n°35 p1697

$y = \sqrt{x^2-2x}$ $\quad [2;4]$

$y = \sqrt{\dots - x^2}$ CIRCONF
$- kx^2$ ELLISSE
$+ kx^2$ IPERB.

$\begin{cases} y \geq 0 \\ x^2-2x \geq 0 \\ y^2 = x^2-2x \end{cases}$

$y^2 - x^2 + 2x = 0$

$y^2 - x^2 + 2x + 1 - 1 = 0$

$y^2 - (x-1)^2 = -1$

$(x-1)^2 - y^2 = 1$

$f(x) = \sqrt{x^2-2x}$ C.E $x \leq 0 \vee x \geq 2$

· f DEF $[2;4]$

· f CONT $(2;4)$ $\quad \lim_{x \to x_0} f(x) = f(x_0)$

$f'(x) = \frac{1}{2\sqrt{x^2-2x}}(2x-2) = \frac{x-1}{\sqrt{x^2-2x}}$ $\quad \underline{x \neq 2} \longrightarrow$ Soddisfa LAGRANGE ?

$\exists c \in (2;4) \;/\; \frac{f(4)-f(2)}{4-2} = f'(c)$

$f'(c) = \frac{\sqrt{8}-0}{2}$ $\quad \sqrt{2} = f'(c)$

$$\sqrt{2} = \frac{x-1}{\sqrt{x^2-2x}} \rightarrow x-1 = \sqrt{2}\left(\sqrt{x^2-2x}\right)$$

$$x-1 = 2x^2-4x$$

$$x^2-2x-1=0 \quad x = 1 \pm \sqrt{2}$$

$1+\sqrt{2} \rightarrow c = 1+\sqrt{2}$

$1-\sqrt{2} \rightarrow$ NON ACCETTABILE

$$y = \sqrt{(1+\sqrt{2})^2-2(1+\sqrt{2})} = 1 \qquad P(1+\sqrt{2}\,;1) \; *$$

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Arco di IPERBOLE

$$f(x)\begin{cases}\dfrac{4}{x-2} & -2\le x<0\\ 4x^2-x-2 & 0\le x\le 1\end{cases}\qquad I=[-2;1]$$

$$\lim_{x\to 0^-} f(x)=\lim_{x\to 0^+} f(x)\to -2=-2$$ CONTINUA $f(0)=-2$

$f(x)$ è continua in $[-2;0)\cup(0;4]$ → N.B

$f(x)$ DERIVABILE in $(-2;0)\cup(0;1)$

$x=0\quad f'_-(0)=-4\left(\dfrac{1}{x^2-4x+4}\right)=-1$ DERIVABILE

$f'_+(0)=-1$

$$\exists\, c\in(-2;1)\,/\,\frac{f(1)-f(-2)}{1-(-2)}=f'(c)=2/3$$

$f'(c)\ [-2;0]:\ \dfrac{-4}{(x-2)^2}=2/3\to\emptyset$

$f'(c)\ [0;1]\ :\ 8x-1=2/3$

$x=5/24$

n°37

$$f(x) = \begin{cases} \sqrt{1-x} & -8 \le x < 0 \\ ax^2 + bx + 1 & 0 \le x \le 1 \end{cases}$$

CONTINUA

$f(x)$ continua in $[-8; 1]$

$f(x)$ continua $[-8; 0) \cup (0; 1] \rightarrow f(x)$ sono continue

$x = 0 \quad \lim_{x \to 0^-} = 1 = \lim_{x \to 0^+} \quad f(0) = 1$

DERIVABILE in $(-8; 1)$

$$f'(x) = \begin{cases} \dfrac{-1}{2\sqrt{1-x}} & -8 \le x < 0 \\ 2ax + b & 0 \le x \le 1 \end{cases}$$

$f'_-(0) = f'_+(0) \longrightarrow -\frac{1}{2} = b \qquad b = -\frac{1}{2}$

$f(-8) = f(1)$

$3 = a - \frac{1}{2} + 1 \quad a = \frac{5}{2} \qquad a = \frac{5}{2}$

1687-99 | 1702 → seguenti

* 76-78 p 1704