

Disequazioni logaritmiche intere

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Gli esercizi sono proposti in ordine di difficoltà crescente.

nota: in un file così lungo e complesso può accadere che sia presente un errore di diversa natura nonostante gli esercizi siano stati controllati più volte. Saremo grati di ricevere segnalazioni di eventuali refusi o suggerimenti di qualsiasi natura.

1. risolvere le seguenti disequazioni utilizzando la definizione ed i teoremi sui logaritmi 

1	$\log x > 0$	$x > 1$
2	$\log x \leq 0$	$0 < x \leq 1$
3	$\log x > 1$	$x > 10$
4	$\log x \leq 1$	$0 < x \leq 10$
5	$\ln x > 0$	$x > 1$
6	$\ln x > 1$	$x > e$
7	$\log_3 x < 2$	$0 < x < 9$
8	$\log_{\frac{1}{3}} x > 0$	$0 < x < 1$
9	$\log_2 x < 0$	$0 < x \leq 1$
10	$\log_{\frac{1}{3}} x > 2$	$0 < x < \frac{1}{9}$
11	$\log_9 x \leq 10$	$0 < x \leq 9^{10}$
12	$\log_{\frac{1}{2}} x > -1$	$0 < x < 2$
13	$\log_3 x \leq 1$	$0 < x \leq 3$
14	$\log_5 x > 2$	$x > 25$

15	$\log_1 x \geq 9$	\emptyset
16	$\log_0 x > 4$	\emptyset
17	$\log_{-6} x < 6$	\emptyset
18	$\log_{\frac{1}{2}} x \leq 3$	$x \geq \frac{1}{8}$
19	$\log_{\frac{1}{3}} x > 4$	$0 < x < \frac{1}{81}$
20	$\log_{\frac{1}{10}} x < -3$	$x > 10^3$
21	$\log_5 x < \frac{1}{2}$	$0 < x < \sqrt{5}$
22	$\log_{\frac{1}{3}} x > \frac{1}{2}$	$0 < x < \frac{\sqrt{3}}{3}$
23	$\log_{\frac{1}{5}} x \leq -\frac{1}{3}$	$x \geq \sqrt[3]{5}$
24	$\log_{\frac{1}{4}} x \geq -4$	$0 < x \leq 4^4$
25	$\log_{100} x > -\frac{1}{2}$	$x > \frac{1}{10}$
26	$\log_{0,09} x \leq \frac{1}{2}$	$x \geq \frac{3}{10}$
27	$\log_{\frac{27}{125}} x < -\frac{1}{3}$	$x > \frac{5}{3}$
28	$\log_{\frac{32}{3}} x \geq -\frac{1}{5}$	$x \geq \frac{\sqrt[5]{3}}{2}$

29	$\log_{0,0016} x \geq \frac{1}{4}$	$0 < x \leq \frac{1}{5}$
30	$\log_{\frac{3}{4}} x < -\frac{2}{3}$	$x > \frac{2\sqrt[3]{6}}{3}$
31	$\log_{\frac{7}{6}} x \leq -\frac{3}{2}$	$0 < x \leq \frac{6\sqrt{42}}{49}$
32	$\ln 2x \leq 3$	$0 < x \leq \frac{e^3}{2}$
33	$2 \log x \geq 1$	$x \geq \sqrt{10}$
34	$\log_2 2x > \frac{1}{2}$	$x > \frac{\sqrt{2}}{2}$
35	$\ln x^2 < 1$	$-\sqrt{e} < x < \sqrt{e} \wedge x \neq 0$
36	$\log_{\frac{2}{3}} 2x^2 \leq 2$	$x \leq -\frac{\sqrt{2}}{3} \vee x \geq \frac{\sqrt{2}}{3}$
37	$\log_{\frac{1}{3}} x + 3 > 0$	$0 < x < 27$
38	$\log_{\frac{1}{3}}(x + 3) > 0$	$-3 < x < -2$
39	$\ln(x - 1) \geq 2$	$x \geq 1 + e^2$
40	$\log_3(1 - 2x) \leq 2$	$-4 \leq x < \frac{1}{2}$
41	$\log_{\frac{4}{3}}(1 - 7x) > -2$	$x < \frac{1}{16}$
42	$\ln(x + 1) < 0$	$-1 < x < 0$

