

## Sistemi di disequazioni logaritmiche

1	$\begin{cases} \log_2 x > 3 \\ \log_4 x < 3 \end{cases}$	$8 < x < 64$
2	$\begin{cases} \log_9 x \leq -\frac{1}{2} \\ \log_{\frac{1}{10}} x > 1 \end{cases}$	$0 < x < \frac{1}{10}$
3	$\begin{cases} \frac{1}{2} \log_{\frac{1}{5}} x < 2 \\ \log_{0,25} x \geq 0 \end{cases}$	$0 < x < 0,0016$
4	$\begin{cases} \ln x \leq 3 \\ \ln(x-1) < 4 \end{cases}$	$1 < x \leq e^3$
5	$\begin{cases} \log(x-1) + \log(2x-3) > 0 \\ \log_2 x + 3 \geq 0 \end{cases}$	$x > 2$
6	$\begin{cases} \log_{\sqrt{2}} x \geq 4 \\ 3 \log_2(x-2) < \log_2(x-2) + \log_2 4 \end{cases}$	$x = 4$
7	$\begin{cases} \log_{\frac{1}{2}}(4x-3) > -1 \\ \log_4 x < \frac{1}{2} \end{cases}$	$\frac{3}{4} < x < \frac{5}{4}$
8	$\begin{cases} \ln x > -1 \\ \frac{1}{2} \ln x < \sqrt{2} \end{cases}$	$e^{-1} < x < e^{2\sqrt{2}}$
9	$\begin{cases} \log(2-x) > \log(x+2) \\ \log_3(2-5x) > 1 \end{cases}$	$-2 < x < -\frac{1}{5}$
10	$\begin{cases} \log_{\frac{1}{3}}(6x-2) + \log_{\frac{1}{3}}(x+1) - \log_{\frac{1}{3}}(5x+1) > \log_{\frac{1}{3}} 4 \\ \log_4 4 > \log_4 \left( \frac{2-x}{x+3} \right) \end{cases}$	$\frac{1}{3} < x < 2$
11	$\begin{cases} \log_{\frac{1}{2}}(x+5) \geq -3 \\ \log_4(x^2-x) - \log_4 6 < 0 \end{cases}$	$-2 \leq x < 0 \cup 1 < x \leq 3$
12	$\begin{cases} \log_4(2x-1) \leq 1 \\ \log_3(x-2) > \log_3(2x-x^2) \end{cases}$	$\emptyset$
13	$\begin{cases} \log_{0,5} \frac{x+1}{x-1} < \log_{0,5} x \\ 0,5 - \log_{0,5} x \geq 1 \end{cases}$	$\sqrt{2} \leq x < 1 + \sqrt{2}$
14	$\begin{cases} \log_{12}(x-3) > 1 \\ \log(\log x) > 0 \end{cases}$	$x > 15$
15	$\begin{cases} \log_{\frac{1}{3}} x > \log_{\frac{1}{3}} \left( \frac{4+x}{2x+11} \right) \\ \log_5(12-x) + \log_5(7-x) > 2 \log_5(x+3) \end{cases}$	$0 < x < \frac{\sqrt{33}-5}{2}$
16	$\begin{cases} \log_4(2-x) - \log_4 2 < \log_4 3 + \log_4(x-1) \\ \ln(4-x) + \ln x < \ln(x+6-x^2) \end{cases}$	$\frac{8}{7} < x < 2$

