Repaso: Reglas de la derivada

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Regla de la potencia

$F(x)=x^n \Rightarrow F'(x)=n\cdot x^{n-1}$

$F(x)=x^5 \Rightarrow F'(x)=5x^4$; $F(x)=3x^7 \Rightarrow 21x^6$

Regla del producto

$f(x)=g(x)\cdot h(x) \Rightarrow f'(x)=g'(x)\cdot h(x)+g(x)\cdot h'(x)$

$F(x)=x^2\cdot \operatorname{sen}(x) \Rightarrow F'(x)=2x\cdot\operatorname{sen}(x)+x^2\cdot\cos(x)=$

$F(x)=3x^7 \Rightarrow F'(x)=0\cdot x^7+3\cdot 7x^6=0+21x^6=21x^6$

$J(x)=(2x+1)\cdot e^x \Rightarrow f'(x)=2\cdot e^x+(2x+1)\cdot e^x \Rightarrow f'(x)=2e^x+2e^x x+e^x \Rightarrow f'(x)=3e^x+2xe^x$

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Cálculo: Mirgalko Verde

$f(x) = -x^2$

$f'(x) = -2y$

$f''(x) = -2$

$f'(x) = 0$ $\quad -2x = 0$ $\quad y = -x^2$ $\quad C = (0, 0)$ max

$x = \frac{0}{2}$ $\quad y = (0)^2$

$x = 0$ $\quad y = 0$

$f''(x) = 0 \rightarrow P.I = 0$

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

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

$f''(x) = 0$

$f''(0) = -2 \rightarrow$ [illegible]

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

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

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

$f'(x) = 0$ $\quad 6x^2 - 8 = 0$

$x(6x - 8) = 0$

$x_1 = 0$ $\quad 6x - 8 = 0$

$6x = 8$

$x = \frac{8^4}{6_3} = \frac{4}{3}$

Peñuela: Miyako

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

① $f'(x) = 6x^2 - 8x$

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

② $f'(x) = 0 \Rightarrow C \Rightarrow C\left(\frac{4}{3}, \frac{64}{27}\right)$

$6x^2 - 8x = 0$

$x(6x - 8) = 0$

$6x - 8 = 0$

$6x = 8$

$x = \frac{\cancel{8}^4}{\cancel{6}_3} = \frac{4}{3}$

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

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

$y = \frac{128}{27} - \frac{64}{9} = -\frac{64}{27}$

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

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

$f''\left(\frac{4}{3}\right) = \frac{\cancel{12}^4}{1} \cdot \frac{4}{\cancel{3}_1} - 8$

$f''\left(\frac{4}{3}\right) = 16 - 8 = \boxed{8}$ min

$C(0,0)$

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

$f''(0) = 12(0) - 8 = \boxed{-8}$ max

Refuerzo calculo: Miyako

Ravinél González Valencia

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

$f'(x) = \frac{1}{x}$ $\quad \lim_{x\to 1} \frac{\ln x}{x-1} = \lim_{x\to 0} \frac{\frac{1}{x}}{1} = \lim_{x\to 1} \frac{1}{x} = \frac{1}{1} = 1$

$g'(x) = 1$

$f(x) = e^x$

$f'(x) = e^x$

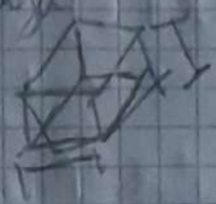
$\lim_{x\to 0} \frac{\operatorname{sen} 3x}{x - \frac{3}{2}\operatorname{sen} 2x} = \frac{0}{0}$

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

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

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

$f(x,y)$



$V = 252\ m^2$

$f = 5\cdot x^2$

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

$L = 3{,}5\cdot 4xy$

$A\ V_x$

$x^2 y = 252$

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

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

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

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

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

$F'(x) = -\frac{3528}{x^2} + 15x$ $\qquad x^3 = \frac{1176}{5}$

$-\frac{3528}{x^2} + 15x = 0$ $\qquad \sqrt[3]{x^3} = \sqrt[3]{\frac{1176}{5}}$

$-\frac{3528}{x^2} = -15x$ $\qquad x = 6{,}17$

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

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

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

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

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

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

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

$y = 6{,}61$