$$f(x)=\frac{2x+1}{x^2-4x+4}$$

$y=0$
$x=1$
$x=$ MIN

$$\int_{MIN}^{+1} f(x)\,dx = ?$$

50

DOMINIO $x \neq +2$ $\quad]-\infty,+2[\cup]+2,+\infty[$

SIMMETRIE

$$\frac{2x+1}{x^2-4x+4} \neq -\frac{2x+1}{x^2-4x+4}$$

$$-\frac{2x+1}{x^2-4x+4} \neq +\frac{-2x+1}{x^2+4x+4}$$

NE' PARI NE' DISPARI

INTERSEZIONI

$x \begin{cases} y=0 \\ 2x+1=0 \end{cases} \quad \begin{cases} x=-\frac{1}{2} \\ y=0 \end{cases}$

$y \begin{cases} x=0 \\ y=+\frac{1}{4} \end{cases}$

$P_1: \left(-\frac{1}{2},0\right)$

$P_2: \left(0,+\frac{1}{4}\right)$

SEGNO

$2x+1>0 \quad x>-\frac{1}{2}$

$x^2-4x+4>0 \quad \forall x \in \mathbb{R}-\{+2\}$

$f(x)>0$ SE $x>-\frac{1}{2}$

PRIMA DERIVATA

$$f'(x)=\frac{(2)(x^2-4x+4)-(2x+1)(2x-4)}{(x^2-4x+4)^2}$$

$$=\frac{2x^2-8x+8-4x^2+8x-2x+4}{(x-2)^4}$$

$$=\frac{-2(x^2+x-6)}{(x-2)^4}$$

$$f'(x)=-2\cdot\frac{(x+3)}{(x-2)^3}$$

LIMITI

$$\lim_{x\to-\infty} f(x)=0$$

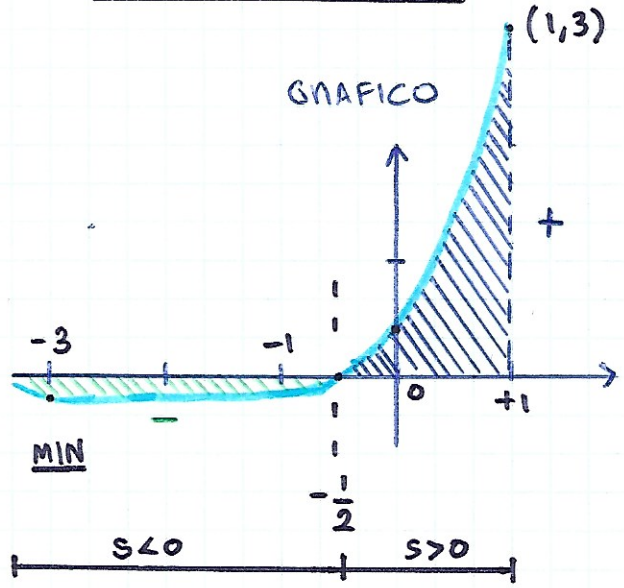
$$\lim_{x\to+\infty} f(x)=+\infty$$

MINIMO

$f'(x)=0 \quad -2\frac{(x+3)}{(x-2)^3}=0$

MIN : $\left(-3,-\frac{1}{5}\right)$

GRAFICO



CALCOLO DELL' INTEGRALE INDEFINITO

$$\int \frac{2x+1}{(x-2)^2}dx = \int \frac{2x+1+5-5}{(x-2)^2}dx =$$

$$= \int \frac{2x-4}{(x-2)^2}dx + \int \frac{5}{(x-2)^2}dx =$$

$$= 2\cdot\int\frac{1}{x-2} + 5\int\frac{1}{(x-2)^2} =$$

$$= 2\ln(x-2) - \frac{5}{x-2} + c$$

CALCOLO DELL' INTEGRALE DEFINITO

$$\int_{-3}^{+1} f(x)\,dx = -\int_{-3}^{-\frac{1}{2}} f(x)\,dx + \int_{-\frac{1}{2}}^{+1} f(x)\,dx = -\left[2\ln(x-2)-\frac{5}{x-2}\right]_{-3}^{-\frac{1}{2}} + \left[2\ln(x-2)-\frac{5}{x-2}\right]_{-\frac{1}{2}}^{+1}$$

$$= -\left[2\ln\left|-\frac{5}{2}\right| + \frac{5}{+\frac{5}{2}} - 2\ln|-5| - 1\right] + \left[2\ln|-2| + 1 - 2\ln\left(-\frac{5}{2}\right) + 1\right] =$$

$$= -4\ln\left(\frac{5}{2}\right) + 2\ln(5) + 2 = 2\left[\ln 5 - 2\ln\frac{5}{2}\right] + 2 =$$

$$= 2\left(\ln 5 - \ln\frac{25}{4}\right) + 2 = 2\left(\ln 5 - 2\ln\frac{5}{2}\right) + 2 =$$

$$= 2\left(\ln\frac{4}{5}\right) + 2$$