A

MATEMATIKA II **Deribadak**

IZEN ABIZENAK:...

Hurrengo funtzioen deribatua kalkulatu eta laburtu:

$$y = Ln\sqrt[3]{\frac{x^2\cdot sinx}{e}} = \ln\left(\frac{x^2\cdot \sin x}{e}\right)^{1/3} = \frac{1}{3}\ln\left(\frac{x^2\cdot \sin x}{e}\right) =$$

$$= \frac{1}{3}\left[\ln(x^2\cdot \sin x) - \ln e\right] = \frac{1}{3}\left[\ln x^2 + \ln \sin x - \ln e\right]$$

$$= \frac{1}{3}\left[2\ln x + \ln \sin x - \underbrace{\cancel{\ln e}}_{1}\right] =$$

$$y' = \frac{1}{3}\left[\frac{2}{x} + \frac{1}{\sin x}\cos x\right] = \frac{2}{3x} + \frac{1}{3tgx}$$

atzean katearen erregelagot

$$y = \frac{x^2\cdot\sqrt[3]{x^2}}{2\cdot\sqrt[5]{x}} = \frac{x^2\cdot x^{2/3}\cdot x^{-1/5}}{2} = \frac{1}{2}\cdot x^{2+\frac{2}{3}-\frac{1}{5}} = \frac{1}{2}x^{\frac{30+10-3}{15}}$$

$$= \frac{1}{2}x^{37/15}$$

$$y' = \frac{1}{2}\cdot\frac{37}{15}\cdot x^{37/15-1} = \frac{37}{30}\cdot x^{22/15} = \frac{37}{30}\sqrt[15]{x^{22}} =$$

$$= \boxed{\frac{37}{30}\,x\sqrt[15]{x^7}}$$

$$y = e^{-2x}\cdot arctg(x^2+3x)$$

$$f'g + fg'$$

$$y' = -2\cdot e^{-2x}(arctg(x^2+3x)) + e^{-2x}\cdot\frac{1}{1+(x^2+3x)^2}\cdot 2x+3$$

$$= y' = e^{-2x}\left(-2arctg(x^2+3x) + \frac{2x+3}{1+(x^2+3x)^2}\right).$$

$$\rightarrow \frac{1}{e}\cdot(x^2 \sin x)$$

$$y = \ln \sqrt[3]{\frac{x^2\cdot \sin x}{e}}$$

$$-2/3$$

$$y' = \frac{1}{\sqrt[3]{\frac{x^2\cdot\sin x}{e}}}\cdot \underbrace{\frac{1}{3}\left(\frac{x^2\cdot\sin x}{e}\right)^{\frac{1}{3}-1}}_{\text{erroaren deribatua}}\cdot \underbrace{\frac{1}{e}\cdot(2x\sin x + x^2\cos x)}_{\text{biderketaren deribatua}}$$

$$y' = \frac{1}{3}\quad \frac{1}{\frac{x^2\cdot\sin x}{\cancel{e}}}\cdot\frac{1}{\cancel{e}}\,(2x\sin x + x^2\cos x)$$

$$y' = \frac{2x\sin x + x^2\cos x}{3x^2\sin x} =$$

$$= \frac{2}{3x} + \frac{1}{3\,\mathrm{tg}\,x}$$

$$y = \frac{x^2\cdot\sqrt[3]{x^2}}{2\sqrt[5]{x}} \rightarrow y' = \frac{\left(2x\sqrt[3]{x^2} + x^2\cdot\frac{3}{2}\,x^{\frac{2}{3}-1}\right)\cdot 2\sqrt[5]{x} - 2\frac{1}{5}x^{\frac{1}{5}-1}\cdot x^2\sqrt[3]{x^2}}{(2\sqrt[5]{x})^2}$$

MATÈMATIKA II **Deribadak**

IZEN ABIZENAK:..

Hurrengo funtzioen deribatua kalkulatu eta laburtu:

$$y = Ln\sqrt[5]{\frac{e\cdot cosx}{x^3}} = \frac{1}{5}\ln\left(\frac{e\cdot\cos x}{x^3}\right) = \frac{1}{5}\left[\ln(e\cdot\cos x) - \ln x^3\right] =$$

$$= \frac{1}{5}\left(\underbrace{\ln e}_{1} + \ln\cos x - 3\ln x\right) = \frac{1}{5}\left(1 + \ln\cos x - 3\ln x\right)$$

$$y' = \frac{1}{5}\left(\frac{1}{\cos x}(-\sin x) - \frac{3}{x}\right) = \frac{1}{5}\left(-tg\,x - \frac{3}{x}\right) = \frac{-tg\,x}{5} - \frac{3}{5x}$$

$$y = \frac{x^3\cdot\sqrt[5]{x^2}}{2\cdot\sqrt[3]{x}} = \frac{x^3\,x^{2/5}\cdot x^{-1/3}}{2} = \frac{1}{2}\cdot x^{3+2/5-1/3} = \frac{1}{2}x^{\frac{45+6-5}{15}} = \frac{1}{2}x^{46/15}$$

$$y' = \frac{1}{2}\cdot\frac{46}{15}\cdot x^{46/15-1} = \frac{23}{15}\cdot x^{31/15} = \frac{23}{15}\sqrt[15]{x^{31}} =$$

$$= \frac{23}{15}x^{2}\sqrt{x}$$

$$y = cos^2(e^{-3x}) = \left[\cos(e^{-3x})\right]^2$$

$$y' = \underbrace{2\cdot\cos(e^{-3x})\cdot(-\sin(e^{-3x}))}\cdot(-3)\,e^{-3x}$$

$$y' = 3e^{-3x}\cdot\sin(2e^{-3x})$$

MATEMATIKA II **Deribadak**

IZEN ABIZENAK:..

