

sistemi di disequazioni esponenziali

1	$\begin{cases} 2x \leq 8 \\ 2^x \leq 8 \end{cases}$	$x \leq 3$
2	$\begin{cases} 5x > 6 \\ 5^x \geq 25 \end{cases}$	$x \geq 2$
3	$\begin{cases} x^2 + 1 > 0 \\ 3^{x+2} < 27 \end{cases}$	$x < 1$
4	$\begin{cases} 4^{x-2} \leq 32 \\ 2x \geq 5 \end{cases}$	$\frac{5}{2} \leq x \leq \frac{9}{2}$
5	$\begin{cases} 7^{3x} > 1 \\ 7x \leq 3 \end{cases}$	$0 < x \leq \frac{3}{7}$
6	$\begin{cases} 2x < 18 \\ 5^x \geq \frac{1}{125} \end{cases}$	$-3 \leq x < 9$
7	$\begin{cases} 2^x > 8 \\ 3^x < 9 \end{cases}$	\emptyset
8	$\begin{cases} 3^x > 27 \\ 2^x > 16 \end{cases}$	$x > 4$

9	$\begin{cases} 4^{2x} \geq 4 \\ 5^{x+1} \leq 25 \end{cases}$	$\frac{1}{2} \leq x \leq 1$
10	$\begin{cases} 7^{2x} \leq 49 \\ 2^{5x} \geq 8 \end{cases}$	$\frac{3}{5} \leq x \leq 1$
11	$\begin{cases} 9^x \leq 27 \\ 3^{2x} \leq 81 \end{cases}$	$x \leq \frac{3}{2}$
12	$\begin{cases} 6^x > 36 \\ 3^{2x} > 81 \end{cases}$	$x > 2$
13	$\begin{cases} 7^x > 49 \\ \left(\frac{\sqrt{3}}{3}\right)^x < \frac{1}{9} \end{cases}$	$x > 4$
14	$\begin{cases} \left(\frac{3}{2}\right)^x > \frac{8}{27} \\ 4^x < \frac{1}{2} \end{cases}$	$-3 < x < -\frac{1}{2}$
15	$\begin{cases} \left(\frac{1}{2}\right)^x \geq \frac{1}{8} \\ \left(\frac{1}{3}\right)^{2x} \geq 9 \end{cases}$	$x \leq -1$
16	$\begin{cases} 4^{-x} > 4^{-1} \\ 9^{x-4} - 3 < 0 \end{cases}$	$x < 1$

17	$\begin{cases} 2^{-x} - \frac{1}{2} < 0 \\ 3^{x+1} < 27 \end{cases}$	$1 < x < 2$
18	$\begin{cases} 3 \cdot 9^{2x+1} > 1 \\ \left(\frac{2}{3}\right)^x > \frac{27}{8} \end{cases}$	\emptyset
19	$\begin{cases} e^{7x-2} > -8 \\ \left(\frac{9}{5}\right)^x \leq \frac{81}{25} \end{cases}$	$x \leq 2$
20	$\begin{cases} 4^x \leq 2^{x-4} \\ 4^{x+5} > 2 \end{cases}$	$-\frac{9}{2} < x \leq -4$
21	$\begin{cases} (7^{x+1})^x > 49 \\ 2 \cdot 2^{x-2} - 4 \geq 0 \end{cases}$	$x \geq 3$
22	$\begin{cases} 3^{7x-2} > 9 \\ \left(\frac{1}{64}\right)^x \leq 4^{-x} \end{cases}$	$x > \frac{4}{7}$
23	$\begin{cases} \left(\frac{1}{2}\right)^x - 2^x \geq 0 \\ \frac{1}{3^x} + \frac{1}{4^x} < 0 \end{cases}$	\emptyset
24	$\begin{cases} \frac{\left(\frac{1}{4}\right)^{-x} - 1}{x - 1} \leq 0 \\ 7^x > 7^{1-x} + 6 \end{cases}$	\emptyset

