Pag 682 n 36

$$\left[\log_4(3x)\right]^2 - \log_4(9x^2) + 1 \leq 0$$

$$\left[\log_4(3x)\right]^2 - \log_4\left((3x)^2\right) + 1 \leq 0$$

$$\left[\log_4(3x)\right]^2 - 2\log_4(3x) + 1 \leq 0$$

$$\left(\log_4(3x) - 1\right)^2 \leq 0$$

Può fare solo 0 $\quad \log_4(3x) = 1 \qquad 3x = 4 \qquad x = \frac{4}{3}$

Pag 670 n527

$\log_2(3x-2) + \log_{\frac{1}{2}}(2x-1) \leq 2$

C.E. $\begin{cases} 3x-2>0 \\ 2x-1>0 \end{cases}$ $\begin{cases} x>\frac{2}{3} \\ x>\frac{1}{2} \end{cases}$

$\boxed{x>\frac{2}{3}}$

$$\log_2(3x-2) + \frac{\log_2(2x-1)}{\underbrace{\log_2\left(\frac{1}{2}\right)}_{-1}} \leq 2$$

$$\log_2(3x-2) - \log_2(2x-1) \leq 2$$

$$\log_2\left(\frac{3x-2}{2x-1}\right) \leq \log_2(4)$$

$$\frac{3x-2}{2x-1} \leq 4 \qquad \frac{3x-2-8x+4}{2x-1} \leq 0 \qquad \frac{-5x+2}{2x-1} \leq 0$$

$$\frac{5x-2}{2x-1} \geq 0$$

$N \geq 0 \quad x \geq \frac{2}{5}$

$D > 0 \quad x > \frac{1}{2}$

$\boxed{x \leq \frac{2}{5} \quad \vee \quad x > \frac{1}{2}}$

⤳ Intersecando $\boxed{x > \frac{2}{3}}$

n 601

$$3^{\frac{x+1}{2}} \cdot 7^{x-1} = \frac{1}{49^x \cdot 9^x}$$

$$3^{\frac{x+1}{2}} \cdot 3^{2x} \cdot 7^{x-1} \cdot 7^{2x} = 1$$

$$3^{\frac{x+1}{2}+2x} \cdot 7^{3x-1} = 1$$

$$3^{\frac{x+1+4x}{2}} \cdot 7^{3x-1} = 1$$

$$3^{\frac{5x+1}{2}} \cdot 7^{3x-1} = 1$$

$$\left(3^{\frac{5}{2}}\right)^x \cdot 3^{1/2} \cdot \left(7^3\right)^x \cdot \frac{1}{7} = 1$$

$$\left(3^{\frac{5}{2}} \cdot 7^3\right)^x = \frac{7}{3^{1/2}}$$

$$x = \log_{3^{\frac{5}{2}} \cdot 7^3}\left(\frac{7}{3^{1/2}}\right)$$

$$x = \frac{\ln\left(\frac{7}{3^{1/2}}\right)}{\ln\left(3^{5/2} \cdot 7^3\right)} = \frac{\ln(7) - \frac{1}{2}\ln(3)}{\frac{5}{2}\ln(3) + 3\ln(7)} = \frac{2\ln(7) - \ln(3)}{6\ln(7) + 5\ln(3)}$$

333 pag 617

$$\frac{2\cdot 4^x - 5\cdot 2^x + 2}{(25^x-5)(81\cdot 3^x-3)} \leq 0$$

$N \geq 0$ $\quad 2^x = t$

$$2t^2-5t+2 \geq 0$$
$$2t^2-4t-t+2 \geq 0$$
$$2t(t-2)-(t-2) \geq 0$$
$$(2t-1)(t-2) \geq 0$$

$t \leq \frac{1}{2} \quad \vee \quad t \geq 2$

$2^x \leq \frac{1}{2} \quad \vee \quad 2^x \geq 2$

$x \leq -1 \quad \vee \quad x \geq 1$

$D > 0$: $\quad 25^x - 5 > 0 \quad 5^{2x} > 5^1 \quad 2x > 1 \quad x > \frac{1}{2}$

