

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

1) DOMINIO $x^2+x+6 \neq 0$

$$x_{1,2} = \frac{-1 \pm \sqrt{1-24}}{2} = \frac{-1 \pm \sqrt{-23}}{2}$$

DOMINIO: $D = \forall x \in \mathbb{R}$

2) Int. asri

$$\begin{cases} x=0 \\ y = \frac{4^2}{6^3} = 2/3 \end{cases}$$

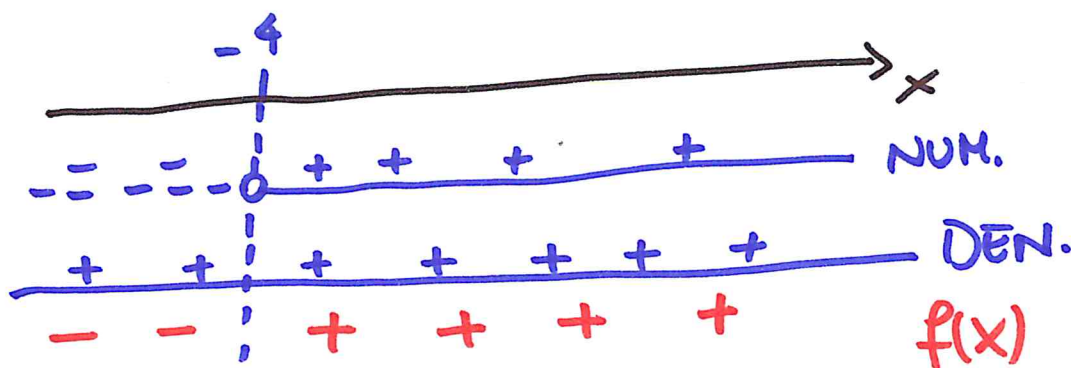
$$\boxed{A(0, 2/3)}$$

$$\begin{cases} y=0 \\ \frac{x+4}{x^2+x+6} = 0 \Rightarrow x+4=0 \\ x = -4 \end{cases}$$

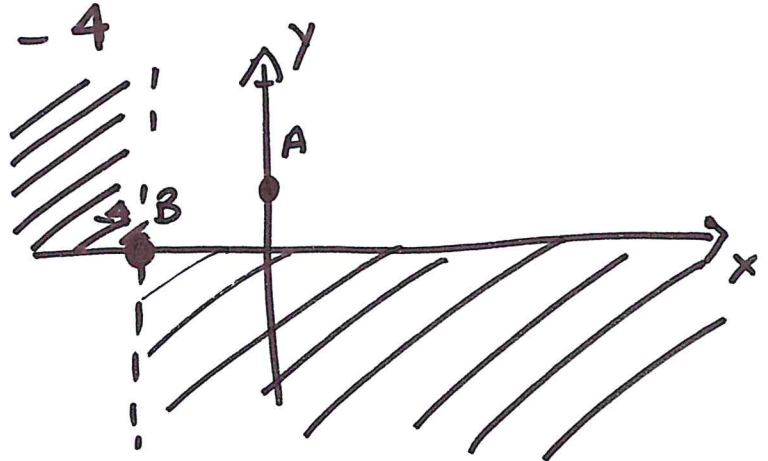
$$\boxed{B(-4, 0)}$$

3) SEGNO
 $f(x) > 0$

$$\begin{cases} x+4 > 0 \Rightarrow x > -4 \\ x^2+x+6 > 0 \Rightarrow \forall x \in \mathbb{R} \end{cases}$$



- $f(x) > 0 \Leftrightarrow x > -4$
- $f(x) = 0 \Leftrightarrow x = -4$
- $f(x) < 0 \Leftrightarrow x < -4$



ESERCIZIO

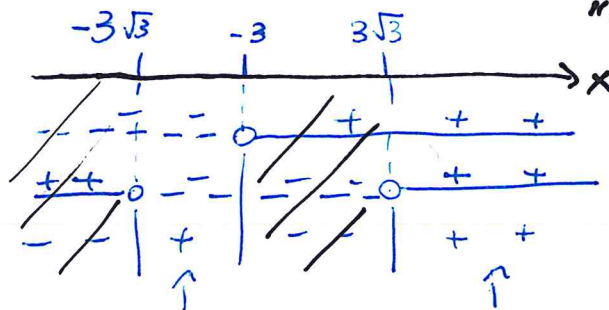
$$\lg_{1/2} \left(\frac{x+3}{x^2-27} \right) \geq 0$$

Prima di tutto studiamo il dominio

$$\frac{x+3}{x^2-27} > 0$$

$$\begin{cases} x+3 > 0 & \Rightarrow x > -3 \\ x^2-27 > 0 & \Rightarrow \begin{aligned} &x > 3\sqrt{3} \vee \\ &x < -3\sqrt{3} \end{aligned} \end{cases}$$

