(15) $y = \ln\sqrt{1-x}$

$y' = \frac{1}{\sqrt{1-x}} \frac{1}{2\sqrt{1-x}} \cdot (-1) = \frac{-1}{2-2x} = \frac{1}{2x-2}$

• $y = \frac{1}{2}\ln|1-x|$ $y' = \frac{1}{2}\frac{1}{1-x}(-1) = \frac{-1}{2-2x} = \frac{1}{2x-2}$

(16) $y = \log_3(7x+2)$

$y' = \frac{7}{(7x+2)\ln 3}$

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(17) $y = e^{4x}$

$y' = e^{4x} \cdot 4 = 4e^{4x}$

(18) $y = 2^x$

$y' = 2^x \ln 2$

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(19) $y = 5\,tg^3(3x^2+1)$

$y' = 5 \cdot 3\,tg^2(3x^2+1)\left[1+tg^2(3x^2+1)\right] \cdot 6x$

$90x \cdot tg^2(3x^2+1)\left[1+tg^2(3x^2+1)\right]$

20) $y = \sqrt{tg\,x^2}$

$y' = \frac{1}{2\sqrt{tg\,x^2}}(1+tg^2x^2)\,2x = \frac{x(1+tg^2x^2)}{\sqrt{tg\,x^2}}$

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15) $y = \sqrt[3]{3x^2} = \sqrt[3]{3}\,x^{2/3}$

$y' = \sqrt[3]{3}\,\frac{2}{3}x^{-1/3} = \frac{2}{3}\sqrt[3]{\frac{3}{x}}$

$y' = \frac{1}{3\sqrt[3]{(3x)^2}} \cdot 6x = \frac{2x}{x\sqrt[3]{3x}}$

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

$y' = \frac{0 \cdot x - 2 \cdot 1}{x^2} + \frac{1}{2} \cdot 2x$

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

36) $y = 7e^{-x}$

$y' = 7 \cdot e^{-x}(-1) = -7 \cdot e^{-x}$

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4 b) $y = \operatorname{sen} x \cos x$

$y' = \cos x \cos x + \operatorname{sen} x(-\operatorname{sen} x)$

$= \cos^2 x - \operatorname{sen}^2 x = \cos 2x$

5 b) $y = \ln(x^2+1)$

$y' = \dfrac{2x}{x^2+1}$

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① $f(x) = \begin{cases} x^2 & x < 2 \\ 3x-2 & x \geq 2 \end{cases}$ Estudiar derivabilidad

CONTINUIDAD

f cont en $\mathbb{R} - \{2\}$

En $x=2$

$\lim_{x\to 2} f(x) \begin{cases} \lim_{x\to 2^-} x^2 = 4 \\ \lim_{x\to 2^+} 3x-2 = 4 \end{cases}$ f cont en $x=2$

$f(2) = 6-2 = 4$

Sol: f cont en $\mathbb{R}$

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DERIVABILIDAD

$f'(x) = \begin{cases} 2x & x < 2 \\ 3 & x > 2 \end{cases}$

f derivable en $\mathbb{R} - \{2\}$

En $x=2$ $f'(2^-) = 4$, $f'(2^+) = 3$ ≠ No derivable en $x=2$

SOL f' deriv en $\mathbb{R} - \{2\}$

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$f(x) = \begin{cases} x^2 - 5x + m & x \leq 1 \\ -x^2 + nx & x > 1 \end{cases}$

Calcular "m" y "n" para f sea derivable en $\mathbb{R}$.

CONTINUIDAD

f cont en $\mathbb{R} - \{1\}$

En $x=1$

$\lim_{x\to 1} f(x) \begin{cases} \lim_{x\to 1^-} x^2 - 5x + m = -4 + m \\ \lim_{x\to 1^+} -x^2 + nx = -1 + n \end{cases}$

$f(1) = -4 + m$

$-4 + m = -1 + n$ $\boxed{m - n = 3}$

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DERIVABILIDAD

$$f'(x)=\begin{cases}2x-5 & x<1\\ -2x+n & x>1\end{cases}$$

f derv en $\mathbb{R}-\{1\}$

En $x=1$: $f'(1^-)=-3$, $f'(1^+)=-2+n$

$-3=-2+n$

$-1=n$

$$\begin{cases}m-n=3\\ n=-1\end{cases}$$

$n=-1$	$m=2$

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DERIVADA DE LA FUNCION IMPLÍCITA

$2y+2x+xy+3=0$

$2y+xy=-2x-3$

$y(2+x)=-2x-3$

$y=\frac{-2x-3}{2+x}$ $y'=\dots$

$2y^2+2xy+2y-4x+3=0$ $y=f(x)$

$x'=1$

$y'=y'$

$2.2y.y'+2[1y+xy']+2y'-4.1+0=0$

$4yy'+2y+2xy'+2y'-4=0$

$4yy'+2xy'+2y'=4-2y$

$y'(4y+2x+2)=4-2y$

$y'=\frac{4-2y}{4y+2x+2}$

$y'(x,y)=\dots$

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$\operatorname{sen}(x^2y)-y^2+x=2-\frac{\pi^2}{16}$

a) Hallar la derivada.

$\cos(x^2y).[2xy+x^2y']-2yy'+1=0$

b) Calcular en $(2,\pi/4)$

$\cos(4.\frac{\pi}{4})[2.2.\frac{\pi}{4}+4y']-2.\frac{\pi}{4}y'+1=0$

$-1[\pi+4y']-\frac{\pi}{2}y'+1=0$

$-\pi-4y'-\frac{\pi}{2}y'+1=0$

$-2\pi-8y'-\pi y'+2=0$

$8y'+\pi y'=2-2\pi$

$y'(8+\pi)=2-2\pi$

$y'=\frac{2-2\pi}{8+\pi}\dots-$

ene 22-13:36

DERIVADA DE LA FUNCION EXP-POT.

$y=f(x)^n$ $y'=n.f(x)^{n-1}.f'(x)$

$y=n^{f(x)}$ $y'=n^{f(x)}\ln(n).f'(x)$

$y=f(x)^{g(x)}$

$y=(\operatorname{sen}x)^{2x}$

$\ln y=\ln(\operatorname{sen}x)^{2x}$

$\ln y=2x.\ln(\operatorname{sen}x)$

$\frac{1}{y}y'=2.\ln(\operatorname{sen}x)+2x\frac{\cos x}{\operatorname{sen}x}$

$y'=y[2\ln(\operatorname{sen}x)+2x.\operatorname{ctg}x]$

$y'=(\operatorname{sen}x)^{2x}[\quad+\quad]$

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$y = x^{\operatorname{sen} x}$

$\ln y = \ln x^{\operatorname{sen} x}$

$\ln y = \operatorname{sen} x \cdot \ln x$

$\frac{1}{y} y' = \cos x \ln x + \operatorname{sen} x \frac{1}{x}$

$y' = y \left[\quad \right]$

$y' = x^{\operatorname{sen} x} \left[\cos x \ln x + \frac{\operatorname{sen} x}{x} \right]$

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22, 23 → 2° Columnas

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