43	$\log_2(3x + 1) - 1 > 0$	$x > \frac{1}{3}$
44	$\ln(x + 2) < 0$	$-2 < x < -1$
45	$\ln(x + 1) \geq -2$	$x \geq \frac{1}{e^2} - 1$
46	$\log_3(2x - 1) < -1$	$\frac{1}{2} < x < \frac{2}{3}$
47	$\log_{\frac{1}{2}}(x - 2) \geq 0$	$2 < x \leq 3$
48	$\log_4(3x - 4) > -\frac{3}{2}$	$x > \frac{11}{8}$
49	$\log_2(x - 1) \leq 3$	$1 < x \leq 9$
50	$2 - \log_3(3x - 7) > 0$	$\frac{7}{3} < x < \frac{16}{3}$
51	$2 \log_2(x + 1) - 1 \leq 0$	$-1 < x \leq \sqrt{2} - 1$
52	$\log_{\frac{3}{2}} \frac{x - 2}{3} > -2$	$x > \frac{10}{3}$
53	$\log_5(x^2 + x + 1) \geq 1$	$x < \frac{-1 - \sqrt{17}}{2} \vee x > \frac{-1 + \sqrt{17}}{2}$
54	$\sqrt{1 + \log_{\sqrt{2}} x} \leq 3$	$\frac{\sqrt{2}}{2} \leq x \leq 16$
55	$\log_{0,01}(\sqrt{x + 1} + 2) \leq -\frac{1}{2}$	$x \geq 63$
56	$\log_6(x^2 - x) \leq 1$	$-2 \leq x < 0 \vee 1 < x \leq 3$

57	$\log \frac{x-5}{x+7} > 0$	$x < -7$
58	$\log_{\frac{1}{3}} \sqrt{x^2-1} < 0$	$x < -\sqrt{2} \vee x > \sqrt{2}$
59	$\log_5(x^2-11) - 2 < 0$	$-6 < x < -\sqrt{11} \vee \sqrt{11} < x < 6$
60	$\log_3(1-x^2) \leq -1$	$-1 < x \leq -\sqrt{\frac{2}{3}} \vee \sqrt{\frac{2}{3}} \leq x < 1$
61	$\ln(x^2-x) > 1$	$x < \frac{1-\sqrt{1+4e}}{2} \vee x > \frac{1+\sqrt{1+4e}}{2}$
62	$\log_{\frac{1}{3}}(x^2-x) > \log_{\frac{1}{3}}6$	$-2 < x < 0 \vee 1 < x < 3$
63	$\log_4(2x-1) < \log_4 x$	$\frac{1}{2} < x < 1$
64	$\log_2(x-1) + \log_2 x < 0$	$1 < x < \frac{1+\sqrt{5}}{2}$
65	$\log(x-3) - \log(2x+1) > 0$	\emptyset
66	$2 \ln 2 - \ln(x+1) < 0$	$x > 3$
67	$\log_2 \frac{x-1}{x+1} > 1$	$-3 < x < -1$
68	$\log_{\frac{1}{5}}(2x+2) < \log_{\frac{1}{5}} x$	$x > 0$
69	$\log \frac{x+3}{x-1} > 1$	$1 < x < \frac{13}{9}$
70	$\ln(x-2) > \ln(x+3)$	\emptyset