25	$\begin{cases} e^{x-1} > e^{\frac{x}{7}+5x-3} \\ e^{-2x^2-3x} < e \end{cases}$	$x < -1 \vee -\frac{1}{2} < x < \frac{14}{29}$
26	$\begin{cases} 9 \cdot 3^x > 9^{-1} \\ 3^{x-1} \cdot 3^{x+1} < 9 \end{cases}$	$-4 < x < 1$
27	$\begin{cases} \frac{2^{x-1}}{2^x - 1} \geq 0 \\ \frac{\left(\frac{1}{2}\right)^{-x} - 1}{8 - 2^x} \leq 0 \end{cases}$	$x > 3$
28	$\begin{cases} \left(\frac{1}{2}\right)^{x^2+2x} > \frac{1}{256} \\ \frac{3}{3^x} (x-2)(x+1) < 9^{\frac{(x-1)}{4}} \end{cases}$	$-\frac{1}{2} < x < 2$
29	$\begin{cases} e^{3x^2-4x-6} < e \\ \left(\frac{1}{3}\right)^{\frac{4x-6}{3}} \cdot 3^{-x} > \left(\frac{1}{9}\right)^{\frac{x+1}{2}} \end{cases}$	$-1 < x < \frac{9}{4}$
30	$\begin{cases} \frac{35}{2} 5^{-2x} \geq \frac{7}{10} \cdot 5^x \\ 4^{3(x+1)} < 32^{\frac{2}{x}-1} \end{cases}$	$x < -\frac{5}{2} \vee 0 < x < \frac{2}{3}$
31	$\begin{cases} {}^{x+1}\sqrt{2} < 1 \\ 10^{-x} < 100 \end{cases}$	\emptyset
32	$\begin{cases} 3^{(x-1)(x+1)} > 1 \\ {}^{x+1}\sqrt{2^x} > 1 \end{cases}$	$x > 1 \wedge x \in \mathbb{N}$

33	$\begin{cases} \frac{9}{2^x - 1} - \frac{6}{2^x - 2} < 0 \\ \frac{3^{2x} + 3^x}{9^x - 1} < 0 \end{cases}$	$x < 0$
34	$\begin{cases} 2 \frac{x(x-1)}{x+1} \leq 1 \\ (4 - 2^{2x})(9^x - 1)^2 \leq 0 \end{cases}$	$0, 1$
35	$\begin{cases} 3^{2x^4 + 3x^3 - 4x^2 - 3x} < \frac{1}{9} \\ 2^{4-x} < 16^{x+1} \end{cases}$	$\frac{1}{2} < x < 1$
36	$\begin{cases} \frac{10^{\frac{x^2}{4}}}{10^x} \leq 100^{\frac{21}{8}} \\ \frac{25^{4x}}{5^{x^2}} \leq 5^7 \end{cases}$	$-3 \leq x \leq 1 \vee x = 7$
37	$\begin{cases} e^{\frac{2x^2 - 3x - 2}{4x^2 - 12x + 9}} \geq 1 \\ 8^{\sqrt{x^2 + x + 2}} > 8^{\sqrt{x + 6}} \end{cases}$	$-6 \leq x < -2 \vee x > 2$
38	$\begin{cases} \frac{\sqrt{(4^x \cdot 8^{-x})^3}}{2^{-x} \cdot 2^x} \leq \frac{1}{256} \\ \left(\frac{2}{5}\right)^x - \frac{2}{5} \sqrt{\frac{5}{2}} > 0 \end{cases}$	$x \leq -16$
39	$\begin{cases} 2^{\frac{x+\sqrt{2}}{3}} > 2^{\frac{x+\sqrt{3}}{2}} \\ 2^{3x} \cdot 2^{\sqrt{3}} \geq 4^x \cdot (2)^{1-\sqrt{3}} \end{cases}$	$1 - 2\sqrt{3} \leq x \leq 2\sqrt{2} - 3\sqrt{3}$

sistemi più impegnativi

40	$\begin{cases} e^{2x} > -4 \\ \left(\frac{1}{3}\right)^{x-1} \leq 2 \end{cases}$	$x \geq 1 - \frac{\log 2}{\log 3}$
41	$\begin{cases} \left(\frac{1}{2}\right)^{3x} \geq 2^3 \\ 2^{2x} - 2 \cdot 2^{x-1} + 2^{-2} \leq 0 \end{cases}$	$x = -1$
42	$\begin{cases} (2e)^x \leq e^x \\ 10^x > \frac{1}{1000} \end{cases}$	$-3 < x \leq 0$
43	$\begin{cases} 1 \geq -e^{-x+2} \\ \frac{2}{5} \cdot 5^{x+1} - 5^{2x} < -3 \end{cases}$	$x > \frac{\log 3}{\log 5}$
44	$\begin{cases} 3 \cdot 2^{x-3} - 2^x < 1 \\ \sqrt{2x^2 - \frac{1}{3} - \frac{2}{3}} \geq 0 \end{cases}$	R
45	$\begin{cases} \left(\frac{1}{100}\right)^x - 7\left(\frac{1}{10}\right)^x - 3 \cdot 10 \geq 0 \\ 2^{x+1} + \frac{2^3}{2^x} \geq 17 \end{cases}$	$x \leq -1$

