Derivación exponencial

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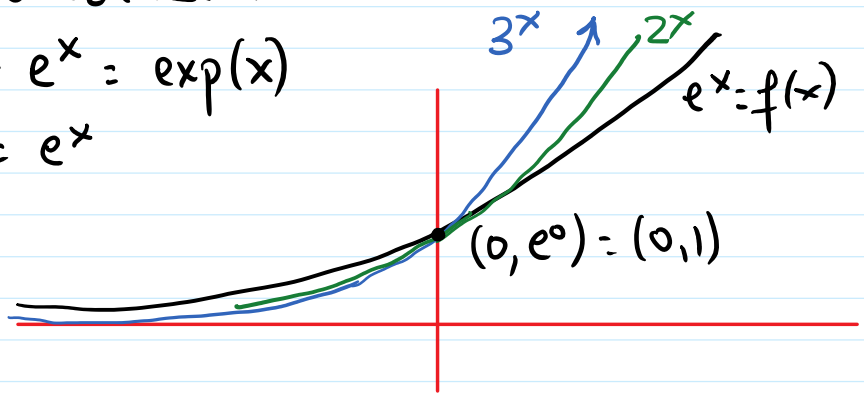
REGLAS DE DERIVACIÓN

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

$f'(x) = e^x$



$g(x) = 3^x \qquad g'(x) = 3^x \cdot \ln 3 = 1'098 \cdot 3^x$

$h(x) = 2^x \qquad h'(x) = 2^x \cdot \ln 2 = 0'693 \cdot 2^x$

$f(x) = e^{2x}$

$f'(x) = 2e^{2x}$

$e^x \xrightarrow{d} e^x$

$e^{2x} \longrightarrow 2e^{2x}$

$e^{5x} \xrightarrow{d} 5e^{5x}$

$f(x) = e^{5x}$

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

$f(x) = e^{\sqrt{2}x} \qquad f'(x) = \sqrt{2}\, e^{\sqrt{2}x}$

$f(x) = 2^{7x} \qquad f'(x) = 7 \cdot \ln 2\, 2^{7x} = \underbrace{7 \ln 2}_{7 \cdot 0'693} \cdot 2^{7x} = 4'85 \cdot 2^{7x}$

$f(x) = 3 \cdot 5^{8x} \qquad f'(x) = 3 \cdot \ln 5 \cdot 8 \cdot 5^{8x} = \boxed{24 \cdot \ln 5 \cdot 5^{8x}} = \ln 5^{24} \cdot 5^{8x}$

$24 \cdot \ln 5 = \ln 5^{24}$

REGLA $\quad k \cdot f(x) \xrightarrow{d} k \cdot f'(x)$

$x^2 \xrightarrow{d} 2x$

$8x^2 \longrightarrow 8 \cdot 2x = 16x$

$f(x) = \frac{1}{e^x}$ ⇝ (lociente) NO

$f(x) = e^{-1\cdot x}$ $\xrightarrow{d}$ $f'(x) = (-1)\ln e \cdot e^{-x} = -1\cdot e^{-x}$

$f(x) = e^{-x}$ $\quad f'(x) = -e^{-x}$

$f(x) = \frac{8}{2^{5x}} = 8\cdot 2^{-5x}$ (EXP.) $\quad f'(x) = 8\cdot(-5)\cdot 2^{-5x}\cdot \ln 2 =$

$= -40\cdot \ln 2 \cdot 2^{-5x} =$

$= \frac{-40\cdot \ln 2}{2^{5x}}$

NO $\quad \frac{8}{2^{5x}} = $ (NO) $\frac{8}{2\cdot^{5x}} = \frac{8}{2^{(5x)}}$ (no.)

$= \frac{8}{(2^{5x})}$

$f(x) = \frac{24}{3\cdot 5^x} = \frac{8}{5^x} = 8\cdot 5^{-x} \xrightarrow{d} f'(x) = 8\cdot 5^{-x}\ln 5(-1)$

$f'(x) = \frac{-8\ln 5}{5^x}$

$f(x) = e^{8x}$ deriver $8x \xrightarrow{d} 8$ $\quad f'(x) = 8\cdot e^{8x}$

$f(x) = e^{x^2}$ $\xrightarrow{d}$ $2x$ $\quad f'(x) = 2x\cdot e^{x^2}$

$f(x) = e^{7x+8}$ $\quad f'(x) = 7\cdot e^{7x+8}$ Derivar exponente

$7x+8 \xrightarrow{d} 7$

expr. de x

$f(x) = e^{x^2+7x}$ $\xrightarrow{d}$ $f'(x) = (2x+7)e^{x^2+7x} = (2x+7)e^{x^2+7x}$

$f(x) = e$ exponencial $\quad f'(x) = (2x+7)e \quad = (2x+7)e$

$x^2+7x \xrightarrow{d} 2x+7$

$f(x) = e^{5x^3} \quad f'(x) = e^{5x^3} \cdot 15x^2 = 15x^2 e^{5x^3}$

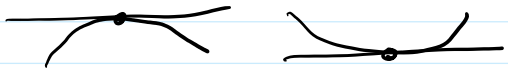
deriver

- $f(x) = e^{8x^2+7x-9} \quad f'(x) = 2^{8x^2+7x-9} \cdot \ln 2 \cdot (16x+7)$

derivar la

$f'(x) = \ln 2 \cdot (16x+7) \cdot 2^{8x^2+7x-9}$

ESTUDIAR SI TIENE MÁX/MÍNIMO



$f' = 0$

BUSCAR DONDE $f'(x) = 0$

EC $\rightarrow \ln 2 \cdot (16x+7) \cdot 2^{8x^2+7x-9} = 0$

$0'69 \quad (16x+7) \cdot 2^{8x^2+7x-9} = 0$

ó bien $16x+7 = 0 \Rightarrow x = \frac{-7}{16}$ ✓ Candidato

o bien $2^{8x^2+7x-9} = 0 \Rightarrow$ ∅ Imposible / no sol.

$= 0$ no tiene solución

$\frac{x^2+7x-5}{8\sqrt{x}-9x^3}$

$32608.4 \quad = 0$

no tiene solución

no tiene solución

¿Será un MAX/min?