71	$\log_{\frac{1}{4}}(3-x) > \log_{\frac{1}{4}}(2x+6)$	$-1 < x < 3$
72	$2 \ln x - 2 \ln(x+2) > 0$	\emptyset
73	$\log_{\frac{1}{3}}(2-x) > \log_{\frac{1}{3}}(1-2x)$	$x < -1$
74	$\log_3(x+4) > \log_3(2-x)$	$-1 < x < 2$
75	$\log_3(x-1) \leq \frac{1}{2} \log_3 x$	$1 < x \leq \frac{3+\sqrt{5}}{2}$
76	$\ln x < 2 \ln 2x$	$x > \frac{1}{4}$
77	$\log_2(x^2 + 4x + 3) - \log_2(x + 1) \geq 0$	$x > -1$
78	$2 \log_{\frac{1}{2}}(x-1) - \log_{\frac{1}{2}} x^2 \geq 0$	$x > 1$
79	$\ln(3x+3) \leq \ln(x^2 - 4x - 5)$	$x \geq 8$
80	$\log_2(2x^2 + 3) < \log_2(x + 4)$	$\frac{1-\sqrt{5}}{4} < x < \frac{1+\sqrt{5}}{4}$
81	$\log_5(x^2 - 5x + 6) < \log_5(x + 4)$	$3 - \sqrt{7} < x < 2 \vee 3 < x < 3 + \sqrt{7}$
82	$\log_3 \sqrt{x^2 - x} > \log_3 \sqrt{2}$	$x < -1 \vee x > 2$
83	$\log_5 \sqrt{x-3} \geq \frac{1}{2} \log_5(3x-4)$	\emptyset
84	$\log \frac{x^2 - 1}{x} \geq \log 2$	$x < 1 - \sqrt{2} \vee x > 1 + \sqrt{2}$

85	$\log(3x - 5) + \log(x - 2) \geq \log 2$	$x \geq \frac{8}{3}$
86	$\log(x - 2) - \log(x - 1) < \log 5$	$x > 2$
87	$2\log_2 x \leq 2 + \log_2(x + 3)$	$0 < x \leq 6$
88	$\log(x - 2) + \log 5 < \log x$	$2 < x < \frac{5}{2}$
89	$\ln 2x + \ln \frac{x}{2} < \ln 4$	$0 < x < 2$
90	$\ln 2 + \ln x < 2 \ln(4x - 15)$	$x > \frac{9}{2}$
91	$\log 5 - \log(2x - 3) \geq 1$	$\frac{3}{2} < x \leq \frac{7}{4}$
92	$\ln x + \ln 3 > \ln(x^2 + 2)$	$1 < x < 2$
93	$\log x + \log\left(\frac{1}{x} - x\right) < 0$	$0 < x < 1$
94	$\log_3(3x + 1) - \log_3 x > 2$	$0 < x < \frac{1}{6}$
95	$1 + \log_3 x - \frac{1}{2} \log_3(10x - 1) \geq 0$	$\frac{1}{10} < x \leq \frac{1}{9} \vee x > 1$
96	$\log_2(3x - 1) + \log_2 2 > 1$	$x > \frac{2}{3}$
97	$\ln(x^2 - 4) \leq \ln(x + 2) + 1$	$2 < x \leq 2 + e$
98	$\log_3(x^2 + 3x - 16) - \log_3(x + 3) > 1$	$x > 5$

99	$\log 4 + \log x - \log 7 \leq 0$	$0 < x \leq \frac{7}{4}$
100	$\ln x + \ln 3 < \ln x^2$	$x > 3$
101	$\frac{1}{2} \log(3x - 1) + \log 3 > -\log 0,1$	$x > \frac{109}{27}$
102	$\ln 7 - \ln 4x + 2 \ln x < 1 - \ln x + \ln 2$	$0 < x < 2\sqrt{\frac{2e}{7}}$
103	$\ln(x^2 + 12x + 5) > \ln 2 + \ln(x - 10)$	$x > 10$
104	$\log_{\frac{1}{3}} x - \log_{\frac{1}{3}}(x - 2) - 2 \log_{\frac{1}{3}} 3 \geq 0$	$x \geq \frac{9}{4}$
105	$\ln \frac{x}{x+7} + \ln(x+7) > \ln x$	\emptyset
106	$\log_{\sqrt{2}}(1+x^2) - \log_{\sqrt{2}}(x+2) - 2 \geq 0$	$-2 < x \leq -1 \vee x \geq 3$
107	$\ln(28 - x^3) - \ln(7 - x) < 2 \ln(4 - x)$	$x < 2 \vee \frac{14}{5} < x < \sqrt[3]{28}$
108	$\log(x-1) - 2 \log(x+1) - \log 8 < -2$	$1 < x < \frac{3}{2} \vee x > 9$
109	$\ln(x-2) - \ln 3 \leq \ln(5-x) - \ln 2$	$2 < x \leq \frac{19}{5}$
110	$\log_2(x^2 + x + 1) > \log_2 7 - \log_2(x-1)$	$x > 2$
111	$\ln(4x+5) + \ln(x-2) < \ln 3 + \ln(5-x)$	$2 < x < \frac{5}{2}$
112	$\ln 10 - \ln(x-1) > \ln 8 - \ln(x+3)$	$x < 1$

