

Calculo, Itzel Ralee

①

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

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

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

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

$$\frac{\Delta y}{\Delta x} = \frac{6x^2 \Delta x + 6x \Delta x^2 + 2\Delta x^3 - 12x\Delta x - 6\Delta x^2 - 7\Delta x}{\Delta x} = 6x^2 + 6x\Delta x + 2\Delta x^2 - 12x - 6\Delta x - 7$$

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

②

Profe los palitos cafes son las fracciones o bueno el sobre...

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

$$y + \Delta y = \frac{11}{4}(x + \Delta x)^3 + \frac{7}{3}(x + \Delta x)^2$$

$$y + \Delta y = \frac{11}{4}(x^3 + 3x^2\Delta x + 3x\Delta x^2 + \Delta x^3) + \frac{7}{3}(x^2 + 2x\Delta x + \Delta x^2)$$

$$y + \Delta y = \frac{11}{4}x^3 + \frac{33}{4}x^2\Delta x + \frac{33}{4}x\Delta x^2 + \frac{11}{4}\Delta x^3 + \frac{7}{3}x^2 + \frac{14}{3}x\Delta x + \frac{7}{3}\Delta x^2$$

$$\Delta y = \frac{33}{4}x^2\Delta x + \frac{33}{4}x\Delta x^2 + \frac{11}{4}\Delta x^3 + \frac{14}{3}x\Delta x + \frac{7}{3}\Delta x^2$$

$$\frac{\Delta y}{\Delta x} = \frac{33}{4}x^2 + \frac{33}{4}x\Delta x + \frac{11}{4}\Delta x^2 + \frac{14}{3}x + \frac{7}{3}\Delta x$$

$$\lim_{\Delta x \rightarrow 0} \frac{\Delta y}{\Delta x} = \frac{33}{4}x^2 + \frac{14}{3}x$$

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

$$\frac{\Delta y}{\Delta x} = \frac{-132x^2 - 44}{(4x^3)^2} = \frac{-42x}{(3x^2)^2}$$

3

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

$$y + \Delta y = \left[\begin{array}{c} 11 \\ -2x^2 \\ -11 \\ +2x^2 \end{array} \right] - 4x\Delta x - 2\Delta x^2 + \left[\begin{array}{c} -6x^3 \\ +6x^3 \end{array} \right] - 18x^2\Delta x - 18x\Delta x^2 - 6\Delta x^3$$

$$y + \frac{\Delta y}{\Delta x} = -4x\Delta x - 2\Delta x^2 - 18x^2\Delta x - 18x\Delta x^2 - 6\Delta x^3 \div \Delta x$$

$$\frac{\Delta y}{\Delta x} = -4x - 2\Delta x - 18x^2 - 18x\Delta x - 6\Delta x^2 \quad \lim_{\Delta x \rightarrow 0}$$

$$\frac{\Delta y}{\Delta x} = -4x - 18x^2$$

4

$$y = \frac{x}{x^2 - 8x} = \frac{x}{x(x-8)} = \frac{1}{x-8}$$

$$y = \frac{1}{(x + \Delta x) + 8}$$

$$y = \frac{1}{x + \Delta x + 8} - \frac{1}{x + 8}$$

$$= \frac{x + 8 - x - \Delta x - 8}{(x + \Delta x + 8)(x + 8)}$$

$$= \frac{-\Delta x}{(x + \Delta x + 8)(x + 8)} \div \Delta x = \frac{1}{(x + \Delta x + 8)(x + 8)} \quad \lim_{\Delta x \rightarrow 0}$$

$$\frac{1}{(x + 8)^2}$$

5

$$y = \frac{5}{3x - 4}$$

$$y = \frac{5}{3x + 3\Delta x - 4} - \frac{5}{3x - 4}$$

$$\frac{15\Delta x - 20 + 15x + 15\Delta x - 20}{(3x + 3\Delta x - 4)(3x - 4)}$$

$$y + \frac{\Delta y}{\Delta x} = \frac{15\Delta x}{(3x + 3\Delta x - 4)(3x - 4)} \div \Delta x$$

$$\frac{\Delta y}{\Delta x} = \frac{15}{(3x + 3\Delta x - 4)(3x - 4)} \quad \lim_{\Delta x \rightarrow 0}$$

$$\frac{\Delta y}{\Delta x} = \frac{15}{(3x - 4)^2}$$

6

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

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

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

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

$$\frac{\Delta y}{\Delta x} = \frac{4+3}{(2x+2\Delta x-1)(2x-1)} \quad \lim_{\Delta x \rightarrow 0}$$

$$\frac{\Delta y}{\Delta x} = \frac{7}{(2x-1)^2}$$

7

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

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

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

$$\Delta y = \frac{6x^3 + 12x^2\Delta x + 6x\Delta x^2 + 4x - 6x^3 - 6x^2\Delta x - 4x - 4\Delta x}{(2x+2\Delta x)(2x)}$$

$$\frac{\Delta y}{\Delta x} = \frac{12x^2\Delta x + 6x\Delta x^2 - 6x^2\Delta x - 4\Delta x}{(2x+2\Delta x)(2x)} \div \Delta x$$

$$\frac{\Delta y}{\Delta x} = \frac{12x^2 + 6x\Delta x - 6x^2 - 4}{(2x+2\Delta x)(2x)}$$

$$\frac{\Delta y}{\Delta x} = \frac{12x^2 - 6x^2 - 4}{(2x)^2}$$

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

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

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

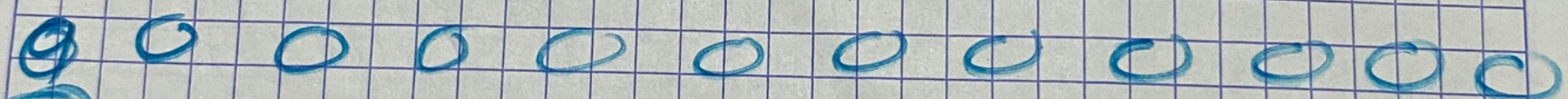
$$\Delta y = \frac{20 + 5x^2 - 5(4+x^2+2x\Delta x+\Delta x^2)}{(4+(x+\Delta x)^2)(4+x^2)}$$

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

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

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

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



$$9 \quad y = (1+2x)^2$$

$$y = 1+4x$$

$$y = x + \cancel{4x} + 4\Delta x \quad \cancel{1} = 4$$

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

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

$$(10) \quad y = \frac{3}{4x^2} = \frac{3}{4x} + \frac{1}{8}$$

$$y = \frac{-3}{4x}$$

$$y + \Delta y = \frac{-3}{4x + 4\Delta x} - \frac{3}{4x}$$

$$\Delta y = \frac{-12x - 12x - 12\Delta x}{(4x + 4\Delta x)(4x)}$$

$$\frac{\Delta y}{\Delta x} = \frac{12\Delta x}{(4x + 4\Delta x)(4x)} \quad \div \Delta x$$

$$\frac{\Delta y}{\Delta x} = \frac{12}{(4x + 4\Delta x)(4x)} \quad \lim_{\Delta x \rightarrow 0}$$

$$\frac{\Delta y}{\Delta x} = \frac{12}{(4x)^2}$$