Disequazioni esponenziali

PASSED

disequazioni esponenziali risolubili mediante applicazioni delle proprietà delle potenze		
1	$3^x > 81$	$x > 4$
2	$5^x > 25$	$x > 2$
3	$5^x \geq \frac{1}{25}$	$x \geq -2$
4	$2^x > \frac{1}{64}$	$x > -6$
5	$\left(\frac{1}{25}\right)^x > 625$	$x < -2$
6	$\left(\frac{1}{49}\right)^x < 343$	$x > -\frac{3}{2}$
7	$1 - 5^{2+x} \geq 0$	$x \leq -2$
8	$\left(\frac{1}{7}\right)^{3x+2} < 49$	$x > -\frac{4}{3}$
9	$\left(\frac{1}{4}\right)^x < 0$	$\emptyset$
10	$2^{9x+5} > 2^{x-7}$	$x > -\frac{3}{2}$
11	$\left(\frac{2}{3}\right)^{\frac{x}{2}} - \frac{9}{4} > 0$	$x < -4$
12	$3^{2x} - 1 < 0$	$x < 0$
13	$2^{3x} - 4 > 0$	$x > \frac{2}{3}$
14	$\left(\frac{1}{2}\right)^x \leq -1$	$\emptyset$

15	$\left(\frac{1}{2}\right)^{2x} - 8 < 0$	$x > -\frac{3}{2}$
16	$5^{3x} + 1 > 0$	R
17	$\left(\frac{1}{5}\right)^{\sqrt{x}} > 25$	$\emptyset$
18	$5^{-2x^2+x+2} < 5^{(2-x)^2}$	$x < \frac{2}{3} \quad \vee \quad x > 1$
19	$4^{2x^2+1} - 16 > 0$	$x < -\frac{\sqrt{2}}{2} \quad \vee \quad x > \frac{\sqrt{2}}{2}$
20	$\left(\frac{2}{3}\right)^{x^2+2} - \left(\frac{27}{8}\right)^{x} < 0$	$x < -2 \quad \vee \quad x > -1$
21	$16^{x^2+x} < 4$	$-\frac{\sqrt{3}+1}{2} < x < \frac{\sqrt{3}-1}{2}$
22	$3^{\sqrt{x^2-9}} \geq 1$	$x \leq -3 \quad \vee \quad x \geq 3$
23	$\left(\frac{1}{2}\right)^{\sqrt{3x-2}} > 4^{1-x}$	$x > 2$
24	$2^{\sqrt{6x-x^2}} < 2^{3-2x}$	$0 \leq x < \frac{3}{5}$
25	$5^{\frac{2x-1}{2}} - \left(\frac{1}{25}\right)^{\frac{x+4}{x}} > 0$	$x > 0$
26	$\left(\frac{1}{4}\right)^{-\frac{x}{x+1}} - 16^{\frac{x}{x-1}} < 0$	$x < -3 \quad \vee \quad -1 < x < 0 \quad \vee \quad x > 1$
27	$3^{\frac{2x^2-3}{2x-1}} - \frac{1}{3} < 0$	$x < -2 \quad \vee \quad \frac{1}{2} < x < 1$
28	$\frac{2^{3x}}{4^{x+1}} - \left(\frac{1}{2}\right)^{x} > 0$	$x > 1$

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29	$\frac{5^{2-x}}{125^{\frac{1}{x}}} < \left(\frac{1}{25}\right)^{x}$	$x < -3 \quad \vee \quad 0 < x < 1$
30	$\sqrt[3]{2^{6x}} < \frac{1}{4}16^{x^2-1}$	$x < -1 \quad \vee \quad x > \frac{3}{2}$
31	$54 \cdot 3^{2x} \leq 36 \cdot 4^{x}$	$x \leq \frac{1}{2}$
32	$1 \leq 3^{2x-1} \leq 9$	$\frac{1}{2} \leq x \leq \frac{3}{2}$
33	$-\frac{1}{2} \leq 4^{x} \leq 16^{\frac{1}{x}}$	$x \leq -\sqrt{2} \quad \vee \quad 0 < x \leq \sqrt{2}$
34	$\sqrt{3^{x}} \leq \left(\frac{1}{9}\right)^{\frac{1}{x^2}} \leq \frac{1}{3}$	$\emptyset$
35	$\left(3^{\frac{2}{3}x} - 9\right)(2^{-x} + 1) > 0$	$x > 3$
36	$\frac{2^{-3x^2} - \frac{1}{2}}{3^{x} - 1} \geq 0$	$x \leq -\frac{\sqrt{3}}{3} \quad \vee \quad 0 < x \leq \frac{\sqrt{3}}{3}$
37	$\frac{\left(\frac{1}{4}\right)^{x}(3^{2x} - 27)}{8^{x}} < 0$	$x < \frac{3}{2}$
38	$\frac{\left(\left(\frac{1}{2}\right)^{\sqrt{x}} - 1\right)(3^{3x^2} - 27)}{2^{3x-4} - \frac{1}{4}} > 0$	$\frac{2}{3} < x < 1$
	disequazioni esponenziali risolubili mediante una variabile ausiliaria	
39	$9^{x} - 3^{x} \leq 0$	$x \leq 0$
40	$3^{2x} - 3^{x-1} \geq 0$	$x \geq -1$
41	$3^{3-x} - \left(\frac{1}{3}\right)^{\frac{x-2}{2}} < 0$	$x > 4$

