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CALCULO - CLASES CON MIYAKO

REGLAS

REGLA - CADENA

SI $f(x) = x^n$ entonces $f'(x) = n \cdot x^{n-1}$

Ejm 1 = DERIVA $f(x) = x^5$

$$f'(x) = 5x^4$$

DERIVA $f(x) = 3x^7$

$$f'(x) = 21 x^6$$

REGLA - CONSTANTE

SI $f(x) = c$, DONDE c es constante, entonces $f'(x) = 0$

DERIVAR $f(x) = 7$ DERIVAR $f(x) = -3$

$$f'(x) = 0$$ $$f'(x) = 0$$

REGLA - SUMA

DERIVAR $f(x) = x^2 + 5x$ DERIVAR $f(x) = 4x^3 + x^3$

$$f'(x) = 2x + 5$$ $$f'(x) = 12x^2 + 2x$$

REGLA - PRODUCTO

SI $f(x) = g(x) \cdot h(x)$, entonces $f'(x) = g'(x) \cdot h(x) + g(x) \cdot h'(x)$

DERIVAR $f(x) = x^2 \cdot \sin(x)$

$$f'(x) = 2x \cdot \sin(x) + x^2 \cdot \cos(x)$$

DERIVAR $f(x) = (2x + 1) \cdot e^x$

$$f'(x) = 2 \cdot e^x + 2x e^x + e^x$$

$$f'(x) = 3e^x$$

$$f(x) = -x^2 \to y = f(x)$$

① $f' \, y \, f''$

$f'(x) = -2x \to ?$ "C" $= 0$

$f''(t) = -2$

② $f'(x) = 0 \to C = (x+y) \to \cdot C = (0,0) \; Max$

$-2 \cdot x = 0$

$x = \dfrac{0}{-2}$

$x = 0$

$f(0) = -(0)^2$

$f(0) = 0$

$y = 0$

③ $f''(x) = 0 \to P.I = 0$

$f''(x) > 0 \to P.\min = +$

$f''(x) < 0 \to P.\max = -$

$f''(x) = -2$

$f''(0) = \boxed{-2}$

$$f(x) = 2x^3 - 4x^2$$

① $f'(x) = 6x^2 - 3x$

$f''(x) = 12x - 8$

② $f'(x) = 0 \to 8 \to "C" \to C = \left(\dfrac{4}{3}, \dfrac{-64}{12}\right)$

$6x^2 - 3x = 0$

$x(6x-8) = 0 \to x = 0$

$6x - 8 = 0$

$6x = 8$

$x = \dfrac{8}{6} = \dfrac{4}{3}$

$f\left(\dfrac{4}{3}\right) = 2\left(\dfrac{4}{3}\right)^3 - 4\left(\dfrac{4}{3}\right)^2$

$f\left(\dfrac{4}{3}\right) = 2 \cdot \dfrac{64}{27} - 4 \cdot \dfrac{16}{9}$

$f\left(\dfrac{4}{3}\right) = \dfrac{128}{27} - \dfrac{64}{9} = \dfrac{-64}{27} = y$

AUX

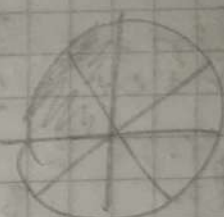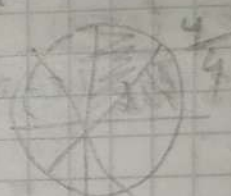$$x = \frac{-5 \pm \sqrt{5^2 - 4ac}}{2a}$$

¿FRACCIONES?

$$\frac{128}{21} - \frac{64}{9} \cdot \frac{3}{3}$$

$$\frac{128}{21} - \frac{192}{27} = \frac{64}{27}$$

$$\frac{1}{3} + \frac{1}{4} \cdot \frac{2}{2} = \frac{1}{8} + \frac{2}{8} = \frac{3}{8}$$

