Pag 670 n 528

$$\frac{1}{2}\log_4 8x - [\log_4 8x]^2 < \frac{1}{2} \qquad \log_4 8x = t$$

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

$$-2t^2 + t - 1 < 0$$

$$2t^2 - t + 1 > 0 \qquad \Delta = 1 - 8 = -7 < 0 \qquad \forall t \in \mathbb{R}$$

Dato che $\log_4 8x = t$ va bene ogni valore di x purché soddisfi le condizioni di esistenza $8x > 0$ cioè $x > 0$

n 529

$$\log_2(\log_3(x+4)) > \overbrace{0}^{\log_2(1)}$$

$$\log_3(x+4) > \overbrace{1}^{\log_3(3)}$$

$$x + 4 > 3 \rightsquigarrow \boxed{x > -1}$$

C.E.: $\begin{cases} x+4>0 \\ \log_3(x+4) > \underbrace{0}_{\log_3(1)} \end{cases}$

$\begin{cases} x > -4 \\ x+4 > 1 \rightsquigarrow x > -3 \end{cases}$

$\rightsquigarrow \boxed{x > -3}$

Sol: $x > -1$

$(-1; +\infty)$

n 530: $$\frac{4 - \log_2 x}{\log_2(x-2)} \geq 0$$

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

$\boxed{x > 2}$

$N \geq 0 \qquad 4 - \log_2 x \geq 0 \qquad \log_2 x \leq \overbrace{4}^{\log_2(2^4)} \qquad x \leq 2^4$

$D > 0 \qquad \log_2(x-2) > 0 \qquad x - 2 > 1 \qquad x > 3$

		3		16	
N	+		+	●	−
D	−	o	+		+
	−		+		−

$\boxed{3 < x \leq 16}$

Sol finale: $3 < x \leq 16$

$(3; 16]$

Pag 671 n 549

$$\begin{cases} \log_2(4^x - 2) < 1 \\ \log_2 x + 2 > 0 \end{cases} \qquad \begin{cases} \frac{1}{2} < x < 1 \\ x > \frac{1}{4} \end{cases} \rightsquigarrow$$

Sol: $\frac{1}{2} < x < 1$

$\left(\frac{1}{2} ; 1\right)$

(I) $4^x - 2 < 2$

$4^x < 4^1$

$\boxed{x < 1}$

C.E. $4^x > 2 \to 2^{2x} > 2$

$\to 2x > 1 \quad \boxed{x > \frac{1}{2}}$

$\rightsquigarrow$ con la C.E. $\rightsquigarrow$ $\frac{1}{2} < x < 1$

(II) $\log_2 x > \overbrace{-2}^{\log_2(2^{-2})}$

$x > 2^{-2} = \frac{1}{4}$

C.E. $\boxed{x > 0}$

$\rightsquigarrow$ con la C.E. $x > \frac{1}{4}$

n 630

$$\left| \left(\frac{2}{5}\right)^x - \left(\frac{5}{2}\right)^{-2x} \right| < 2$$

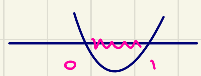
$$\left| \left(\frac{2}{5}\right)^x - \left(\frac{2}{5}\right)^{2x} \right| < 2$$

$\left(\frac{2}{5}\right)^x = B$

$$| B - B^2 | < 2$$

Caso a: $B - B^2 \geq 0 \rightsquigarrow B^2 - B \leq 0 \qquad B(B-1) \leq 0$

$B = 0 \; , \; B = 1$



$\to 0 \leq B \leq 1$

$B - B^2 < 2 \qquad B^2 - B + 2 > 0 \quad \forall B \in \mathbb{R}$

$\Delta = 1 - 8 = -7 < 0$

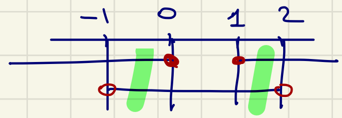
$\rightsquigarrow$ $\boxed{\text{Sol a. } 0 \leq B \leq 1}$

Caso b: $B - B^2 \leq 0 \rightsquigarrow B \leq 0 \lor B \geq 1$

$B^2 - B < 2 \rightsquigarrow B^2 - B - 2 < 0$

$(B-2)(B+1) < 0 \qquad \underline{-1 < B < 2}$

La interseco con le condizioni del caso B.



$$\boxed{\underline{\text{Sol } b}\ .\ -1 < B \leq 0 \quad \vee \quad 1 \leq B < 2}$$

Unisco $\underline{\text{Sol } a}$ e $\underline{\text{Sol } b}$: $\boxed{-1 < B < 2}$

Mi ricordo $B = \left(\frac{2}{5}\right)^x$

$-1 < \left(\frac{2}{5}\right)^x$ Sempre vero : esponenziale sempre >0

$\left(\frac{2}{5}\right)^x < 2 \qquad \boxed{x > \log_{\frac{2}{5}} 2} = \dfrac{\log 2}{\log \frac{2}{5}} = \dfrac{\log 2}{\log(2) - \log(5)}$

$||| 3^x | + 2^x | + 5^x | > 0 \qquad \sqrt{|\underbrace{3+2^x}_{\geq 3}|} > 1$