113	$\log(10 - x^2) - \log 8 \geq 2 \log \frac{x}{5} - 2 \log \frac{\sqrt{2}}{5}$	$0 < x \leq \sqrt{2}$
114	$\log(x - 1) - 2 \cdot \log(x + 1) - \log 8 \geq -2$	$\frac{3}{2} \leq x \leq 9$
115	$\log_2(x + 1) + \log_2 3 > \log_2(x - 1)$	$x > 1$
116	$\frac{1}{2} \log(x + \sqrt{2}) < \log(2 - x^2) - \frac{1}{2} \log(\sqrt{2} - x)$	$-1 < x < 1$
117	$\log_4(x^2 + 2) - \log_4(x^2 - 1) > \log_4 5 - \log_4(x + 1)$	$x > 1$
118	$\log_3(3x - 1) + \log_3(4 - x) - 1 \leq \log_3(x + 2) + \log_3(2 - x)$	$\frac{1}{3} < x \leq \frac{16}{13}$
119	$\log \sqrt{x - 3} + \log \sqrt{x + 3} > \log 4$	$x > 5$
120	$\log_3 4 + \log_3 2 + 2 \log_3 x > \log_3(x^2 - 3) + \log_3(x^2 + 3)$	$\sqrt{3} < x < 3$
121	$3 \log_2(x + 2) - 3 \log_2(2x - 1) + \log_2 4 - \log_3 9 \geq 0$	$\frac{1}{2} < x \leq 3$
122	$\log(2x + 2) - \log(x - 1) < 1 - [\log(3x - 2) - \log x]$	\emptyset
123	$\frac{1}{2} \ln(x - 1) + \ln \sqrt{3} < \frac{1}{2} [\ln(5x^2 - 20) - \ln(x - 2)]$	$x > 2$
124	$\log_2 x^2 - x < 1$	$-1 < x < 2 \wedge x \neq (0; 1)$
125	$\log(\log(x^2 - 6)) < 0$	$-4 < x \leq -\sqrt{7} \vee \sqrt{7} < x < 4$
126	$\log_{\frac{1}{3}} \log_{\frac{1}{3}}(5x + 9) > 0$	$-\frac{26}{15} < x < -\frac{8}{5}$

127	$\log_2 \log_3 \frac{3x-1}{x} \geq 2$	$-\frac{1}{78} \leq x < 0$
128	$\log_{\frac{1}{3}} \log_2(3x-1) < 0$	$x > 1$
129	$\log_{2x}(x^2+1) \geq 1$	$x > \frac{1}{2}$
130	$\log_x 2 \geq \frac{1}{\sqrt{2}}$	$1 < x \leq 2^{\sqrt{2}}$
131	$\log_x 4 > 1$	$1 < x < 4$
132	$\log_{x+1} 1 < 0$	\emptyset
133	$\log_{x-2} 9 \leq 2$	$2 < x < 3 \vee x \geq 5$
134	$\log_{\frac{1}{x}} -2 > 2$	\emptyset
135	$\log_{3-2x} \frac{1}{3} < -2$	$\frac{3-\sqrt{3}}{2} < x < 1$
136	$\log_x x \geq 0$	$0 < x < 1 \vee x > 1$
137	$\log_x(2x+3) < 2$	$0 < x < 1 \vee x > 3$
138	$2 \log_{3x-1} 4 > 1$	$\frac{2}{3} < x < \frac{17}{3}$
139	$\log_x x-3 \geq 1$	$1 < x \leq \frac{3}{2}$

