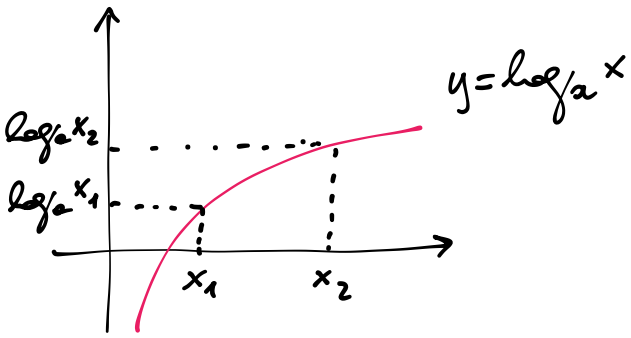
21/3/2018

COMPLEMENTI LOGARITMICI

DISEQUAZIONI LOGARITMICHE

$a > 1$



CRESCENTE!

$$x_1 < x_2 \iff \log_a x_1 < \log_a x_2$$

$$\log_3 (2-5x) > 2 \cdot \underbrace{\log_3 3}_{1}$$

$$\log_3 (2-5x) > \log_3 3^2$$

PASSO AGLI ARGOMENTI MANTENENDO LA DISUGUAGLIANZA PERCHÉ $a > 1$

$$\begin{cases} x < \frac{2}{5} \\ 2-5x > 9 \end{cases}$$

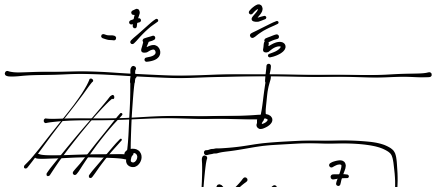
C.E.

$2-5x > 0$

$-5x > -2$

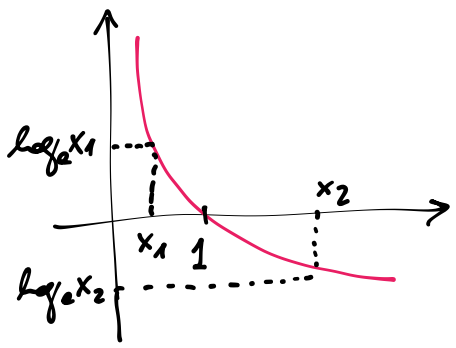
$x < \frac{2}{5}$

$$\begin{cases} x < \frac{2}{5} \\ -5x > 7 \end{cases} \qquad \begin{cases} x < \frac{2}{5} \\ x < -\frac{7}{5} \end{cases}$$



$$x < -\frac{7}{5}$$

$0 < a < 1$



DECRESCENTE!

$x_1 < x_2 \iff \log_a x_1 > \log_a x_2$

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$$\log_{\frac{1}{3}}(4x-3) > -1$$

C.E. $4x-3>0$

$$\log_{\frac{1}{3}}(4x-3) > -1 \cdot \log_{\frac{1}{3}}\frac{1}{3}$$

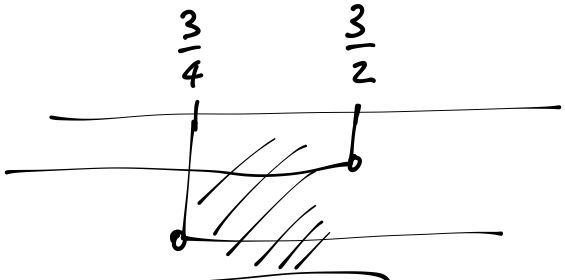
$$\log_{\frac{1}{3}}(4x-3) > \log_{\frac{1}{3}} 3$$

$0 < \frac{1}{3} < 1$

INVERTO LA DISUGUAGL. PERCHÉ $0<a<1$

$$\begin{cases} 4x-3 < 3 \\ 4x-3 > 0 \end{cases}$$

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



$$\frac{3}{4} < x < \frac{3}{2}$$

N 407

$$\frac{1}{2}\log(-x^2+2x) < \log x$$

C.E. $\begin{cases} -x^2+2x>0 \\ x>0 \end{cases}$

$$\log(-x^2+2x) < 2\log x$$

$$\log(-x^2+2x) < \log x^2$$

↓ BASE $10>1$ QUINDI MANTENGO LA DISUGUAGLIANZA

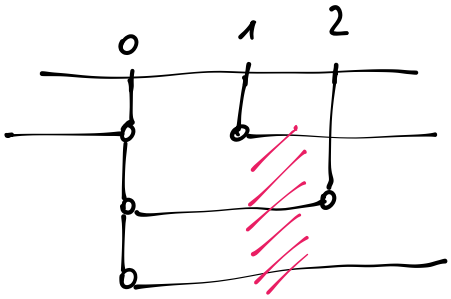
$$-x^2+2x < x^2$$

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

$\begin{cases} 2x^2-2x>0 \\ x^2-2x<0 \\ x>0 \end{cases}$ $\begin{cases} 2x(x-1)>0 \\ x(x-2)<0 \\ x>0 \end{cases}$

METODO NOT COOL

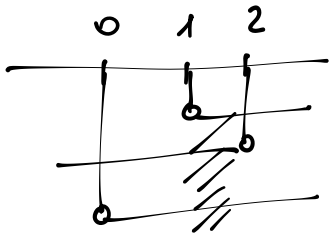
$\begin{cases} x<0 \ \vee \ x>1 \\ 0<x<2 \\ x>0 \end{cases}$



$1<x<2$

METODO MATH COOL : Osservo che c'è $x>0$

$\begin{cases} \cancel{2x}(x-1)>0 \\ \cancel{x}(x-2)<0 \\ x>0 \end{cases}$ $\begin{cases} x-1>0 \\ x-2<0 \\ x>0 \end{cases}$ $\begin{cases} x>1 \\ x<2 \\ x>0 \end{cases}$



$1<x<2$

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$3 \cdot 11^x = 2$ EQ. ESPONENZIALE

$11^x = \frac{2}{3}$ ↓ applico ad entrambi i membri $\log_{11}$

$\log_{11}(11^x) = \log_{11}\left(\frac{2}{3}\right)$

$\boxed{x = \log_{11}\frac{2}{3}}$ per ottenere la soluzione del libro

$\log_{11}\frac{2}{3} = \frac{\log\frac{2}{3}}{\log 11} = \boxed{\frac{\log 2 - \log 3}{\log 11}}$

RISULTATO DEL LIBRO