1/12/2020

77 $f(x) = \begin{cases} x-3 & \text{se } x \le 3 \\ \frac{1}{3}x - 1 & \text{se } x > 3 \end{cases}$, $\quad c = 3.$

Calcolare $f'_+(3)$ e $f'_-(3)$

$f(3) = 3 - 3 = 0$

$$f'_+(3) = \lim_{h \to 0^+} \frac{f(3+h) - f(3)}{h} =$$

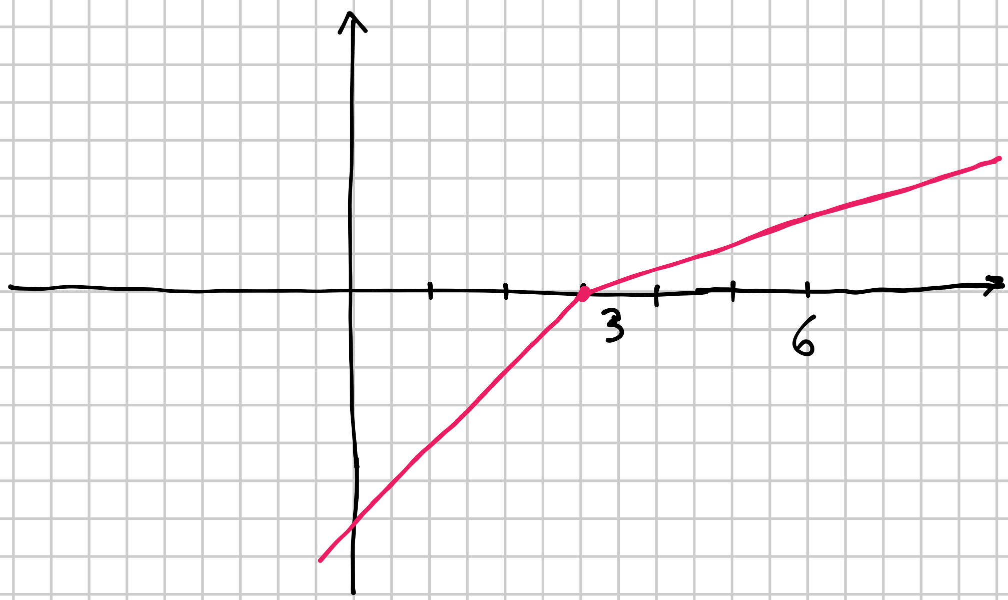
$$= \lim_{h \to 0^+} \frac{\frac{1}{3}(3+h) - 1}{h} = \lim_{h \to 0^+} \frac{\cancel{1} + \frac{1}{3}h - \cancel{1}}{h} = \frac{1}{3}$$

$$f'_-(3) = \lim_{h \to 0^-} \frac{f(3+h) - f(3)}{h} =$$

$$= \lim_{h \to 0^-} \frac{\cancel{3} + h - \cancel{3}}{h} = 1$$

3 è un PUNTO ANGOLOSO

(punto di non derivabilità)



80 $f(x) = \begin{cases} x^2 + x & \text{se } x \le 0 \\ \sqrt{x} & \text{se } x > 0 \end{cases}$, $\quad c = 0.$ $\quad f(0) = 0$

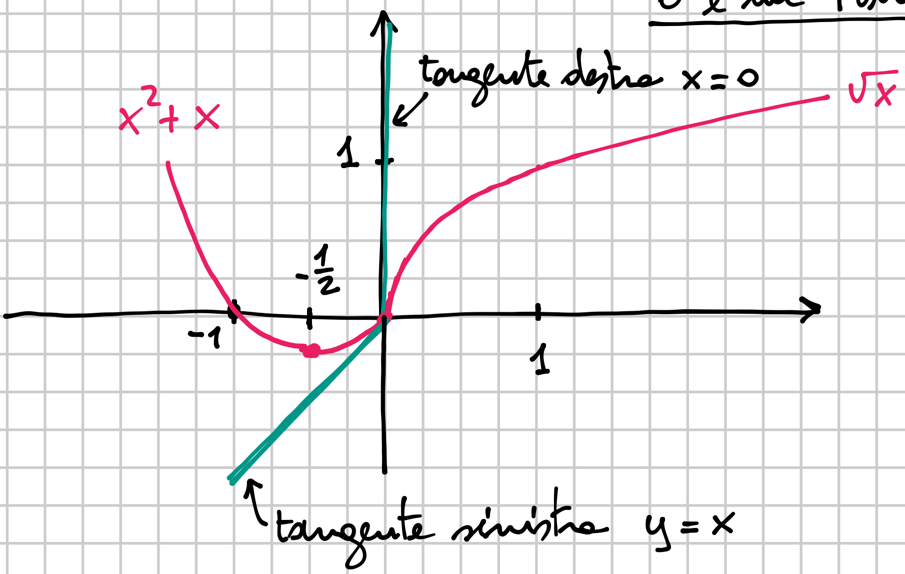
$$f'_+(0) = \lim_{h \to 0^+} \frac{f(0+h) - f(0)}{h} = \lim_{h \to 0^+} \frac{\sqrt{h}}{h} = +\infty$$