140	$\log_{x+1} x^2 + x \leq \log_{x+1} x^2 - 3x + 2 $	$0 < x \leq \frac{1}{2}$
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2. risolvere le seguenti disequazioni utilizzando anche una variabile ausiliaria



141	$\log_2^2 x + \log_2 x - 2 > 0$	$0 < x < \frac{1}{4} \vee x > 2$
142	$\log^2 x + 3 \log x + 2 < 0$	$10^{-2} < x < 10^{-1}$
143	$\log_3^2 x - 3 \log_3 x + 2 \leq 0$	$3 \leq x \leq 9$
144	$\log_2^2 x - 4 \log_2 x + 4 > 0$	$x > 0 \wedge x \neq 4$
145	$\log_2^2 x - \log_2 x^3 + 2 \geq 0$	$0 < x \leq 2 \vee x \geq 4$
146	$\log_2^2 x + \log_2 x - 12 \leq 0$	$\frac{1}{16} \leq x \leq 8$
147	$\log_3^2 x + \log_3 x - 12 \leq 0$	$\frac{1}{81} \leq x \leq 27$
148	$\ln^2 x - 3 \ln x - 4 \geq 0$	$0 < x \leq \frac{1}{e} \vee x \geq e^4$
149	$\ln^2 x - 2 \ln x + 1 > 0$	$x > 0 \wedge x \neq e$
150	$2 \log^2 x - 3 \log x + 1 > 0$	$0 < x < \sqrt{10} \vee x > 10$
151	$2 \log^2 x + 9 \log x + 4 < 0$	$10^{-4} < x < 10^{-\frac{1}{2}}$
152	$2 \log^2 x - 5 \log x > 7$	$0 < x < \frac{1}{10} \vee x > 10^{\frac{7}{2}}$

153	$4 \log^2 x + 3 \log x > 1$	$0 < x < 10^{-1} \vee x > 10^{\frac{1}{4}}$
154	$4 \log_2^2 x + 3 \log_2 x < 1$	$\frac{1}{2} < x < \sqrt[4]{2}$
155	$2 \log^2 x + 3 \leq 7 \log x$	$\sqrt{10} \leq x \leq 10^3$
156	$3 \log^2 x + \log x \geq -4$	$x > 0$
157	$4 \log_{\frac{1}{2}}^2 x - 5 \log_{\frac{1}{2}} x + 1 < 0$	$\frac{1}{2} < x < \frac{\sqrt[4]{8}}{2}$
158	$3 \log_2^2 x - 7 \log_2 x + 2 > 0$	$0 < x < \sqrt[3]{2} \vee x > 4$
159	$3 \ln^2 x + 5 \ln x - 2 \geq 0$	$0 < x \leq e^{-2} \vee x \geq \sqrt[3]{e}$
160	$3 \log_2^2 x + 5 \log_2 x < 8$	$2^{-\frac{8}{3}} < x < 2$
161	$\log^2 x - 4 \log x > 0$	$0 < x < 1 \vee x > 10^4$
162	$2 - 4 \log^2 x \geq 0$	$10^{-\frac{\sqrt{2}}{2}} \leq x \leq 10^{\frac{\sqrt{2}}{2}}$
163	$\log_{\frac{4}{3}}^2 2x - 2 \log_{\frac{4}{3}} 2x - 8 < 0$	$\frac{9}{32} < x < \frac{128}{81}$
164	$\log_{\frac{1}{2}}^2(x+1) > 1$	$-1 < x < -\frac{1}{2} \vee x > 1$
165	$-2 \ln^2 x + \ln x + 1 > 0$	$\frac{\sqrt{e}}{e} < x < e$
166	$3(\log x + 1) > 5 \log^2 x$	$10^{\frac{3-\sqrt{69}}{10}} < x < 10^{\frac{3+\sqrt{69}}{10}}$

