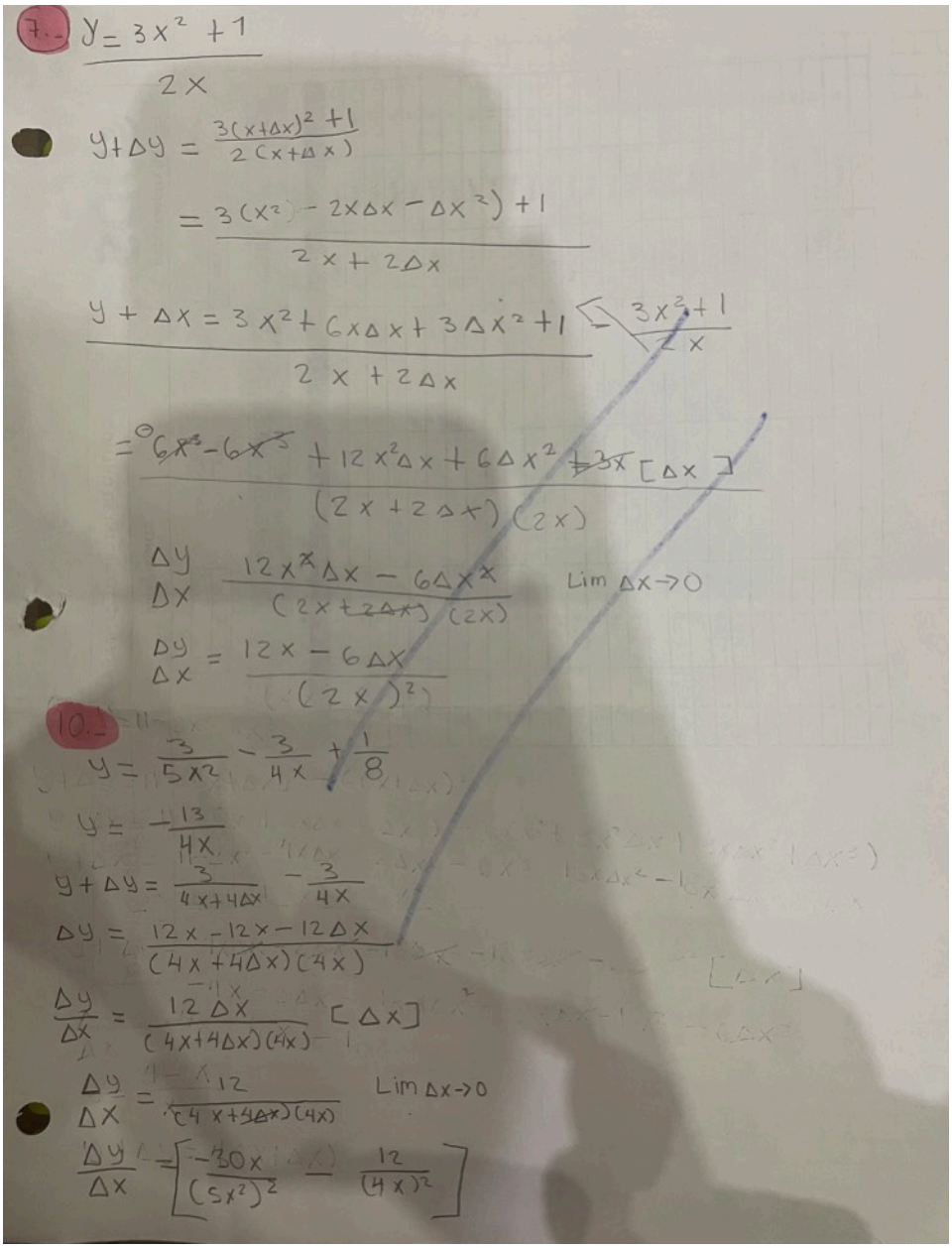
9.- $y = (1+2x)^2$

$y = 1+4x$

$y = 1+4x+4\Delta x$

$y = 4\Delta x - \Delta x$

$\frac{\Delta y}{\Delta x} = 4$


7.- $y = \frac{3x^2+1}{2x}$
$y+\Delta y = \frac{3(x+\Delta x)^2+1}{2(x+\Delta x)}$
$= \frac{3(x^2 - 2x\Delta x - \Delta x^2)+1}{2x+2\Delta x}$
$y+\Delta x = \frac{3x^2+6x\Delta x+3\Delta x^2+1}{2x+2\Delta x} - \frac{3x^2+1}{2x}$
$= \frac{6x^3-6x^3+12x^2\Delta x+6\Delta x^2-3x[\Delta x]}{(2x+2\Delta x)(2x)}$
$\frac{\Delta y}{\Delta x} \quad \frac{12x^2\Delta x - 6\Delta x^2}{(2x+2\Delta x)(2x)}$ Lim $\Delta x \to 0$
$\frac{\Delta y}{\Delta x} = \frac{12x-6\Delta x}{(2x)^2}$
10.-
$y = \frac{3}{5x^2} - \frac{3}{4x} + \frac{1}{8}$
$y = -\frac{13}{4x}$
$y+\Delta y = \frac{3}{4x+4\Delta x} - \frac{3}{4x}$
$\Delta y = \frac{12x-12x-12\Delta x}{(4x+4\Delta x)(4x)}$
$\frac{\Delta y}{\Delta x} = \frac{12\Delta x}{(4x+4\Delta x)(4x)}[\Delta x]$
$\frac{\Delta y}{\Delta x} = \frac{12}{(4x+4\Delta x)(4x)}$ Lim $\Delta x \to 0$
$\frac{\Delta y}{\Delta x} = \left[\frac{-30x}{(5x^2)^2} - \frac{12}{(4x)^2}\right]$

Fuentes de consulta : Antología de ecología UDS, Apuntes de clase y mi tema de exposición de Redes tróficas