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42	$25^x + 5^x - 30 < 0$	$x < 1$
43	$3^{2x} - 10 \cdot 3^x + 9 < 0$	$0 < x < 2$
44	$2^{2x} - 10 \cdot 2^x + 16 < 0$	$1 < x < 3$
45	$5^{2x} - 26 \cdot 5^x + 25 < 0$	$0 < x < 2$
46	$2^{2x} - 3 \cdot 2^x + 2 > 0$	$x < 0 \vee x > 1$
47	$32 \cdot \left(\frac{1}{2}\right)^{2x} < 1 + 4 \cdot \left(\frac{1}{2}\right)^{x}$	$x > 2$
48	$\left(\frac{1}{2}\right)^{2x} - 3\left(\frac{1}{2}\right)^{x} - 4 > 0$	$x < -2$
49	$5^{x+2} + 25^{x+1} > 750$	$x > 1$
50	$3^x + 3^{x+2} - 3^{x-1} < 87$	$x < 2$
51	$4^{x+1} - 17 \cdot 2^x + 4 > 0$	$x < -2 \vee x > 2$
52	$\left(\frac{1}{3}\right)^{2x-3} - 4 \cdot \left(\frac{1}{3}\right)^{x-1} + 1 \leq 0$	$1 \leq x \leq 2$
53	$4^{-x} + \left(\frac{1}{2}\right)^{x} - 2 > 0$	$x < 0$
54	$\left(\frac{1}{49}\right)^{x} - 6 \cdot 7^{-x} - 7 \leq 0$	$x \geq -1$
55	$3^x - 2\left(\sqrt{3}\right)^{x} - 3 > 0$	$x > 2$

56	$4^x - 2^{x+1} + 1 > 0$	$x \neq 0$
57	$4^{-x^2} - 7\left(\frac{1}{2}\right)^{x^2} - 8 \geq 0$	$\emptyset$
58	$\left(\frac{1}{3}\right)^{\frac{x+1}{2}} - 7\left(\frac{1}{3}\right)^{\frac{x+1}{4}} - 18 < 0$	$x > -9$
59	$4^{2x} - 15\left(\frac{1}{2}\right)^{-2x} - 16 \leq 0$	$x \leq 2$
60	$\frac{3^x - 1}{9 - 3^x} \leq 0$	$x \leq 0 \vee x > 2$
61	$\frac{5^x - 3}{5^x + 2} < 5^x + 1$	R
62	$(7^x + 7)(7^x + 2) \geq 0$	R
63	$\frac{3^{2x} - 3^x}{3^{2x} + 3^x} \geq 0$	$x \geq 0$
64	$\frac{2^x - 1}{2^x - 2} > 0$	$x < 0 \vee x > 1$
65	$\frac{2^x - 1}{2^x + 1} - 2^x > 0$	$\emptyset$
66	$\frac{3^{2x} + 1}{1 - 3^x} + 2 > 0$	$x < 0$
67	$\frac{2^{x-1} - 2^{\frac{x+1}{2}} - 8}{9^x - 4 \cdot 3^x + 3} > 0$	$0 < x < 1 \vee x > 5$
68	$\frac{3^{1-2x} - 10\left(\frac{1}{3}\right)^x + 3}{\sqrt{3^{x-1}} + 1} > 0$	$x < -1 \vee x > 1$