Hurrengo funtzioen deribatua kalkulatu eta laburtu:

$$y = Ln\sqrt[4]{\frac{e^3\cdot(x+1)}{cosx}} = \frac{1}{4}\ln\left(\frac{e^3(x+1)}{\cos x}\right) = \frac{1}{4}\left(\ln e^3(x+1) - \ln \cos x\right) =$$

$$= \frac{1}{4}\left(\ln e^3 + \ln(x+1) - \ln\cos x\right) = \frac{1}{4}\left(3\cancel{\ln e}^{1} + \ln(x+1) - \ln\cos x\right)$$

$$= \frac{1}{4}\left(3 + \ln(x+1) - \ln\cos x\right)$$

$$y' = \frac{1}{4}\left(\frac{1}{x+1} - \frac{-\sin x}{\cos x}\right) = \frac{1}{4}\left(\frac{1}{x+1} + tg\, x\right)$$

atzean katearen erregelagatik !!

$$y = \frac{x^6\cdot\sqrt[5]{x^2}}{5\cdot\sqrt[2]{x}} = \frac{x^6\cdot x^{2/5}}{5\, x^{1/2}} = \frac{1}{5}x^{6+2/5-1/2} = \frac{1}{5}x^{\frac{60+4-5}{10}} = \frac{1}{5}x^{59/10}$$

$$y' = \frac{1}{5}\,\frac{59}{10}\,x^{\frac{59}{10}-1} = \frac{59}{50}x^{49/10} = \frac{59}{50}x^4\sqrt[10]{x^9}$$

$$y = e^{-x}\cdot arctg(3^x)$$

$$y' = -e^{-x}\cdot arctg(3^x) + e^{-x}\cdot\frac{1}{1+(3^x)^2}\cdot 3^x\ln 3$$

$$y' = e^{-x}\left(-arctg(3^x) + \frac{\ln 3\cdot 3^x}{1+3^{2x}}\right)$$

KONTUZ !!
e^3 ktea da

$$y = \ln \sqrt[4]{\frac{e^3(x+1)}{\cos x}}$$

$$y' = \frac{1}{\sqrt[4]{\frac{e^3(x+1)}{\cos x}}} \cdot \frac{1}{4}\left(\frac{e^3(x-1)}{\cos x}\right)^{\frac{1}{4}-1} \cdot \frac{e^3 \cdot \cos x - (-\sin x) e^3 (x+1)}{\cos^2 x} =$$

$$= \frac{1}{4} \cdot \frac{1}{\frac{\cancel{e^3}(x+1)}{\cancel{\cos x}}} \cdot \frac{\cancel{e^3}(\cos x + \sin x (x+1))}{\cancel{\cos^2 x}}$$

$$= \frac{1}{4(x+1)} \cdot \frac{\cos x + \sin x (x+1)}{\cos x} =$$

$$= \frac{1}{4(x+1)} \left(\frac{\cos x}{\cos x} + \frac{\sin x (x+1)}{\cos x} \right)$$

$$= \frac{1}{4(x+1)} \left(1 + \operatorname{tg} x \, (x+1) \right)$$

$$= \boxed{\frac{1}{4(x+1)} + \frac{\operatorname{tg} x}{4}}$$

MATEMATIKA II Deribadak

IZEN ABIZENAK:......................................

Hurrengo funtzioen deribatua kalkulatu eta laburtu:

$y = sin^2(e^{-5x})$

$$y' = \underbrace{2\sin(e^{-5x})\cdot\cos(e^{-5x})}\cdot(-5)\cdot e^{-5x}$$

$$y' = \sin(2\cdot e^{-5x})\cdot -5\cdot e^{-5x}$$

$$\boxed{y' = -5\cdot e^{-5x}\cdot \sin(2\cdot e^{-5x})}$$

$y = Ln\sqrt[3]{\frac{e^x\cdot cosx}{(x-2)}}$ $= \frac{1}{3}\left(\ln(e^x\cdot\cos x) - \ln(x-2)\right) =$

$$= \frac{1}{3}\left(\ln e^x + \ln\cos x - \ln(x-2)\right) =$$

$$= \frac{1}{3}\left(x\cancel{\ln e}^{\,1} + \ln\cos x - \ln(x-2)\right)$$

$$y' = \frac{1}{3}\left(1 + \frac{-\sin x}{\cos x} - \frac{1}{x-2}\right) = \frac{1}{3}\left(1 - tg\,x - \frac{1}{x-2}\right)$$

$y = \frac{5\cdot x^6\cdot\sqrt[5]{x^3}}{2\cdot\sqrt[3]{x}}$ $= \frac{5}{2}\cdot x^{6+3/5-1/3} = \frac{5}{2}\cdot x^{\frac{90+9-5}{15}} = \frac{5}{2}\cdot x^{94/15}$

$$y' = \frac{5}{2}\cdot\frac{94}{15}\cdot x^{\frac{94}{15}-1} = \frac{47}{3}\cdot x^{79/15} = \frac{47}{3}\sqrt[15]{x^{79}}$$

$$\boxed{y' = \frac{47}{3}x^5\sqrt[15]{x^4}}$$