20/2/2018

288 $34\left(\frac{3}{5}\right)^x < 25\left(\frac{9}{25}\right)^x + 9$ $[x < 0 \vee x > 2]$

$$t = \left(\frac{3}{5}\right)^x$$

$$\left(\frac{9}{25}\right)^x = \left[\left(\frac{3}{5}\right)^2\right]^x =$$

$$= \left[\left(\frac{3}{5}\right)^x\right]^2 = t^2$$

↓

$$34t < 25t^2 + 9$$

$$-25t^2 + 34t - 9 < 0$$

$$25t^2 - 34t + 9 > 0$$

$$\frac{\Delta}{4} = 289 - 225 = 64$$

$$t = \frac{17 \pm 8}{25} = \begin{cases} \frac{9}{25} \\ 1 \end{cases}$$

$$t < \frac{9}{25} \quad \vee \quad t > 1$$

↓

$$\left(\frac{3}{5}\right)^x < \frac{9}{25}$$

$$\left(\frac{3}{5}\right)^x < \left(\frac{3}{5}\right)^2$$ perché $\frac{3}{5} < 1$

↓ INVERTIRE

$$x > 2$$

↘

$$\left(\frac{3}{5}\right)^x > 1$$

$$\left(\frac{3}{5}\right)^x > \left(\frac{3}{5}\right)^0$$

↓

$$x < 0$$

$$\boxed{x < 0 \quad \vee \quad x > 2}$$

289 ●○ $9\left(\frac{2}{3}\right)^{x} + 2 + 4\left(\frac{2}{3}\right)^{-x} \leq 0$ [impossibile]

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

$9t + 2 + 4t^{-1} \leq 0$

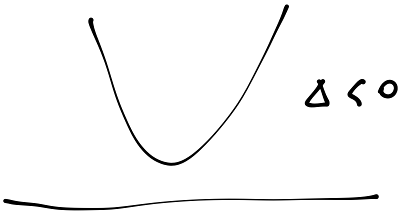
$9t + 2 + \frac{4}{t} \leq 0$

$\frac{9t^2 + 2t + 4}{\cancel{t}} \leq 0$

↖ POSSO PERCHÉ $t > 0$

$9t^2 + 2t + 4 \leq 0$ IMPOSSIBILE

$\frac{\Delta}{4} = 1^2 - 36 = -35$



$\Delta < 0$

292 $5^{\frac{2}{x}} - \frac{26}{25}5^{\frac{1}{x}} > -\frac{1}{25}$ $\left[-\frac{1}{2} < x < 0 \vee x > 0\right]$

$t = 5^{\frac{1}{x}}$

C.E.
$x \neq 0$

IN REALTÀ VIENE AUTOMATICAMENTE NEL RISULTATO

$$t^2 - \frac{26}{25}t > -\frac{1}{25}$$

$$25t^2 - 26t + 1 > 0$$

$$\frac{\Delta}{4} = 169 - 25 = 144$$

$$t = \frac{13 \pm 12}{25} = \begin{cases} \frac{1}{25} \\ 1 \end{cases}$$

$$t < \frac{1}{25} \quad \vee \quad t > 1$$

$$5^{1/x} < 5^{-2} \qquad 5^{\frac{1}{x}} > 5^0$$

$$\frac{1}{x} < -2 \qquad \frac{1}{x} > 0$$

$$\frac{1}{x} + 2 < 0 \qquad \downarrow$$

$$\frac{1+2x}{x} < 0 \qquad x > 0$$

$$\boxed{-\frac{1}{2} < x < 0 \quad \vee \quad x > 0}$$

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

2] $x > 0$

$-\frac{1}{2}$ 0

1]

−	+	+
−	−	+
+	⊖	+

$$-\frac{1}{2} < x < 0$$

294 $\frac{-6}{2^x-2}+\frac{9}{2^x-1}<0$ $[x<0 \vee 1<x<2]$

$t = 2^x$

$$\frac{-6}{t-2}+\frac{9}{t-1}<0$$

$$\frac{-6(t-1)+9(t-2)}{(t-2)(t-1)}<0$$

$$\frac{-6t+6+9t-18}{(t-2)(t-1)}<0 \qquad \frac{3t-12}{(t-2)(t-1)}<0$$

$$\frac{\cancel{3}(t-4)^{N_1}}{\underset{D_1}{(t-2)}\underset{D_2}{(t-1)}}<0$$

N_1] $t-4>0$ $t>4$

D_1] $t-2>0$ $t>2$

D_2] $t-1>0$ $t>1$

	1		2		4	
−		−		−	0	+
−		−	×	+		+
−	×	+		+		+
−	×	+	×	−	0	+

$t<1 \quad \vee \quad 2<t<4$

$2^x<1 \quad \vee \quad 2<2^x<4$

$$\boxed{x<0 \quad \vee \quad 1<x<2}$$

312 $\begin{matrix} N \\ \dfrac{3\cdot 3^{2x}-4\cdot 4^{2x}}{\left|-1+5^{x+1}\right|-4} < 0 \\ D \end{matrix}$ $\left[x<-\frac{1}{2} \vee x>0\right]$

$N>0 \quad 3\cdot 3^{2x}-4\cdot 4^{2x}>0$

$3\cdot 3^{2x}>4\cdot 4^{2x}$

$\dfrac{3^{2x}}{4^{2x}}>\dfrac{4}{3} \qquad \left(\dfrac{3}{4}\right)^{2x}>\left(\dfrac{3}{4}\right)^{-1} \qquad 2x<-1$

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

$D>0 \quad \left|-1+5^{x+1}\right|-4>0$

$\left|5^{x+1}-1\right|>4$

$|f(x)|>K$

$\Updownarrow$

$f(x)<-K \ \vee \ f(x)>K$

$5^{x+1}-1<-4 \quad \vee \quad 5^{x+1}-1>4$

$5^{x+1}<-3 \qquad\qquad 5^{x+1}>5$

IMPOSS. $\qquad x+1>1$

$\boxed{x>0}$

$$\begin{array}{c|c|c|c}
 & -\frac{1}{2} & & 0 \\
N & + & - & - \\
D & - & - & + \\
\hline
 & \ominus & + & \ominus
\end{array}$$

$\boxed{\boxed{x<-\frac{1}{2} \ \vee \ x>0}}$