69	$\frac{\left(\frac{1}{5}\right)^{2(x^2-2)} - 126\left(\frac{1}{5}\right)^{x^2-1} + 5}{(3^x+2)(9^x-3^x)} \leq 0$	$x \leq -\sqrt{3} \vee 0 < x \leq \sqrt{3}$
	disequazioni esponenziali risolubili mediante l'uso di logaritmi	
70	$2^x \geq 6$	$x \geq log_2 6$
71	$\left(\frac{1}{9}\right)^x > 5^x$	$x < 0$
72	$5^{2x} > 7^x$	$x > 0$
73	$\left(\frac{1}{2}\right)^x \leq 7$	$x \geq log_2 \frac{1}{7}$
74	$3^x > 2$	$x > \frac{ln\,2}{ln\,3}$
75	$2^{3x} \leq 5$	$x \leq \frac{ln\,5}{3\,ln\,2}$
76	$\left(\frac{1}{3}\right)^{x+1} > 4$	$x < -\left(1 + \frac{ln\,4}{ln\,3}\right)$
77	$\left(\frac{1}{2}\right)^x - 3 < 0$	$x > -\frac{ln\,3}{ln\,2}$
78	$2^{2+x} > 3^x$	$x < \frac{2}{log_2 3 - 1}$
79	$3^{2x} > 3 \cdot 7^x$	$x > \frac{ln\,3}{ln\,9 - ln\,7}$
80	$\frac{1}{7^x} > 100^{1-2x}$	$x > \frac{2}{4 + Log\,7}$
81	$\sqrt{3}\left(\frac{1}{5}\right)^{2x} \leq \sqrt{21}$	$x \geq -\frac{1}{4}\frac{ln\,7}{ln\,5}$

82	$3^{\frac{x-1}{2}} + 2 < 0$	$\emptyset$
83	$27^x \cdot 5^{3x-2} < 9^{x+1}$	$x < \frac{2\,ln\,15}{ln\,375}$
84	$3^{x+2} - 5^x \geq 3^x$	$x \leq \frac{ln\,8}{ln\,5 - ln\,3}$
85	$3^{2x} - 3^{x+1} + 2 < 0$	$0 < x < \frac{ln\,2}{ln\,3}$
86	$7 \cdot 2^{2x} + 20 \cdot 2^x - 3 > 0$	$x > -\frac{ln\,9}{ln\,2}$
87	$9^x - 3^{x+1} + 2 < 0$	$0 < x < log_3\,2$
88	$3^{2x} - 5 \cdot 3^x + 6 \geq 0$	$x \leq log_3 2 \quad \vee \quad x \geq 1$
89	$2^x + 3 \cdot 2^{1-x} \geq 5$	$x \leq 1 \quad \vee \quad x \geq \frac{log3}{log2}$
90	$3^{2x} - 6 \cdot 3^x - 6 \cdot 3^{-x} + 11 > 0$	$0 < x < \frac{ln\,2}{ln\,3} \quad \vee \quad x > 1$
91	$3 \cdot 5^x + 5 \cdot 3^{2x} < 2 \cdot 9^{x+1}$	$x > \frac{ln\,13 - ln\,3}{ln\,5 - ln\,9}$
92	$3(e^{2x} - 3^x) > e^{2x} + 5 \cdot 3^x$	$x > \frac{ln\,4}{2 - ln\,3}$
93	$20 \cdot 3^x - 2^x > 2 \cdot 3^x + 2^{x+1}$	$x > \frac{ln\,6}{ln\,2 - ln\,3}$
94	$10^{\sqrt{2x+4}} > 4^x$	$-2 \leq x < \frac{1 + \sqrt{1 + 4\,Log^2\,4}}{Log^2\,4}$
95	$7 - 4^{\frac{x}{2}-1} \leq 0$	$x \geq 2\left(\frac{ln\,7}{ln\,4} + 1\right)$

