ES N 201 PAG 58

$$D\left(\sqrt{\ln(x^2+4)}\right) = D\left(\left[\ln(x^2+4)\right]^{\frac{1}{2}}\right) =$$

$$= \frac{1}{2}\left[\ln(x^2+4)\right]^{\frac{1}{2}-1}\left[\ln(x^2+4)\right]' =$$

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

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

N. 207

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$$D\left(\ln\left(e^{x}+e^{-x}\right)\right) = \frac{1}{e^{x}+e^{-x}} \cdot \left(e^{x}+e^{-x}\right)' =$$

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

$$= \frac{1}{e^{x}+e^{-x}} \cdot \left(e^{x}-e^{-x}\right) = \frac{e^{x}-e^{-x}}{e^{x}+e^{-x}} = \operatorname{tgh} x$$

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$f(x) = x^2 + 3 \quad x_0 = 4$

$g(x) = \sqrt{x}$

1) insieme in cui sono derivabili

2) $g(f(x))$ in $x_0 = 4$

$D(x^2+3) = f'(x) = 2x + 0 = 2x$

$D(\sqrt{x}) = g'(x) = \frac{1}{2} x^{-\frac{1}{2}} = \frac{1}{2} \frac{1}{\sqrt{x}} = \frac{1}{2\sqrt{x}}$

$\begin{cases} D_{f'(x)} = R \\ D_{g'(x)} = (0;+\infty) \end{cases} \Rightarrow (0;+\infty)$

2) $h(x) = g(f(x)) = g(x^2+3) = \sqrt{(x^2+3)}$

$h'(x) = D(\sqrt{(x^2+3)}) = D\left((x^2+3)^{\frac{1}{2}}\right) =$

$= \frac{1}{2} (x^2+3)^{-\frac{1}{2}} D(x^2+3) =$

$2x =$

$= \frac{1}{\cancel{2}} \frac{1}{\sqrt{x^2+3}}$

$= \frac{x}{\sqrt{(x^2+3)}}$

$h'(x)\Big|_{x_0=4} = \frac{4}{\sqrt{19}}$

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$f(x) = x^3 - 3x^2$

$f'(x) = 3x^2 - 6x$

$f''(x) = 6x - 6$

$f'''(x) = 6 - 0 = 6$

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$y = 3e^x + 1$

$y' = 3e^x + 0$

$y'' = 3e^x$

$2y - y' - y'' = 2$

$2(3e^x + 1) - 3e^x - 3e^x = 2$

$\cancel{6e^x} + 2 - \cancel{6e^x} = 2$

$2 = 2$