167	$(2 \log x - 5) \log x < 3 - \log x$	$10^{\frac{2-\sqrt{10}}{2}}; 10^{\frac{2+\sqrt{2}}{2}}$
168	$\log_2^2 x - \log_2 x^3 + 2 \geq 0$	$0 < x \leq 2 \vee x \geq 4$
169	$\log x (\log x + 1) + 5 \log x \geq \log^2 x + 4 \log x - 7$	$x \geq 10^{-\frac{7}{2}}$
170	$\log_3 2x^2 (\log_3 2x^2 - 1) < \log_3 2x^2 + 3$	$-\frac{3\sqrt{6}}{2} < x < -\frac{\sqrt{6}}{6} \vee \frac{\sqrt{6}}{6} < x < \frac{3\sqrt{6}}{2}$
171	$\log_3^2(x-1) - 2\log_3(x-1) \geq 3$	$1 < x \leq \frac{4}{3} \vee x \geq 28$
172	$2\ln^2(x-1) - 5\ln(x-1) + 2 \leq 0$	$\sqrt{e} + 1 \leq x \leq e^2 + 1$
173	$2\log_2^2(2x+1) + \log_2(2x+1) - 1 < 0$	$-\frac{1}{4} < x < \frac{1}{2}(\sqrt{2}-1)$
174	$2\log_{\frac{1}{2}}^2(1-x) - 5\log_{\frac{1}{2}}(1-x) + 3 \geq 0$	$x \leq \frac{1}{2} \vee \frac{1}{4}(4-\sqrt{2}) \leq x < 1$
175	$2\log_3^2(x^2) - 3\log_3(x^2) - 2 \leq 0$	$-3 \leq x \leq -\frac{1}{\sqrt[4]{3}} \vee \frac{1}{\sqrt[4]{3}} \leq x \leq 3$
176	$4\log_{\frac{1}{3}}^2(x^2+1) - 4\log_{\frac{1}{3}}(x^2+1) + 1 > 0$	R
177	$\log_3^2(x+2) - \log_3(x+2) - 2 \leq 0$	$-\frac{5}{3} \leq x \leq 7$
178	$(\log_2 x^2)^2 + 9 \log_2 x + 2 > 0$	$0 < x < \frac{1}{4} \vee x > \frac{\sqrt[4]{8}}{2}$
179	$\log_3^2(4-x) - 2\log_3(4-x) \leq 0$	$-5 \leq x \leq 3$
180	$3\log_{\frac{1}{2}}^2 x - \left(\log_{\frac{1}{2}} x - 1\right)^2 < 3$	$\frac{1}{2} < x < 4$

181	$(\log_2(3x + 4) - 1)^2 > \log_2 2$	$-\frac{4}{3} < x < -1 \vee x > 0$
182	$\log_2 x^3 \left(\log_2 x + \frac{7}{3} \right) - 6 \geq 0$	$0 < x \leq \frac{1}{8} \vee x \geq \sqrt[3]{4}$
183	$5 \ln^3 \sqrt{x} + 6 \ln^2 \sqrt{x} - 9 \ln \sqrt{x} \leq 2$	$0 < x \leq e^{-4} \vee \frac{\sqrt[5]{e^3}}{e} \leq x \leq e^2$
184	$\ln^3 x - 9 \ln x > 0$	$e^{-3} < x < 1 \vee x > e^3$
185	$\log^3 x - \log^2 x < 0$	$0 < x < 10 \wedge x \neq 1$
186	$\log^3 x + 2 \log^2 x - 3 \log x \leq 0$	$0 < x \leq \frac{1}{1000} \vee 1 \leq x \leq 10$
187	$\log_3^3 x - \log_3^2 x - 2 \log_3 x \leq 0$	$0 < x \leq \frac{1}{3} \vee 1 \leq x \leq 9$
188	$3 \log_3^2 \frac{x+1}{x-1} + 7 \log_3 \frac{x-1}{x+1} + 2 < 0$	$\frac{5}{4} < x < \frac{1 + \sqrt[3]{3}}{\sqrt[3]{3} - 1}$
189	$2 \ln^3 x - 4 \ln^2 x + \ln x - 2 < 0$	$0 < x < e^2$
190	$\log_2^4(2x - 3) - 5 \log_2^2(2x - 3) + 4 \leq 0$	$\frac{13}{8} \leq x \leq \frac{7}{4} \vee \frac{5}{2} \leq x \leq \frac{7}{2}$
191	$\log_2 x \leq \sqrt{\log_2 x + 1}$	$\frac{1}{2} \leq x \leq 2^{\frac{1+\sqrt{5}}{2}}$
192	$2 - \log \sqrt{x} \leq \frac{1 - \log \sqrt{x}}{2}$	$x \geq 10^6$
193	$\sqrt{\ln x} \leq 1 - \ln x$	$1 \leq x \leq e^{\frac{3-\sqrt{5}}{2}}$