96	$2^{x-1} > \frac{1}{2\sqrt[5]{3}}$	$x > -\frac{\ln 3}{5 \ln 2}$
97	$\left(\frac{2}{3}\right)^{2x-1} > \frac{10}{\sqrt{2}}$	$x < \frac{1}{2}\left(1 + \frac{1}{2}\frac{2 \ln 10 - \ln 2}{\ln 2 - \ln 3}\right)$
98	$2^x > \frac{7}{3^{2x+1}}$	$x > \frac{\ln 7 - \ln 3}{\ln 18}$
99	$\sqrt{3^{2x+4}} > 2^x$	$x > -\frac{\ln 9}{\ln 3 - \ln 2}$
100	$\left(\frac{1}{\sqrt{2}}\right)^{x-4} \geq 3^{x+1}$	$x \leq \frac{\ln 16 - \ln 9}{\ln 18}$
101	$2^{3x-1} - \sqrt{7} \cdot 7^x > 0$	$x > \frac{\ln 28}{\ln 64 - \ln 49}$
102	$\frac{2^{x-1} \cdot \sqrt{3}^{x+1}}{3} < \left(\frac{1}{2}\right)^x$	$x < \frac{\ln 12}{\ln 48}$
103	$2^{x+1} \leq 3^{-x} \leq 2 \cdot 5^{\frac{x+2}{3}}$	$-\frac{3 \ln 2 + 2 \ln 5}{3 \ln 3 + \ln 5} \leq x \leq -\frac{\ln 2}{\ln 2 + \ln 3}$
104	$5 \cdot \left(\frac{1}{2}\right)^{2x-1} < 9^{x+\frac{1}{2}} < 4^{-x-1}$	$\emptyset$
105	$\frac{3^{2x-1} - 4^x}{6^{\sqrt{x}} - 2} > 0$	$0 \leq x < \left(\frac{\ln 2}{\ln 6}\right)^2 \quad \vee \quad x > \frac{\ln 3}{\ln 9 - \ln 4}$
106	$\frac{2^{3x-1} \cdot 5^{-x}}{3^{2x+3}} > \frac{1}{2}$	$x < -\frac{3 \ln 3}{\ln 45 - \ln 8}$
107	$\frac{2^{x-1}\sqrt{5}}{\left(\sqrt{10}\right)^x} \geq 5^{1-x}$	$x \geq \frac{\ln 20}{\ln 10}$
108	$\frac{3^{-2x-1} + \sqrt{9^{1-2x}}}{2^{x+3} + 2^{x-3}} > 2$	$x < -\frac{\ln 39 - \ln 8}{\ln 18}$
109	$\frac{\left(3 \cdot 4^{x-\sqrt{2}} + 1\right)\left(5^{\frac{2x-1}{3}} - 3^x\right)}{\sqrt{2} \cdot 2^{x+2} - 3^{-x}} < 0$	$x < -\frac{\ln 5}{\ln 27 - \ln 25} \quad \vee \quad x > -\frac{5 \ln 2}{\ln 36}$

disequazioni esponenziali di riepilogo più impegnative

110	$3^{\frac{2}{x}} - 3^{\frac{1}{x}} + 1 > 0$	$x \neq 0$
111	$\left(\frac{1}{3}\right)^{(x-2)^2} < \left(\frac{1}{3}\right)^{4(x-3)}$	$x \neq 4$
112	$3^x - 2\left(\frac{1}{3}\right)^x \geq -1$	$x \geq 0$
113	$\left(\frac{1}{7}\right)^{\sqrt{x^2-x}} \geq \left(\frac{1}{7}\right)^{\sqrt{2}}$	$-1 \leq x \leq 0 \quad \vee \quad 1 \leq x \leq 2$
114	$3^{\sqrt{x^2-9}} \geq 0$	$x \leq -3 \quad \vee \quad x \geq 3$
115	$2^{4(x+1)} - 25 \cdot 2^{2x} + 9 \geq 0$	$x \leq log_2 3 - 2 \quad \vee \quad x \geq 0$
116	$49^x + \frac{1}{7^{2x}} \leq 2$	$\emptyset$
117	$3^{-2x+1} - 4\left(\frac{1}{3}\right)^x + 1 \leq 0$	$0 \leq x \leq 1$
118	$3^{2-x} > \sqrt{\left(\frac{1}{3}\right)^{x-4} \cdot 9^{-x}}$	$x > 0$
119	$\left(\frac{1}{2}\right)^{x^2-2} \cdot 4 < 8^{3-x}$	R
120	$\frac{4 \cdot 2^x}{\frac{1}{2} - 1} + 8^x < 0$	$x < \frac{3}{2}$
121	$3^x - 4^{x+1} > 0$	$x < -\frac{ln\,4}{ln\,4 - ln\,3}$
122	$a^{\sqrt{4-x}} > a^{3x-2} \qquad a > 0$	$x < \frac{11}{9}$

