5/12/2019

424 $y = \ln^2 \sqrt{x^2+4} = \left(\ln \sqrt{x^2+4}\right)^2$

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

$$y' = 2\ln\sqrt{x^2+4} \cdot \left(\ln\sqrt{x^2+4}\right)' =$$

$$= 2\ln\sqrt{x^2+4} \cdot \frac{1}{\sqrt{x^2+4}} \cdot \left(\sqrt{x^2+4}\right)' =$$

$$= \cancel{2}\ln\sqrt{x^2+4} \cdot \frac{1}{\sqrt{x^2+4}} \cdot \frac{1}{\cancel{2}\sqrt{x^2+4}} \cdot 2x =$$

$$= \frac{2x \ln\sqrt{x^2+4}}{x^2+4}$$

425 $y = \dfrac{x\ln x - x + 1}{1 - x\ln x}$ $\left[y' = \dfrac{2\ln x - x + 1}{(1 - x\ln x)^2}\right]$

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

$$= \frac{(\ln x + \cancel{1} - \cancel{1})(1 - x\ln x) - (x\ln x - x + 1)(-\ln x - 1)}{(1 - x\ln x)^2} =$$

$$= \frac{\ln x - \cancel{x\ln^2 x} + \cancel{x\ln^2 x} + \cancel{x\ln x} - \cancel{x\ln x} - x + \ln x + 1}{(1 - x\ln x)^2}$$

$$= \frac{2\ln x - x + 1}{(1 - x\ln x)^2}$$

569 $y = \arctan \sqrt{x^2 - 1}$ $\left[y' = \dfrac{1}{x\sqrt{x^2-1}} \right]$

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

626 $y = \sqrt{\dfrac{1-\sin x}{1+\sin x}}$ $\left[y' = -\dfrac{\cos x}{|\cos x|(1+\sin x)} \right]$

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

$$= \frac{\sqrt{1+\sin x} \cdot [-\cos x - \cancel{\cos x \sin x} - \cos x + \cancel{\cos x \sin x}]}{2\sqrt{1-\sin x} \cdot (1+\sin x)^2} =$$

$$= \frac{-\cancel{2}\cos x \cdot \sqrt{1+\sin x}}{\cancel{2}\sqrt{1-\sin x} \cdot (1+\sin x)^2} \cdot \frac{\sqrt{1-\sin x}}{\sqrt{1-\sin x}} =$$

$$= \frac{-\cos x \sqrt{1-\sin^2 x}}{(1-\sin x)(1+\sin x)^2} = \frac{-\cos x \cdot \sqrt{\cos^2 x}}{(1-\sin x)(1+\sin x)(1+\sin x)} =$$

$$= \frac{-\cos x \cdot |\cos x|}{(1-\sin^2 x)(1+\sin x)} = \frac{-\cancel{\cos x} \cdot |\cos x|}{\cos^{\cancel{2}} x \, (1+\sin x)} = -\frac{|\cos x|}{\cos x \, (1+\sin x)}$$

RICORDARE CHE $\dfrac{|a|}{a} = \dfrac{a}{|a|}$

605 $y = (2^x)^{x^2}$ $[y' = 3 \cdot 2^{x^3} x^2 \ln 2]$

$y = 2^{x \cdot x^2} = 2^{x^3}$ ← COMPOSTA 2^x x^3

$y' = 2^{x^3} \cdot \ln 2 \cdot 3x^2 = (3 \ln 2) x^2 \cdot 2^{x^3}$

453 $y = x^{\cos x}$ $\left[y' = x^{\cos x}\left(\frac{\cos x}{x} - \sin x \ln x\right)\right]$

$y = x^{\cos x} = e^{\ln x^{\cos x}} = e^{\cos x \cdot \ln x}$

$y' = \underbrace{e^{\cos x \cdot \ln x}}_{x^{\cos x}} \cdot (\cos x \cdot \ln x)' =$

$= x^{\cos x}\left(-\sin x \cdot \ln x + \frac{\cos x}{x}\right)$