194	$\log_4^2 x - \log_{ x }4 \leq 0$	$-4 \leq x < -1 \vee 1 < x \leq 4$
195	$\log_{x-1}^2 3 - \log_{x-1} 3 - 2 \geq 0$	$\frac{4}{3} \leq x \leq 1 + \sqrt{3} \wedge x \neq 2$
196	$\log_{2x+1}^2 27 + \log_{2x+1} \frac{1}{27} - 6 \geq 0$	$\frac{\sqrt{3}-9}{18} \leq x \leq 1 \wedge x \neq 0$

3. risolvere le seguenti equazioni con logaritmi di basi diverse



197	$\log_2 x \geq \log_3 9$	$x \geq 4$
198	$\log_3 x \leq \log_4 64$	$0 < x \leq 27$
199	$\log_{\frac{1}{2}} x + 8 \log_{49} 7 > 0$	$0 < x < 16$
200	$2 \log_2 x > \log_{\frac{1}{4}} 3x$	$x > \frac{\sqrt[5]{81}}{3}$
201	$2 \log_2 x < \log_5 25$	$0 < x < 2$
202	$\log_5 x - \log_{25} x < 1$	$0 < x < 25$
203	$3 \log_9 x + \log_3 x < 10$	$0 < x < 81$
204	$\log_2 \frac{x}{2} - \log_4 3x < 1$	$0 < x < 48$
205	$3 \log_9 x - \log_{\frac{1}{3}} x > 2 - 2 \log_3 x$	$x > \sqrt[5]{81}$

206	$\log_2(3 - 2x) - 2 \log_{\frac{1}{2}} x \geq 0$	$x = 1$
207	$\log_2(x - 2) - \log_4(3x - 1) \geq 1$	$x \geq 8 + 2\sqrt{14}$
208	$\log_3^2(3x - 1) - \log_{\frac{1}{3}}(3x - 1) < 0$	$\frac{4}{9} < x < \frac{2}{3}$
209	$\log_{\frac{1}{2}}(x - 1) - \log_2(x + 1) > 3$	$1 < x < \frac{3\sqrt{2}}{4}$
210	$\log_3(2x - 1) + \log_{\frac{1}{3}}(x - 4) > -1$	$x > 4$
211	$(2x - 1) \log_7 2 > 1 + x \log_{\frac{1}{7}} 4$	$x > \frac{\ln 14}{\ln 16}$
212	$\log_2(x - 1) > \log_{\frac{1}{2}}(3 - x) - 1$	$2 - \frac{\sqrt{2}}{2} < x < 2 + \frac{\sqrt{2}}{2}$
213	$2 \log_3(2x + 1) + \log_{\frac{1}{3}} x < 3 - 2 \log_9 x$	$0 < x < \frac{1}{2}(3\sqrt{3} - 1)$
214	$\log_{\frac{1}{9}} x - \log_{\frac{1}{3}} x + \log_4 16 \geq 0$	$x \geq \frac{1}{81}$
215	$\log_4(1 - x^2) - \log_4(5x^2 + 3) < \log_2 x$	$\frac{\sqrt{5}}{5} < x < 1$
216	$\log_2(x - 2) - \log_2(3 - 2x) \geq \log_{\frac{1}{2}} 4x$	\emptyset
217	$\log_2 x - \log_{\frac{1}{2}} x \geq \log_4 9 + \log_2(x + 2)$	$x \geq \frac{1}{2}(3 + \sqrt{33})$