123	$\sqrt[4]{3^{3x-2}} > \sqrt[3]{3^{x-2}}$	$x > -\frac{2}{5}$
124	$\left(\frac{e}{2}\right)^{2x-1} - 2\left(\frac{e}{2}\right)^{\frac{2x-1}{2}} + 1 > 0$	$x \neq \frac{1}{2}$
125	$\frac{3^{2x-1} \cdot 2^x}{5} > \left(\frac{1}{3}\right)^{-x}$	$x > \frac{ln\,15}{ln\,6}$
126	$\left(\frac{1}{10}\right)^{\frac{2}{x-1}} > 3^{2(x+1)}$	$x < 1$
127	$\left(\frac{1}{2}\right)^{\sqrt{2x^2+7x-4}} - 8^{2x+1} > 0$	$x \leq -4$
128	$3^{2x} - \sqrt{3} \cdot 2^x > 0$	$x > \frac{ln\,3}{ln\,81 - ln\,4}$
129	$3^{x+1} + 2^{x+1} \leq 3^x + 5 \cdot 2^x$	$x \leq 1$
130	$3 \cdot 5^x - 13 \cdot 3^{2x} < 0$	$x > \frac{ln\,13 - ln\,3}{ln\,5 - ln\,9}$
131	$2^{x-2} - 7^{2x+1} < 0$	$x > \frac{ln\,28}{ln\,2 - log\,49}$
132	$3^{\frac{x+1}{x}} \cdot 6 > 2^{\frac{2x+1}{x}}$	$x < -\frac{ln\,3 - ln\,2}{ln\,9 - ln\,2} \quad \vee \quad x > 0$
133	$5^{\frac{3x-2}{3}} \cdot \left(\frac{1}{2}\right)^x > 2^{1+x}$	$x > \frac{ln\,200}{ln\,125 - ln\,64}$
134	$\frac{2^x \cdot 5 - 5^x}{\sqrt{2^{x-1}}} < 0$	$x > \frac{ln\,5}{ln\,5 - ln\,2}$
135	$\frac{3^{2-x} - 3^{-x}}{9^x - 3^{2x+1}} < 3^{4+9x}$	R
136	$\frac{\sqrt[2x-1]{4^{3x}}}{\sqrt{2^{x-1}}} > \frac{4}{\sqrt[x-6]{8^{x+6}}}$	$x < 3 \quad \vee \quad 6 < x < 18$

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137	$\frac{5^x+1}{5^{2x}-2}<1$	$x<\frac{ln\,2}{2\,ln\,5} \quad \vee \quad x>\frac{ln\,(\sqrt{13}+1)}{ln\,5}-\frac{ln\,2}{ln\,5}$
138	$\frac{3\cdot 3^x}{5^{x+1}}>2$	$x<-\frac{ln\,10-ln\,3}{ln\,5-ln\,3}$
139	$\frac{2\cdot 5^{3+2x}}{9^x}>\sqrt{2}$	$x>-\frac{1}{4}\,\frac{6\,ln\,5+ln\,2}{ln\,5-ln\,3}$
140	$7^{\left(\frac{1}{25^x}-\frac{2}{5^x-25^x}\right)}>7^{\frac{1}{(5^x-1)^2}}$	$x<\frac{ln(1+\sqrt{2}/2)}{ln\,5} \quad \vee \quad x>\frac{ln(1+\sqrt{2}/2)}{ln\,5}$
141	$\sqrt{2^{3x+1}}+3^{2x+1}\geq 3^{2x}+\sqrt{2^{3x+2}}$	$x\geq\frac{ln\,2-ln(2-\sqrt{2})}{\frac{3}{2}ln\,2-2\,ln\,3}$
142	$x^{\sqrt{x+1}}>0$	$x>0$
143	$\left(\frac{1}{2}\right)^{\frac{\lvert x+1\rvert}{1-x}}-4>0$	$1<x<3$
144	$5^{\left\lvert\frac{2x+1}{3-x}\right\rvert}<5$	$-4<x<\frac{2}{3}$
145	$\left(\left(\frac{1}{2}\right)^{2x-1}+4\right)(3^{2x+2}-2\cdot 3^{x+1}-3)\leq 0$	$x\leq 0$
146	$\frac{(3^{x^2-1}-9)(7^{x+1}-4^{2x})}{\left(\frac{1}{2}\right)^{\frac{x(x-1)}{2}}-4^x}\geq 0$	$-3<x\leq-\sqrt{3} \ \vee\ 0<x\leq\sqrt{3} \ \vee x\geq\frac{ln\,7}{ln\,16-ln\,7}$