Es 431 PAG 80

$\sqrt{0,9994}$ $\qquad x_0 = 1$

$\Delta x = -0,0006$

$f(x) = \sqrt{x} \to f(x) = x^{\frac{1}{2}}$

$f'(x) = \frac{1}{2} x^{\frac{1}{2}-1} = \frac{1}{2} x^{-\frac{1}{2}} \to f'(x) = \frac{1}{2\sqrt{x}}$

$df = f(x) + f'(x)\Delta x \to df = f(1) - f'(1) \cdot 0,0006 =$

$= 0,9997$

Es 402 PAG 78

$f(x) = sen^2(2x) \qquad x_0 = \frac{\pi}{6} \qquad D\left(f^n(g(x))\right) =$

$f(x_0) = sen^2\left(\cancel{2}\frac{\pi}{\cancel{6}_3}\right) = sen^2\frac{\pi}{3} = \frac{3}{4}$

$f'(x) = \underbrace{4\, sen 2x \cdot cos 2x}_{2(2\, sen 2x\, cos 2x)} = 2\, sen 4x \qquad = n f^{n-1}(g(x))\, f'(g(x))\, g'(x)$

$f'(x_0) = f'\left(\frac{\pi}{6}\right) = 2\, sen \frac{4}{6}\pi = 2\, sen \frac{2}{3}\pi = 1,732$

$df(x) = f'(x_0)\Delta x = f'\left(\frac{\pi}{6}\right)\Delta x = \sqrt{3}\,\Delta x$

Es 403 PAG 78

$f : x \longrightarrow ln^2(sen x) \qquad x_0 = \frac{3}{4}\pi$

$f'(x) = 2\, ln(sen x)\left(\frac{1}{sen x}\right)(cos x) = 2\, ctg x\, ln(sen x)$

$f'(x_0) = f'\left(\frac{3}{4}\pi\right) = 2\, ctg\left(\frac{3}{4}\pi\right) ln\left(sen \frac{3}{4}\pi\right) =$

$= -2\, ln \frac{\sqrt{2}}{2} = -2\left(ln\sqrt{2} - ln 2\right) = -2\left(\frac{1}{2} ln 2 - ln 2\right) =$

$= -ln 2 + 2\, ln 2 = ln 2$

N 404

$f(x) = 2^{sen x} \qquad x_0 = 0 \qquad D\left(e^{f(x)}\right) = e^{f(x)} \cdot f'(x)$

$f(x) = e^{sen x\, ln 2} \qquad f'(x) = e^{sen x\, ln 2}\left(cos x\, ln 2\right)$

$f'(0) = 1\left(1\, ln 2\right) = ln 2$

N 4 PAG 143

$f(x) = |x^2 - 2x| \qquad I = [1-\sqrt{2}; 1+\sqrt{2}]$

È verificato in I Rolle?

$D_{f(x)} = \mathbb{R} \Rightarrow f(x)$ è continua in $\mathbb{R} \Rightarrow$
$f(x)$ è continua in I

$$f(x) = \begin{cases} x^2 - 2x & \text{per } x < 0 \lor x \geq 2 \\ -x^2 + 2x & 0 \leq x < 2 \end{cases}$$

$$f'(x) = \begin{cases} 2x - 2 & x < 0 \lor x \geq 2 \\ -2x + 2 & 0 \leq x < 2 \end{cases}$$

$$\left.\begin{array}{l} f'_-(0) = \lim_{x \to 0^-} (2x-2) = -2 \\ f'_+(0) = -2(0) + 2 = 2 \end{array}\right\} f(x) \text{ non è derivabile per } x = 0$$

$$\left.\begin{array}{l} f'_+(2) = 2(2) - 2 = 2 \\ f'_-(2) = \lim_{x \to 2^-} (-2x+2) = (-2)(2) + 2 = -2 \end{array}\right\}$$

f(x) non è derivabile per x = 2