$$\frac{\sqrt{h}}{h} \cdot \frac{\sqrt{h}}{\sqrt{h}} = \frac{h}{h\sqrt{h}} = \frac{1}{\sqrt{h}}$$

$$f'_-(0) = \lim_{h \to 0^-} \frac{f(0+h) - f(0)}{h} =$$

$$= \lim_{h \to 0^-} \frac{h^2 + h}{h} = \lim_{h \to 0^-} \frac{\cancel{h}(h+1)}{\cancel{h}} = 1$$

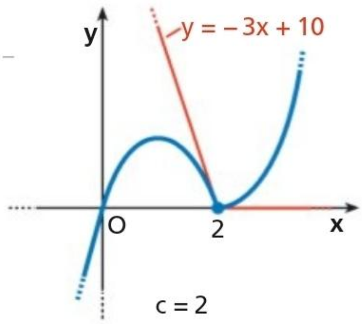
<u>0 è un PUNTO ANGOLOSO</u>



$$y_V = \left(-\frac{1}{2}\right)^2 + \left(-\frac{1}{2}\right) = \frac{1}{4} - \frac{1}{2} = -\frac{1}{4}$$

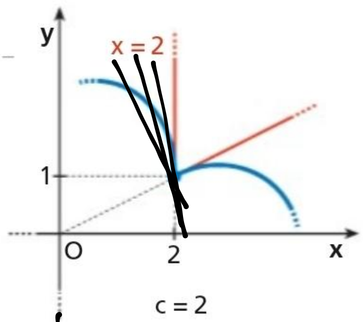
LEGGI IL GRAFICO Esamina i seguenti grafici e ricava, se è possibile, i valori delle derivate, sinistra e destra, nei punti indicati, utilizzando il significato geometrico di derivata.

85



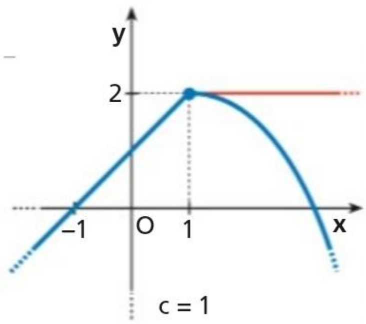
c = 2

87



c = 2

89



c = 1

$f'_-(2) = -3$

$f'_+(2) = 0$

2 è p.to angoloso

$f'_-(2) = -\infty$

$f'_+(2) = \frac{1}{2}$

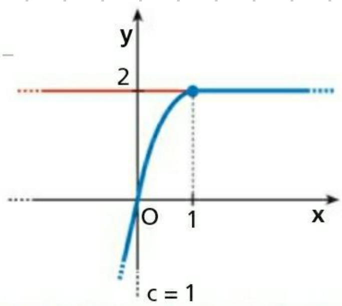
2 è p.to angoloso

$f'_-(1) = 1$

$f'_+(1) = 0$

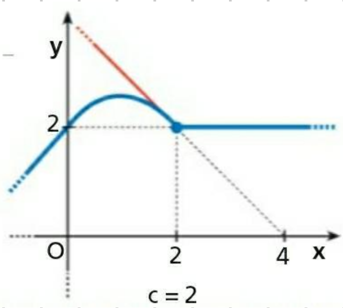
1 è p.to angoloso

86



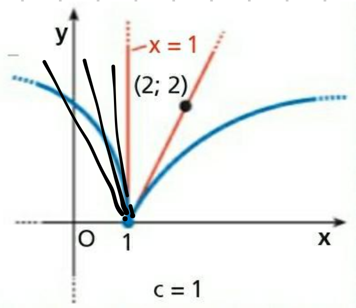
c = 1

88



c = 2

90



c = 1

$f'_-(1) = 0$

$f'_+(1) = 0$

1 è un punto di derivabilità

$f'(1) = 0$

f è derivabile in 1

$f'_-(2) = -1$

$f'_+(2) = 0$

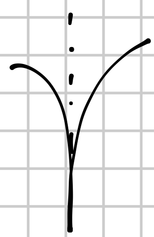
2 è p.to angoloso

$f'_-(1) = -\infty$

$f'_+(1) = 2$

1 è p.to angoloso

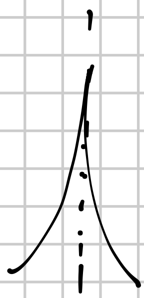
x_0 CUSPIDI



$f'_-(x_0) = -\infty$

$f'_+(x_0) = +\infty$

x_0



$f'_-(x_0) = +\infty$

$f'_+(x_0) = -\infty$