

Lista 10

$$\textcircled{1} \frac{d}{dx} (x^2+1)^7$$

$$7(x^2+1)^6 \frac{d}{dx} (x^2+1)$$

$$7(x^2+1)^6 \cdot 2x$$

$$14x(x^2+1)^6$$

$$\textcircled{2} \frac{d}{dx} (\sqrt{x^2+1})$$

$$\frac{1}{2\sqrt{x^2+1}} \cdot \frac{d}{dx} (x^2+1)$$

$$\frac{1}{2\sqrt{x^2+1}} \cdot 2x$$

$$\frac{x}{\sqrt{x^2+1}}$$

$$\textcircled{3} \frac{d}{dx} (\sqrt{5x+2})$$

$$\frac{1}{2\sqrt{5x+2}} \cdot \frac{d}{dx} (5x+2)$$

$$\frac{1}{2\sqrt{5x+2}} \cdot 5$$

$$\frac{5}{2\sqrt{5x+2}}$$

$$\textcircled{4} \frac{d}{dx} (\sqrt{2x^2-x})$$

$$\frac{1}{2(\sqrt{2x^2-x})^{1/2}} \cdot \frac{d}{dx} (\sqrt{2x^2-x})$$

$$\frac{1}{2(\sqrt{2x^2-x})^{1/2}} \cdot \frac{4x-1}{2\sqrt{2x^2-x}}$$

$$\frac{4x-1}{4(2x^2-x)^{3/2}}$$

$$\textcircled{5} \frac{d}{dx} (2x+1)^3$$

$$3(2x+1)^2 \frac{d}{dx} (2x+1)$$

$$3(2x+1)^2 \cdot 2$$

$$6(4x^2+2x+1)$$

$$24x^2+24x+6$$

$$\textcircled{6} \frac{d}{dx} (\sqrt{7x+3})$$

$$\frac{1}{2\sqrt{7x+3}} \cdot \frac{d}{dx} (7x+3)$$

$$\frac{1}{2\sqrt{7x+3}} \cdot 7$$

$$\frac{7}{2\sqrt{7x+3}}$$

$$\textcircled{7} \frac{d}{dx} \left(\frac{x}{1-3x} \right)^5$$

$$5 \left(\frac{x}{1-3x} \right)^4 \frac{d}{dx} \left(\frac{x}{1-3x} \right)$$

$$5 \left(\frac{x}{1-3x} \right)^4 \cdot \frac{1}{(1-3x)^2}$$

$$\frac{5x^4}{(1-3x)^6}$$

$$\textcircled{8} \frac{d}{dx} (2x-7)^3$$

$$3(2x-7)^2 \frac{d}{dx} (2x-7)$$

$$3(2x-7)^2 \cdot 2$$

$$6(2x-7)^2$$

$$\textcircled{9} \frac{d}{dx} (25+x^2)^{-1/2}$$

$$-\frac{1}{2} (25+x^2)^{-3/2} \frac{d}{dx} (25+x^2)$$

$$-\frac{1}{2} (25+x^2)^{-3/2} \cdot 2x$$

$$-\frac{x}{(25+x^2)^{3/2}}$$

$$\textcircled{10} \frac{d}{dx} (3(9x-4)^9)$$

$$3 \frac{d}{dx} (9x-4)^9$$

$$3 \cdot 9(9x-4)^8 \frac{d}{dx} (9x-4)$$

$$27(9x-4)^8 \cdot 9$$

$$243(9x-4)^8$$

$a) 12^x$ $12^x \ln(12)$	$b) \left(\frac{2}{5}\right)^x$ $\left(\frac{2}{5}\right)^x \ln\left(\frac{2}{5}\right)$	$c) -4e^x$ $-4 \frac{d}{dx}(e^x)$ $-4e^x$	$d) (7 \times 10^x)$ $7 \frac{d}{dx}(10^x)$ $7 \times 10^x \ln(10)$
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$e) e^{(3x^2-4)}$ $e^{3x^2-4} \times \frac{d}{dx}(3x^2-4)$ $e^{3x^2-4} \times 6x$	$f) e^{(5x-3x^2)}$ $e^{(5x-3x^2)} \ln(2)$ $\frac{d}{dx}((5x-3x^2) \ln(2))$ $\ln(2) \times (5-6x)$
