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PASIÓN POR EDUCAR

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$$\textcircled{2} \quad -y = \frac{4}{x^2}$$

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

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

$$\Delta y = \frac{4x^2 - (4x^2 + 8x\Delta x + 4\Delta x^2)}{x^4 + 2x^3\Delta x + \Delta x^2}$$

$$\Delta y = \frac{-8x\Delta x - 4\Delta x^2}{(x^4 + 2x^3\Delta x + x^2\Delta x^2)}$$

$$\frac{\Delta y}{\Delta x} = \frac{-8x\Delta x - 4\Delta x^2}{(x^4 + 2x^3\Delta x + x^2\Delta x^2)}$$

$$\lim_{\Delta x} \frac{\Delta y}{\Delta x} = 0$$

$$\frac{dy}{dx} = \frac{-8x}{x^4}$$

$$\frac{\Delta y}{\Delta x} = \frac{-8}{3}$$

$$\textcircled{3} \quad y = \frac{5}{y+x^2}$$

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

$$Dy = \frac{20 + 5x^2 - 20 + 5(x+\Delta x)^2}{16 + 4(1x + \Delta x^2 + 4x^2 + x^2(x+\Delta x)^2)}$$

$$\frac{Dy}{Dx} = \frac{10x}{16 + 8x^2 + 8x\Delta x + 4\Delta x^2 + x^4 + 2x^3\Delta x + \Delta x^4}$$

$$\lim_{Dx \rightarrow 0}$$

$$\boxed{\frac{Dy}{Dx} = \frac{10x}{16 + 8x^2 + x^4}}$$

$$\textcircled{4} \quad y = \frac{x+2}{x} = \frac{x}{x} + \frac{2}{x} = 1 + \frac{2}{x}$$

$$-y + y + Dy = \cancel{1} + \left(\frac{2}{x+\Delta x}\right) - \cancel{1} + \left(\frac{2}{x}\right)$$

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

$$\frac{Dy}{Dx} = \frac{-2\Delta x}{x^2 + x\Delta x} \quad (\Delta x)$$

$$\frac{Dy}{Dx} = \frac{-2}{x^2 + x\Delta x}$$

$$\boxed{\frac{Dy}{Dx} = \frac{-2}{x^2}}$$

$$\lim_{Dx \rightarrow 0}$$

$$\textcircled{5} \quad y = (a - bx)^2$$

$$\frac{y(a - bx)^2}{(a - bx)(a - bx)}$$

$$\frac{a^2 - abx - abx + b^2x^2}{a^2 - 2abx + b^2x^2}$$

$$\begin{aligned} y + Dy &= a^2 - 2ab(x + Dx) + b^2(x + Dx)^2 \\ \frac{y + Dy}{x} &= \frac{a^2}{x} - 2ab + 2abDx + \frac{b^2}{x} + xDx + b^2Dx^2 \\ &= \frac{a^2}{x} + 2abx \end{aligned}$$

$$\frac{Dy}{Dx} = \frac{2abDx}{Dx} + \frac{2abDx}{Dx} + \frac{b^2Dx^2}{Dx}$$

$$\frac{Dy}{Dx} = 2ab + 2b^2x + b^2Dx^2$$

$$\lim_{Dx \rightarrow 0} \left[\frac{Dy}{Dx} = 2ab + 2b^2x \right]$$

$$\textcircled{6} \quad y = \frac{2}{x^2+4} \quad 4 + Dy = \frac{2}{(x+Dx)^2} + 4$$

$$-4 + 4 + Dy = \frac{2}{x + 2x Dx + Dx^2 + 4} - \frac{2}{x^2 + 4}$$

$$= \frac{2x^2 + 8 - 2x^2 - 4xDx - 2x^2 - 8}{x^4 + 2x^3 Dx + x^2 Dx^2 + 4x^2 + 4x^2 + 8xDx + 4Dx^2 + 16}$$

$$Dy = \frac{-4xDx - 2Dx^2}{(x^4 + 2x^3 Dx + x^2 Dx^2 + 4x^2 + 4x^2 + 8xDx + 4Dx^2 + 16)}$$

$$\frac{Dy}{Dx} = \frac{-4x - 2Dx}{(x^4 + \cancel{2x^3 Dx} + \cancel{x^2 Dx^2} + 8x^2 + \cancel{8xDx} + \cancel{4Dx^2} + 16)}$$

$$\boxed{\frac{Dy}{Dx} = \frac{-4x}{x^4 + 8x^2 + 16}}$$

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$$z = y(1+2x)^2$$

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

$$\begin{array}{r} 1 + 2x \\ + 2x + 4x^2 \\ \hline 1 + 4x + 4x^2 \end{array}$$

$$y = (1 + 4x + 4x^2)$$

$$y + Dy = 1 + 4(x + Dx) + 9(x + Dx)^2$$

$$= 1 + 4x + 4Dy + 4(x^2 + 2xDx + Dx^2)$$

$$y + Dy = 1 + 4 + 4Dy + 4x^2 + 8xDx + 4Dx^2$$

$$- y \quad = -1 - 4x \quad \times \quad 19Dy$$

$$Dy = \frac{4Dx}{Dx} + \frac{8xDy}{Dx} + 9Dx^2$$

$$\frac{Dy}{Dx} = 4 + 8 - 8y + 9Dx$$

$$\boxed{\frac{Dy}{Dx} = 4 + 8y}$$

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$$y \frac{2-x}{x-2} \quad y+Dy = 2 - x \cdot Dy - \left(\frac{2-x}{x-2} \right)$$

$$Dy = -2x - 4 + x^2 + 2x \cdot Dy - 20x \cdot (2x - x^2 + 20x) - xDy \quad -4 - 14 \cdot 2x$$

$$x^2 - 2x + xDy - 2Dy - 2x \cdot 14$$

$$Dy = \frac{-4 - xDy - 20x \cdot Dy - 28x}{x^2 - 2x + xDy - 2Dy - 28x}$$

$$\frac{Dy}{Dx} = \frac{-8 - 12x \cdot x}{x^2 - 4x + xDy - 20x}$$

$$\frac{Dy}{Dx} = \frac{-10}{x^2 + Dx + 40x} = 20x$$

$$\boxed{\frac{Dy}{Dx} = \frac{2x}{x^2}}$$