17	$\begin{cases} \log_{\frac{1}{3}}(x^2 - 3x - 4) < \log_{\frac{1}{3}}(x^2 - x - 2) \\ \log_{\frac{1}{20}}\left(\frac{x}{x+1}\right) < \log_{\frac{1}{20}}\left(\frac{x+1}{x-1}\right) \end{cases}$	$x < -1$
18	$\begin{cases} \ln 2x \leq 2 \ln x + 1 \\ \sqrt{2} > \frac{1}{2} \ln x \end{cases}$	$\frac{2}{e} \leq x < e^{2\sqrt{2}}$
19	$\begin{cases} \log(x^2 - 3x + 10) < 1 \\ \log_5(x^2 + 6x + 8) > \log_5(x^2 + 4x - 5) \end{cases}$	$1 < x < 3$
20	$\begin{cases} \log_{\frac{1}{4}}(2 - x) > \log_{\frac{1}{4}}(1 - 2x) \\ \log_{\frac{1}{3}}(3x - 5) < \log_{\frac{1}{3}}(2x - 1) \end{cases}$	$\emptyset$
21	$\begin{cases} \log_{\frac{3}{2}}(4 - 3x) \geq 0 \\ \log_2 \frac{x+3}{x} > 1 \end{cases}$	$0 < x \leq 1$
22	$\begin{cases} \log_2(4x + 1) - \log_2(5 - x) > \log_2(2x - 1) \\ \log_{\frac{3}{5}}(2 - x^2) < \log_{\frac{3}{5}}(1 - 2x) \end{cases}$	$\emptyset$
23	$\begin{cases} \log_3(x + \sqrt{3}) > -\log_3(x - \sqrt{3}) \\ \log_2(x + 1) < \log_2 2 + \log_2(x - 1) \end{cases}$	$x > 3$
24	$\begin{cases} (\log_2 x)^2 - 2 \log_2 x - 3 < 0 \\ \log_2(x^2 + 6x + 8) > \log_2(x^2 - 3x) \end{cases}$	$3 < x < 8$
25	$\begin{cases} \log_{\frac{1}{2}}(8x - 7) > \log_{\frac{1}{2}}(x + 4) + \log_{\frac{1}{2}}(x - 4) \\ \log_4(\sqrt{x - 1} - 2) < 0 \end{cases}$	$9 < x < 10$
26	$\begin{cases} \frac{\log_2(3 - x) + \log_{\frac{1}{2}} x + 4}{4 + \log_{\frac{1}{2}} x} \geq 1 \\ \log_2 x < \log_2 x^2 + \log_{\frac{1}{2}}(2 - x)^{\frac{1}{2}} \end{cases}$	$1 < x \leq 2$
27	$\begin{cases} (\log x)^2 - 4 \log x + 3 < 0 \\ 2 \log_{\frac{1}{10}} x \geq \log_{\frac{1}{10}} 192 + \log_{\frac{1}{10}} 3 - \log_{\frac{1}{10}} 4 \end{cases}$	$10 < x \leq 12$
28	$\begin{cases} (\log x)^4 > (\log x)^5 \\ 2 \log_3 x - \log_3(x + 2) \leq 0 \end{cases}$	$0 < x < 1 \cup 1 < x \leq 2$
29	$\begin{cases} \log_{\frac{1}{4}}^2 x < \frac{1}{4} \\ 2 - \log_{\frac{1}{3}} x > \log_{\frac{1}{3}}^2 x \end{cases}$	$\frac{1}{2} < x < 2$
30	$\begin{cases} \log_{\frac{1}{2}}^2 x + \log_{\frac{1}{2}} x - 2 > 0 \\ 2^2 \geq \log_2^2 x \end{cases}$	$\frac{1}{4} \leq x < \frac{1}{2}$