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$g) \frac{1}{3} \sqrt{6x}$ $\frac{1}{3} e^{\sqrt{6x} \ln(1)} \frac{d}{dx}(\sqrt{6x} \ln(1))$ $\frac{1}{3} \times 0$ 0	$h) e^{\frac{x}{x-1}}$ $\frac{d}{dx} \left(\frac{x}{x-1} \right)$ $\frac{x}{x-1} \times -\frac{1}{(x-1)^2}$ $-\frac{2}{(x-1)^2}$
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$i) 6e^{\sqrt{x}} = 6 \frac{d}{dx} e^{\sqrt{x}}$ $6 e^{\sqrt{x}} \frac{d}{dx}(\sqrt{x})$ $6 e^{\sqrt{x}} \times \frac{1}{2\sqrt{x}}$ $\frac{3e^{\sqrt{x}}}{\sqrt{x}}$	$j) 3^{2x^2+3x-1}$ $3^{2x^2+3x-1} \ln(3) \frac{d}{dx}(2x^2+3x-1)$ $\ln(3)(4x+3)$ $(3^{2x^2+3x-1} \ln(3)(4x+3))$
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$$a) \log_2(3x)$$

$$\frac{\ln 3x}{\ln 2} = \frac{1}{\ln 2} \frac{d}{dx}(3x)$$

$$\frac{1}{\ln 2} \times \frac{1}{3x} \frac{d}{dx}(3x) \rightarrow$$

$$\frac{1}{\ln(2) x}$$

$$c) \log_6 x$$

$$\frac{\ln x}{\ln 6} = \frac{1}{\ln 6} \frac{d}{dx}(x)$$

$$\frac{1}{\ln(6) x}$$

$$d) \log_4 5x$$

$$\frac{\ln 5x}{\ln 4} = \frac{1}{\ln 4} \frac{d}{dx}(5x)$$

$$\frac{1}{\ln(4) x}$$

$$b) \ln(x^2+1)$$

$$\frac{1}{x^2+1} \frac{d}{dx}(x^2+1)$$

$$\frac{2x}{x^2+1}$$

$$e) \ln(x^3-4)$$

$$\frac{1}{x^3-4} \frac{d}{dx}(x^3-4)$$

$$\frac{3x^2}{x^3-4}$$

$$f) \sqrt{\ln x}$$

$$\frac{1}{2\sqrt{\ln x}} \frac{d}{dx}(\ln(x))$$

$$\frac{1}{2\sqrt{\ln x} x}$$

$$g) \ln 12$$

$$\text{Constante } \rightarrow 0$$

$$h) \log_5(2x^3)$$

$$\frac{\ln 2x^3}{\ln 5} = \frac{1}{\ln 5} \frac{d}{dx}(\ln(2x^3))$$

$$\frac{1}{\ln 5} \times \frac{1}{2x^3} \frac{d}{dx}(2x^3) \rightarrow \frac{3}{\ln 5 x}$$

$$i) \log_3(x^2+3x+4)$$

$$\frac{\ln(x^2+3x+4)}{\ln 3} = \frac{1}{\ln 3} \frac{d}{dx}(x^2+3x+4)$$

$$\frac{2x+3}{(x^2+3x+4)\ln 3}$$

$$j) \log_{10}(x^3+1)$$

$$\frac{\ln(x^3+1)}{\ln 10} = \frac{1}{\ln 10} \frac{d}{dx}(x^3+1)$$

$$\frac{3x^2}{\ln 10 \times (x^3+1)}$$

$$k) \log_3(x^2-5)$$

$$\frac{\ln(x^2-5)}{\ln 3} = \frac{1}{\ln 3} \frac{d}{dx}(x^2-5)$$

$$\frac{2x}{\ln 3 (x^2-5)}$$