46	$\begin{cases} \left(\frac{2}{3}\right)^x - \frac{27}{8} \cdot \sqrt{\frac{3}{2}} < 0 \\ 34\left(\frac{3}{5}\right)^x - 9 \leq 25\left(\frac{3}{5}\right)^{2x} \end{cases}$	$-\frac{7}{2} < x \leq 0 \vee x \geq 2$
47	$\begin{cases} 3^x + 3^{x+2} \leq 3^{x-1} + 87 \\ 5^{\frac{2}{x}} - \frac{26}{25} 5^{\frac{1}{x}} + \left(\frac{1}{5}\right)^2 > 0 \end{cases}$	$-\frac{1}{2} < x < 0 \vee 0 < x \leq 2$
48	$\begin{cases} 2^{x+1} + \frac{1}{3^{-x}} > -3 \\ \frac{2^x}{2^{2x-1}} < 8\sqrt{2^{x^2-3}} \end{cases}$	$R - \{-1\}$
49	$\begin{cases} (5^{3x} - 5^{2x}) \left(e^{\frac{1}{x}} - e^2\right) < 0 \\ 2^{-2x} - 1 \geq -3 \left(\frac{1}{2}\right)^{x+1} \end{cases}$	$\frac{1}{2} < x \leq 1$
50	$\begin{cases} (2^x + 1)(3^x - 1) > 0 \\ \left(\frac{1}{3}\right)^{x-1} + \left(\frac{1}{3}\right)^{1-x} \leq 2 \end{cases}$	1

51	$\begin{cases} 25^{x+1} > \sqrt{\frac{5^x \cdot 5^{1-x}}{25}} \\ \frac{e^{2x}}{\left(\frac{1}{e}\right)^{-x} - 1} < 0 \end{cases}$	$-\frac{7}{2} < x < 0$
52	$\begin{cases} \frac{3^2 \cdot 3^{-x}}{9^x + 3^{2x}} - \frac{27}{2} > 0 \\ \frac{1}{2^{3x} - 2} < \frac{2^{3x}}{2(8^x - 4)} \end{cases}$	$x < -\frac{1}{3}$
53	$\begin{cases} \frac{3^{-x} - 9^2}{\frac{x+2}{5^x} - 5^2} \leq 0 \\ \frac{10^x}{10^{2x} - 1} < \frac{3}{1 - 10^x} \end{cases}$	$x \leq -4$
54	$\begin{cases} \left \frac{25^x - 1}{25^x + 1} \right < 1 \\ \frac{3^x - 4}{3^{2x} - 4} \geq \frac{2}{3^x + 2} \end{cases}$	$x < \log_3 2$
55	$\begin{cases} \frac{5^{x^2-4x} - 1}{x - 2} > 0 \\ \left \frac{\left(\frac{1}{4}\right)^x}{2^{x+2} : 64} \right < 1 \end{cases}$	$\frac{4}{3} < x < 2 \vee x > 4$

56	$\begin{cases} \left(\frac{3}{4}\right)^{x(x-3)} \leq \left(\frac{4}{3}\right)^2 \\ 2^{-\sqrt{x^2-3}} \cdot \sqrt[x]{4} \geq 1 \end{cases}$	2
57	$\begin{cases} (e^x - 2) \left(-\frac{1}{e^x} - 1\right) \geq 0 \\ 1 - \frac{2}{3e^{2x} - 5e^x} \leq 0 \end{cases}$	$\log \frac{5}{3} < x \leq \log 2$
58	$\begin{cases} \frac{3^x - 9^2}{(2^{2(2x+1)} - 32)\sqrt{5^{\frac{x^2-3}{2}} - 125}} < 0 \\ 2 \cdot 2^{-x} - 2^x \leq 1 \end{cases}$	$3 < x < 4$
59	$\begin{cases} \frac{(x^4 - 2^4) \left(\frac{1}{3}\right)^{x-4}}{\left(\frac{1}{5}\right)^{x-1} - 5^{2x}} \leq 0 \\ \frac{7^2 \sqrt{x(2x-1)}}{(3^{2x} - 10 \cdot 3^x + 3^2)^{\frac{1}{2}}} \geq 0 \end{cases}$	$-2 \leq x < 0 \vee x > 2$
60	$\begin{cases} a^{ x^2-4 } > a^5 \\ \frac{(a^3)^{ x+2 }}{a^{x x+1 }} > a^{2x} \\ \frac{\sqrt{a^x} \cdot a^{2x+3}}{a^{1-x}} < \frac{a^{x-6}}{a^2} \end{cases} \quad (0 < a < 1)$	$\sqrt{6} < x < 3$