$$1 = \frac{4}{4}$$

$$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$$

$$\frac{1}{4} = \frac{2}{8}$$

$$\frac{1}{4} \cdot \frac{2}{2}$$

$$1 = \frac{8}{8}$$

$$\frac{3}{8}$$

$$\frac{4}{4}$$

$$\frac{2}{8}$$

$$\lim_{x \to 1} \frac{f(x)}{g(x)} = \frac{\ln x}{x - 1}$$

$$f(x) = \ln x \qquad g(x) = x - 1$$

$$f'(x) = \frac{1}{x} \quad \Rightarrow \quad g'(x) = 1$$

$$\lim_{x \to 1} \frac{f'(x) = \frac{1}{x}}{g'(x) = \frac{1}{1}} = \frac{1}{x}$$

$$\lim_{x \to 1} \frac{1}{x} \qquad \lim_{x \to 1} \frac{1}{(x)} = 1$$

$$f(x) = e^x$$

$$f'(x) = e^x$$

der

$$\lim_{x\to 0} \frac{\sin(3x)}{x \cdot \frac{3}{2}\sin 2x} = \frac{3}{6}$$

$f(x) = \sin(3x)$ $g(x) = x - \frac{3}{2}\cdot \sin(2x$

$f'(x) = 3 \cdot \cos(3x)$ $g'(x) = 1 - \frac{3}{2}\cdot 2 \cdot \cos(2x$
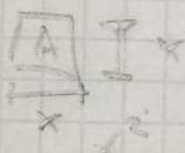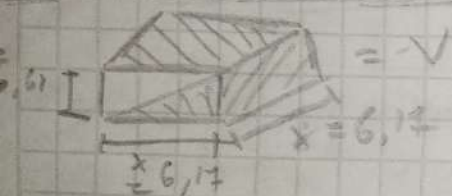
$$g'(x) = 1 - 3\cos(2x)$$

$$\lim_{x\to 0} \frac{3\cos(3x)}{1 - 3\cos(2x)}$$

$\ln(x)$

$\downarrow$

$\frac{1}{x}$

$$\lim_{x\to 0} = \frac{3\cos(3\cdot 0)}{1 - 3\cos(2\cdot 0)}$$

$$\lim_{x\to 0} \frac{3\cdot 1}{1 - 3\cdot 1} = \frac{3}{-2} = \boxed{-\frac{3}{2}}$$

$1 - 3$

$= V$

$x = 6,17$

$\frac{x}{=6,17}$

A $\uparrow x$

x x^2

$A = 2$
$V = 3$

$A \cup x$
$x^2 \cdot y = 252$

$y = \frac{252}{x^2}$

$V = 252 \, m^3 = y \cdot x \cdot x = V = x^2 \cdot y$

$F = \square = 5 \cdot x^2$

$T = \square = 2,3 \cdot x^2$

$L = \square = 3,5 \cdot 4 \cdot xy$

$f(x) = 5\cdot x^2 + 2,5 x^2 + 14 xy$

$f(x) = 7,5 x^2 + 14 \times \left(\frac{252}{x^2}\right)$

$f(x) = 7,5 x^2 + \frac{3528}{x}$

$f'(x) = 15x + \left(-\frac{3528}{x^2}\right)$

$\boxed{f'(x) = -\frac{3528}{x^2} + 15x}$

$$f(x) = 1.5x^2 + \frac{3523}{x}$$

$$f(6,17) = 1.5(6,17)^2 + \frac{3523}{(6,17)}$$

$$f(6,17) = 285,51 + 571,79$$

$$f(6,17) = 857,3$$

$$-\frac{3523}{x^2} + 15x = 0$$

$$-\frac{3523}{x^2} = -15x$$

$$-3523 = -15x \cdot x^2$$

$$-3523 = -15x^3$$

$$x^3 = \frac{3523}{15}$$

$$x^3 = \frac{1176}{5}$$

$$\sqrt[3]{x^2} = \sqrt[3]{\frac{1176}{5}}$$

$$\boxed{x = 6;17}$$

$$y = \frac{252}{x^2}$$

$$y = \frac{252}{(6,17)^2}$$

$$y = 6,61$$

AUX

$$b(x) = \frac{3523}{x^1}$$

$$b(x) = 3523 \cdot x^{-1 \cdots}$$

$$b'(x) = 3523 \cdot (-1) \cdot x^{-2}$$

$$b'(x) = -3523 \cdot x^{-2}$$

$$b'(x) = -\frac{3523}{x^2}$$