Derivada es un cambio

Siempre la derivada de una costante es 0

- Regla de la potencia

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

ejem 1 = Deriva $f(x)=x^5$ $\quad$ ejem 2 $f(x)=3x^7$

$f'(x)=5x^4$ $\quad$ $f'(x)=21x^6$

Regla de la costante

Si $f(x)=c$, donde c es una constante entonses $f'(x)=0$

ejem 1 deriva $f(x)=1$ $\quad$ $f(x)=-3$

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

Regla de la suma

Si $f(x)=g(x)+h(x)$ entonces $f'(x)=g'(x)+h'(x)$

ejem 1 = Deriva x^2+5x $\quad$ ejem 2 Deriva $f(x)=4x^3+x^2$

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

Regla del producto

Si $f(x)=g(x)\cdot h(x)$, entonses $f'(x)=g'(x)\cdot h(x)+g(x)\cdot h'(x)$

ejem 1 Deriva $f(x)=x^2 \cdot \sin(x)$

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

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

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

$f'(x)=2e^x+2xe^x+1e^x$

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

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Matimos y minimos

$F(x) = -x^2 \xrightarrow[2]{} y = f(x)$

1 f' y f''

$f'(x) = -2x \rightarrow$ puntos criticos "C" $= 0$ $C = (x, y) = C = (0)$

$f''(x) = -2$

2 $f'(x) = 0$ $\quad f(0) = -x^2$

$-2x = 0$ $\quad f(0) = 0$

$x = \frac{0}{-2}$ $\quad y = 0$

$x = 0$

3 $f''(x) = 0 \rightarrow p.I = 0$ $\quad f''(x) = -2$

$f''(x) = >0 \rightarrow p.\min = +$ $\quad f''(0) = -2$ Max

$f''(x) < 0 \rightarrow p.\max = -$

$f'(0) = 2(0)^3 - 4(0)^2$

$f'(0) = 0$

$f'(0) 12(0) - 8$

$f'(0) = -8$ Max

$\times \frac{16}{4}$ 2

64

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

$f'(x) = 6x^2 - 8x$

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

$f'(x) = 0 \rightarrow$ "C" $\rightarrow C = (\ ,\ )$

$6x^2 - 8x = 0$

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

$6x - 8 = 0$

$6x = +8$

$x = \frac{\cancel{8}^{4}}{\cancel{6}_{3}} = \frac{4}{3}$

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

$f''(\frac{4}{3}) = 12(\frac{4}{3}) - 8$

$f''(\frac{4}{3}) = \frac{48}{3} = \frac{4}{1} \cdot 8 = 16 - 8 = 8$ Min

$f(\frac{4}{3}) = 2(\frac{4}{3})^3 - 4(\frac{4}{3})^2$

$f(\frac{4}{3}) = 2\left(\frac{64}{27}\right) \ 4\left(\frac{16}{27}\right)$

$f(\frac{4}{3}) = \frac{128}{27} \ \frac{64}{27} = \frac{3}{3}$

$\frac{128}{24} \cdot \frac{192}{27} = 8 \quad \frac{-64}{24}$

$\frac{128}{24}$ $\quad \frac{64}{9}$ $\quad 4$ $\quad 8 \ 7 =$

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

[redacted]

$\frac{5}{3} - \frac{4}{7} =$ $\qquad$ $\frac{1}{9} + \frac{1}{2} =$

$\frac{1}{2} + \frac{3}{4} =$ $\qquad$ $\frac{3}{7} + \frac{1}{5} - \frac{10}{3}$

$\frac{5}{2} - \frac{2}{3} + \frac{3}{5} = \left(\frac{5}{2} \cdot \frac{15}{15}\right) - \left(\frac{2}{3} \cdot \frac{10}{10}\right) + \left(\frac{3}{5} \cdot \frac{6}{6}\right) = 1$

6 $\quad$ 30

$= \frac{15}{30} - \frac{20}{30} + \frac{18}{30} = \frac{13}{30}$

$\frac{128}{24} - \frac{64}{8} \cdot \frac{3}{3}$ $\qquad$ $1 = \frac{4}{4}$ $\qquad$ $1 = \frac{8}{8}$

$\frac{128}{24} - \frac{192}{24} = \frac{-64}{24}$ $\qquad$ $\frac{1}{4} + \frac{1}{4} = \frac{2}{4} \cdot \frac{1}{4} = \frac{2}{8}$ $\qquad$ $\frac{1}{8} + \frac{1}{4} \to \frac{1}{8}, \frac{1}{4}$.

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

$\frac{1}{4} \cdot \frac{2}{2}$ $\quad$ $\frac{2}{8}$ $\qquad$ $\frac{4}{4}$ $\qquad$ $\frac{8}{8}$

$\frac{2}{8}$

$$\lim_{x\to 1} = \frac{\ln x}{x-1} = \frac{0}{0}$$

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

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

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

$f(x) = e^x$

$f'(x)\, e^x$

$$\lim_{x\to} \frac{1}{x}$$

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

$$\lim_{x\to 0} = \frac{\operatorname{sen}(3x)}{x - \frac{3}{2}\operatorname{se}(2x)} = \frac{0}{0}$$

$f(x) = \operatorname{sen}(3x)$

$f'(x) = 3 \cdot \cos(3x)$

$g(x) = x - \frac{3}{2} \cdot \operatorname{sen}(2x)$

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

$g'(x) = 1 - 3\cos(2x)$

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

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

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

$1 - 3$

$g(x) = x - \frac{3}{2} \cdot \operatorname{sen}(2x)$

$$\lim_{x\to 0} \frac{\operatorname{sen}(3x)}{x - \frac{3}{2}\operatorname{sen}(2x)} = \frac{0}{0}$$

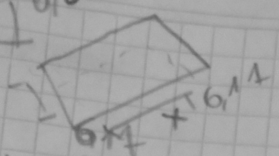
$g'(x)$ $1 - \frac{3}{2} \cdot 2 \cdot \cos(2x)$

$f'(x) = \operatorname{sen}(3x)$

$g'(x) = 3 \cdot \cos(3x)$

$g'(x) = 1 + 3\cos(2x)$

$x \perp 6{,}61$



$\triangle \; \perp \; x \qquad 4 = 2 \quad v = 3$

x

x^2

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

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

$T = \square = 2{,}5 \cdot x^2$

$L = \square = 3{,}5 \cdot 4 \cdot x \cdot y$

$1 \cdot 4 \cdot x$

$x^2 \cdot y = 252$

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

$F(x) = 5 \cdot x^2 + 2{,}5x^2 + 14x \cdot y$

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

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

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

$\frac{1}{a^n} = 1 \cdot a^{-n}$

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

$A \quad v$

$b(x) = \frac{3528}{x}$

$b(x) = 3528x^{-1}$

$b'(x) = 3528 \cdot (-1)$

$b'(x) = -3528 \cdot x^{-2}$

$-\frac{3528}{x^2} + 15x = 0$

$-\frac{3528}{x^2} = -15x$

$-3528 = -15x \cdot x^2$

$-3528 = -15x^3$

$x^3 = \frac{-3528}{-15}$

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

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

$x = 6{,}17$

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

$F'(6{,}17) = 7{,}5(6{,}17)^2 + \frac{3528}{6{,}17}$

$F(6{,}17) = 285{,}51 + 571{,}79$

$F'(6{,}17) = 857{,}3$

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

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

$y = 6{,}61$