1. $y=\sqrt[5]{\sin x^3}=\left(sen\ x^3\right)^{\frac{1}{5}}$ $\qquad y'=\frac{1}{5}\,3x^2\left(sen\,x^3\right)^{-\frac{4}{5}}\cos x^3$

x ----------------> x^3

t -------------> sen t

u --------------> $u^{\frac{1}{5}}$

2. y = ln (cos 2x + sen 3x) $\qquad y'=\frac{-2\,sen\,2x+3\cos 3x}{\cos 2x+sen\,3x}$

3. $y=7^{x^2}+2^{\sqrt{x}}$ = f(x) + g(x) $\qquad$ y ' = f '(x) + g '(x) =

$7^{x^2}\cdot 2\cdot ln7\cdot x+\frac{2^{\sqrt{x}}}{2\sqrt{x}}ln2$

$f=7^{x^2}$ $\qquad \ln f=x^2\cdot\ln 7$ $\qquad D(\ln f)=D(x^2\cdot\ln 7)$ $\qquad \frac{f'}{f}=2x\ln 7$

$f\,'=7^{x^2}\cdot 2\cdot ln7\cdot x$

$g=2^{\sqrt{x}}$ $\qquad \ln g=\sqrt{x}\ \ln 2$ $\qquad D(\ln g)=D(\sqrt{x}\ \ln 2)$ $\qquad \frac{g'}{g}=\frac{1}{2\sqrt{x}}ln2$

$g'=\frac{2^{\sqrt{x}}}{2\sqrt{x}}ln2$

4. $y=e^x\cdot\cos\sqrt{x}$ $\qquad y'=e^x\cos\sqrt{x}+e^x\,\frac{1}{2\sqrt{x}}\left(-sen\sqrt{x}\right)$

5. $y=tg\left(e^{x+4}\right)+\frac{1}{\sqrt{\cos x}}=tg\left(e^{x+4}\right)+(\cos x)^{-\frac{1}{2}}$

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

6. $y=\frac{\sqrt{2-x^2}}{x}$

$$y' = \frac{D\left(\sqrt{2-x^2}\right) \cdot x - 1 \cdot \sqrt{2-x^2}}{x^2} = \frac{\frac{-2x}{2\sqrt{2-x^2}} \cdot x - \sqrt{1-x^2}}{x^2} = \ldots\ldots$$

7. $y = \ln\sqrt{x^2+3x-4}$ $\qquad y' = \dfrac{2x+3}{2\sqrt{x^2+3x-4}}$

Data la funzione y = cos x + x^3

verificare che y''' + y'' + y' + y = x^3+ 3x^2 + 6x + 6

y = cos x + x^3 y ' = - sen x + 3 x^2 y '' = - cos x + 6 x y ''' = sen x + 6

sommando i cos x e i sen x si annullano e rimane il polinomio x^3 + 3 x^2 + 6x + 6