31	$\begin{cases} \log_2^2(x+5) - 6 > \log_2(x+5) \\ \log_1 x - 4 + 2 \log_1 x \\ \frac{\log_1 x - 4 + 2 \log_1 x}{2 - \log_1 x} + \log_{\frac{1}{2}} x < 0 \end{cases}$	$x > 3$
32	$\begin{cases} 1 - (\ln x)^2 \leq 0 \\ (\ln x)^2 - 3 \ln x - 4 < 0 \end{cases}$	$e \leq x < e^4$
33	$\begin{cases} \log_4(3x-2)^{\frac{1}{2}} < \frac{1}{2} + \log_4^2(3x-2) \\ 2 + \log_{\sqrt{2}}(3-x) > \log_{\sqrt{2}}(2x+1) \end{cases}$	$\frac{2}{3} < x < \frac{5}{4}$
34	$\begin{cases} \log_{\frac{2}{3}}(3x-7)^2 - \log_{\frac{2}{3}}(3x-7) < \log_{\frac{2}{3}}(11-2x)^2 - \log_{\frac{2}{3}}(11-2x) \\ \log_2^2(x-1) - \log_2(x-1) - 2 \leq 0 \end{cases}$	$\frac{18}{5} < x \leq 5$
35	$\begin{cases} \frac{(x-2)(x+2)}{\log_2 x + 2} \leq 0 \\ \log_2(2^{2x} - 2) < 1 \end{cases}$	$\frac{1}{2} < x < 1$
36	$\begin{cases} \frac{3 - \log_2 x  +  x  + 1}{ x  + 1} \geq 1 \\ \log_2[\log_2(1-x)] - \log_2 2 \geq 0 \end{cases}$	$-8 \leq x \leq -3$
37	$\begin{cases} [1 + \log_3^2(x-1) - 2 \log_3(x-1)] \cdot \log_4(x-1) > 0 \\ \log_{\frac{1}{2}} \sqrt{x} > -\log_2 x \end{cases}$	$x > 2 \cup x \neq 4$
38	$\begin{cases} \log_{\frac{1}{2}}^4 x \geq \log_{\frac{1}{2}}^3 x \\ \log_1 x - \frac{1}{2} \\ \frac{\log_1 x - \frac{1}{2}}{\log_1 x} \leq 0 \end{cases}$	$\emptyset$
39	$\begin{cases} (\ln^2 x - 4)(2^{\sqrt{x}} - 2^x) \leq 0 \\ \ln^4 x - 5 \ln^2 x \geq -4 \end{cases}$	$x = e^{-2} \cup$ $e^{-1} \leq x \leq 1 \cup$ $x \geq e^2$
40	$\begin{cases} \frac{[\log(x-1)] \cdot [\log(x+1)]}{\log[(x-1)(x+1)]} \leq 0 \\ \log_2 \sqrt{x(2-x)} < 0 \end{cases}$	$\sqrt{2} < x < 2$
41	$\begin{cases} \ln(x+3) > 0 \\ \ln(x-5) < \ln(2x) \end{cases}$	$x > 5$

42	$\begin{cases} \log_{\frac{1}{3}}(x+1) > -2 \\ \frac{x}{x+2} < 0 \end{cases}$	$-1 < x < 0$
43	$\begin{cases} 2 \log_{\frac{1}{2}}(x-1) - \log_{\frac{1}{2}}(x+5) < 1 \\ \log_9(2x-1) < \log_3(x) \end{cases}$	$x > 3$
44	$\begin{cases} \log_{\frac{1}{2}}(\cos x) > 1 \\ \log\left(\sin x + \frac{1}{2}\right) < 0 \end{cases} \quad (0 \leq x \leq 2\pi)$	$\emptyset$
45	$\begin{cases} \log_2(x^2 - 1) < 3 \\ x^4 + 6x^2 + 9 \geq 0 \\  x  - 2 < 0 \end{cases}$	$-2 < x < -1 \cup 1 < x < 2$
46	$\begin{cases} \log(x+5) > \log(x+3) \\ \ln(x^3 + 2x^2) > 0 \end{cases}$	$\frac{-1 - \sqrt{5}}{2} < x < 0$ $\cup 0 < x < \frac{-1 + \sqrt{5}}{2}$ $\cup x > 1$
47	$\begin{cases} \ln(x-1) - \ln(2x+3) < \ln(x+1) - \ln(2x-3) \\ \log_x(\sqrt{x+1}) > 1 \end{cases}$	$\frac{3}{2} < x < 2$
48	$\begin{cases} \log x+3  > \log 3x-5  \\ \log_{\frac{1}{10}}(4^{x-1}) < \log_{\frac{1}{10}}(16) \end{cases}$	$3 < x < 4$
49	$\begin{cases} \log_2(x^3 + 3x^2 + 4x) > 3 \\ \log_{\frac{1}{5}}\sqrt{x+5} > \log_{\frac{1}{5}}(x-1) \end{cases}$	$x > 4$
50	$\begin{cases} \ln(\tan x) > 0 \\ \log_{\frac{2}{3}}(\sin x) < \log_{\frac{2}{3}}\left(\frac{\sqrt{2}}{2}\right) \end{cases} \quad (0 \leq x \leq \pi)$	$\frac{\pi}{4} < x < \frac{\pi}{2}$
51	$\begin{cases} \ln(x+2) - \ln(x-1) > \ln[2(x-1)] \\ \log( x-1  + 1) > 0 \\ \log_{\frac{1}{11}}(4x+3) > -1 \end{cases}$	$1 < x < 2$