$\quad 81\cdot 3^x - 3 > 0 \quad 3^x > 3^{-3} \quad x > -3$

		-3		-1		$1/2$		1	
N	+		+	●	−		−	●	+
	−		−		−	0	+		+
	−	0	+		+		+		+
	+		−		+		−		+

$$\boxed{-3 < x \leq -1 \quad \vee \quad \frac{1}{2} < x \leq 1}$$

5. Risolvi i seguenti quesiti su logaritmi ed esponenziali (71-exp, pag 696)

- Si consideri l'espressione algebrica $g(x) = \frac{2}{\log_3(x)} + \log_{\frac{1}{x}} 9$. Si calcoli il dominio naturale di g, si dica se è iniettiva e si disegni il suo grafico
- Determinare tutti i valori reali di x tali per cui $\left[\frac{1}{5}(x^2 - 10x + 26)\right]^{x^2-6x+1} = 1$
- Calcolare il valore della seguente espressione:

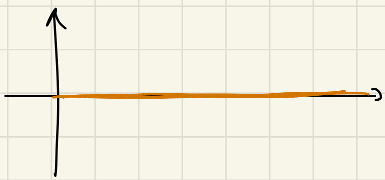
$$\underbrace{\frac{1}{e} \cdot \log_2(2^{\overbrace{\log_3(3^{\overbrace{\log_4(4^e)}^{e}})}^{e}})}_{\frac{1}{e}\cdot e = 1} + \cancel{\log_{\log_5(e)}\left(\frac{\ln 6}{\ln 5}\right)} - \underbrace{\frac{7}{4}\ln(e^{4})}_{-7} + \overbrace{\log_7(\underbrace{\log_7(\underbrace{\log_7(\underbrace{\log_7(7^{7^{7^7}})}_{7^{7^7}})}_{7^7})}_{7})}^{1} - \cancel{\log_{\log_5(e)} \log_5(6)} = -5$$

$\frac{\ln 6}{\ln 5}$; $=$

[Punti 15]

1) $g(x) = \frac{2}{\log_3 x} + \log_{\frac{1}{x}} 9 = \frac{2}{\log_3 x} + \frac{\log_3 9}{\log_3 \frac{1}{x}}$ $\rightarrow \log_3 x^{-1}$

$= \frac{2}{\log_3 x} - \frac{2}{\log_3 x} = 0$

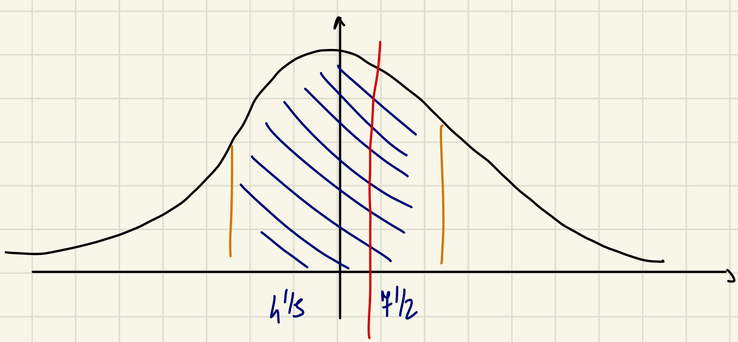


$y = 0$

2) $\left[\frac{1}{5}(x^2 - 10x + 26)\right]^{x^2-6x+1} = 1$

a) $x^2 - 6x + 1 = 0$

b) $\frac{1}{5}(x^2 - 10x + 26) = 1$



$$\left[\log_3 (x-1)\right]^2 = \log_9 (x-1)^2 \qquad 0$$

$$\frac{3+\cancel{2}}{x+\cancel{2}} = \log_3 x$$

$A = (2,3) \qquad B = (2,5)$

$$m = \frac{5-3}{2-2} \qquad m = 1 \qquad m = 0$$

0