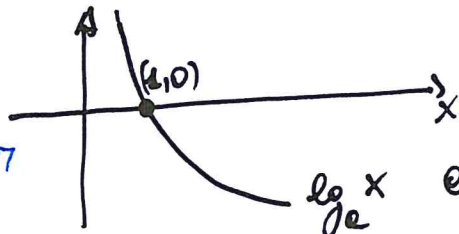
(soluzioni "esterne")



$$\underline{D: x \in]-3\sqrt{3}, -3[\cup]3\sqrt{3}, +\infty[}$$

OSSERVAZIONE:

le base del logaritmo $\bar{a}$ ~~quale~~ $0 < \bar{a} < 1$



$\lg_a x$ con $0 < \bar{a} < 1$

$$\lg_{1/2} \left(\frac{x+3}{x^2-27} \right) \geq 0$$

$$0 = \lg_{1/2} 1$$

$$\lg_{1/2} \left(\frac{x+3}{x^2-27} \right) \geq \lg_{1/2} 1$$

$$\frac{x+3}{x^2-27} \leq 1$$

cambio segno dato che la base $\bar{a}$ $0 < \text{base} < 1$
(guardare il grafico generale)

$$\frac{x+3}{x^2-27} - 1 \leq 0 \Rightarrow \frac{x+3-x^2+27}{x^2-27} \leq 0$$

$$\frac{-x^2+x+30}{x^2-27} \leq 0$$

$(-1) \cdot$

"

$$\geq (-1) \cdot 0$$

$\Rightarrow$ multipl. e destra e sinistra per $(-1) \Rightarrow$
RICORDARSI DI CAMBIARE IL VERSO! quando si fa questa operazione

$$\frac{x^2-x-30}{x^2-27} \geq 0$$

$$\begin{cases} x^2-x-30 \geq 0 \\ x^2-27 > 0 \end{cases} \rightarrow \begin{cases} \frac{1+\sqrt{1+120}}{2} = 6 \\ \frac{1-\sqrt{1+120}}{2} = -5 \end{cases}$$

ATTENZIONE



DOMINIO: NO

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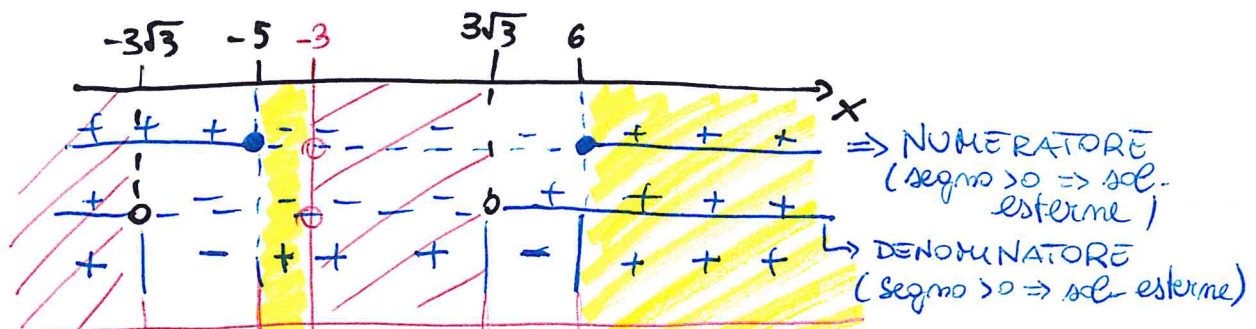
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$$\text{quindi: } \lg_{1/2} \left(\frac{x+3}{x^2-27} \right) \geq 0 \Leftrightarrow \boxed{x \geq 6 \vee -5 \leq x < -3}$$

$$< 0 \Leftrightarrow -3\sqrt{3} < x < -5 \vee 3\sqrt{3} < x < 6$$



ESERCIZI

DETERMINARE IL DOMINIO E
STUDIARE IL SEGNO DELLE SEGUENTI $f(x)$:

$$1) f(x) = -x^4 + 1$$

$$2) f(x) = \frac{2x - 1}{x^2 + 3}$$

$$3) f(x) = \frac{x^2 - x}{9 - x^2}$$

$$4) f(x) = (x - 1)e^{5x}$$

$$5) f(x) = \left(\frac{1}{3}\right)^x - 9$$

$$6) f(x) = \frac{1 - 2 \log x}{x^2}$$

$$7) f(x) = \frac{x^2 - 5x + 6}{\sqrt{2x - 3}}$$

$$8) f(x) = e^{\frac{1}{x^2 + 1}} + x^2$$