**456** $\log_{\frac{1}{10}}\left(\dfrac{x+1}{x-1}\right) > \log_{\frac{1}{10}}\left(\dfrac{x}{x+1}\right)$ $[x<-1]$

$$\begin{cases} \dfrac{x+1}{x-1} > 0 \\ \dfrac{x}{x+1} > 0 \\ \dfrac{x+1}{x-1} < \dfrac{x}{x+1} \end{cases}$$

$\Leftarrow$ CONSEGUENZA DELLE ALTRE 2 (SI PUÒ ELIMINARE)

perché $\frac{1}{10} < 1$

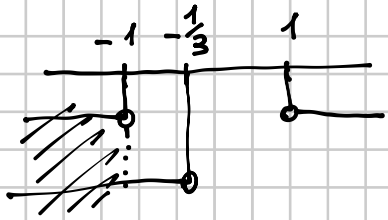
$$\begin{cases} \dfrac{x+1}{x-1} > 0 \\ \dfrac{x+1}{x-1} < \dfrac{x}{x+1} \end{cases}$$

$$\begin{cases} x<-1 \vee x>1 \\ \dfrac{x+1}{x-1} - \dfrac{x}{x+1} < 0 \end{cases} \qquad \begin{cases} x<-1 \vee x>1 \\ \dfrac{(x+1)^2 - x(x-1)}{\cancel{(x-1)(x+1)}} < 0 \end{cases}$$

so che è $>0$ per le C.E. $x<-1 \vee x>1$

$$\begin{cases} x<-1 \vee x>1 \\ \cancel{x^2}+2x+1-\cancel{x^2}+x<0 \end{cases}$$

$$\begin{cases} x<-1 \vee x>1 \\ 3x+1<0 \end{cases} \qquad \begin{cases} x<-1 \vee x>1 \\ x<-\dfrac{1}{3} \end{cases}$$




$\boxed{x<-1}$

**463** $\log_{\frac{1}{4}}(x^2-6)-\log_{\frac{1}{4}}(x-3)>-1$

C.E. $\begin{cases} x^2-6>0 \\ x-3>0 \end{cases}$ $\begin{cases} x<-\sqrt{6} \vee x>\sqrt{6} \\ x>3 \end{cases}$ $\Rightarrow x>3$

$$\log_{\frac{1}{4}}\frac{x^2-6}{x-3}>-\log_{\frac{1}{4}}\frac{1}{4}$$

$$\log_{\frac{1}{4}}\frac{x^2-6}{x-3}>\log_{\frac{1}{4}}\left(\frac{1}{4}\right)^{-1}$$

$$\log_{\frac{1}{4}}\frac{x^2-6}{x-3}>\log_{\frac{1}{4}}4$$

$\frac{1}{4}<1$

$$\begin{cases} \frac{x^2-6}{x-3}<4 \\ x>3 \end{cases}$$

$\frac{\Delta}{4}=2-6=-4<0$

$\begin{cases} x^2-6<4(x-3) \\ x>3 \end{cases}$ $\begin{cases} x^2-6<4x-12 \\ x>3 \end{cases}$ $\begin{cases} x^2-4x+6<0 \\ x>3 \end{cases}$

IMPOSSIBILE

**476** $2(\log_3 x)^2 + 3\log_3 x - 2 < 0$ $\left[\frac{1}{9} < x < \sqrt{3}\right]$

C.E. $x > 0$ $\log_3 x = t$

$$2t^2 + 3t - 2 < 0$$

$\Delta = 9 + 16 = 25$ $t = \dfrac{-3 \pm 5}{4} = \begin{cases} -\frac{8}{4} = -2 \\ \frac{2}{4} = \frac{1}{2} \end{cases}$

$$-2 < t < \frac{1}{2}$$

$$-2 < \log_3 x < \frac{1}{2}$$

applico l'esponenziale in base 3

$$3^{-2} < 3^{\log_3 x} < 3^{\frac{1}{2}}$$

$$\begin{cases} \frac{1}{9} < x < \sqrt{3} \\ x > 0 \end{cases} \Rightarrow \boxed{\frac{1}{9} < x < \sqrt{3}}$$

C.E.

**477** $[\log_2(x+5)]^2 - \log_2(x+5) - 6 > 0$

$$\left[-5 < x < -\frac{19}{4} \vee x > 3\right]$$

C.E. $x+5>0 \qquad x>-5$

$t = \log_2(x+5)$

$t^2 - t - 6 > 0$

$(t-3)(t+2) > 0$

$t < -2 \quad \vee \quad t > 3$

$\log_2(x+5) < -2 \quad \vee \quad \log_2(x+5) > 3$

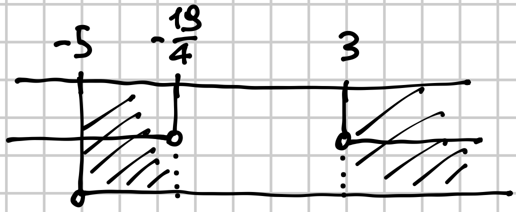
$2^{\log_2(x+5)} < 2^{-2} \qquad 2^{\log_2(x+5)} > 2^3$

$$\begin{cases} x+5 < \frac{1}{4} \quad \vee \quad x+5 > 8 \\ x > -5 \end{cases}$$

C.E.

$$\begin{cases} x < -5 + \frac{1}{4} \quad \vee \quad x > 3 \\ x > -5 \end{cases}$$

$$\begin{cases} x < -\frac{19}{4} \quad \vee \quad x > 3 \\ x > -5 \end{cases}$$




$$\boxed{-5 < x < -\frac{19}{4} \quad \vee \quad x > 3}$$