218	$2\log_4^2(x-1) + \log_{\frac{1}{4}}(x-1) > 0$	$1 < x < 2 \vee x > 3$
219	$\frac{1}{2}\log_3 x^2 + 2 \leq -\log_{\frac{1}{3}} 2$	$-\frac{2}{9} \leq x \leq \frac{2}{9} \wedge x \neq 0$
220	$\log_3^2(x-2) + \log_{\frac{1}{3}}(x-2) \leq 6$	$\frac{19}{9} \leq x \leq 29$
221	$\log_2^2 x + 5\log_{\frac{1}{2}} x + 6 \geq 0$	$0 < x \leq 4 \vee x \geq 8$
222	$\log_3^2(2x-1) + 2\log_{\frac{1}{3}}(2x-1) - 3 < 0$	$\frac{2}{3} < x < 14$
223	$2\log_4^2 3x + \log_{\frac{1}{4}} 3x - \log_3 3 > 0$	$0 < x < \frac{1}{6} \vee x > \frac{4}{3}$
224	$\log_3^2(x-1) + \log_{\frac{1}{3}}(x^2 - 2x + 1) - 8 > 0$	$1 < x < \frac{10}{9} \vee x > 82$
225	$\log_{\frac{1}{3}}^2 x - \log_3 \frac{1}{x} - 6 \leq 0$	$\frac{1}{27} \leq x \leq 9$
226	$\log_2^2(x-1) + \log_{\sqrt{2}}(x-1) - 8 > 0$	$1 < x < \frac{17}{16} \vee x > 5$
227	$\log_2(x^2 - 1) \geq -\log_{\frac{1}{2}} 4 + 2\log_4 x$	$x \geq 2 + \sqrt{5}$
228	$\log_{\frac{1}{3}}^2(3x+1) + \log_3(3x+1)^6 \geq -9$	$x > -\frac{1}{3}$
229	$2\log_{\frac{1}{3}}\left(\frac{1}{3}x - 1\right) > 2 - \log_9 x^4$	$x > 3$

230	$\log_2^4(3x + 1) + 5\log_{\frac{1}{2}}^2(3x + 1) - 36 < 0$	$-\frac{1}{4} < x < 1$
231	$\log_2 \sqrt{x - 2} - \frac{1}{2} \log_{\frac{1}{2}}(2 + x) \leq \log_4 x$	$2 < x \leq \frac{1 + \sqrt{17}}{2}$
232	$\log_4^2 x + \log_2 x - 3 \leq 0$	$-4 \leq x \leq -\frac{1}{64} \vee \frac{1}{64} \leq x \leq 4$
233	$\log_2 \sqrt{x - 2} + \frac{1}{2} \log_{\frac{1}{2}}(2 + x) \leq \log_4 x$	$x > 2$
234	$\log_2^2 x - \log_{\frac{1}{2}} x ^3 - 4 < 0$	$-2 < x < -\frac{1}{16} \vee \frac{1}{16} < x < 2$
235	$\log_2 \frac{\sqrt{x^2 - 1}}{x + 4} \geq \log_4 \frac{(x + 4)^2}{(x^2 - 1)}$	$-4 < x \leq -\frac{17}{8}$
236	$\log_2 \sqrt[3]{x} - \log_4 x + \log_2 x^2 < 2$	$0 < x < 2^{11}\sqrt{2}$
237	$\log_5 \sqrt[16]{5} + 2\log_{25} x - 3\log_5 x \geq 0$	$0 < x \leq \sqrt[32]{5}$
238	$\log_2 x\sqrt{x} + 4\log_4 \sqrt{x} - \log_{16} x^{12} - 1 < 0$	$x > \frac{1}{4}$
239	$\log_2 \ln(x + 1) > 1 - \log_4 3$	$x > e^{\frac{2}{\sqrt{3}}} - 1$
240	$-\log_{\frac{1}{3}}(2x + 5) (\log_3(2x + 5) - 1) \geq 2$	$-\frac{5}{2} < x \leq -\frac{7}{3} \vee x \geq 2$
241	$\log_2(1 + \sqrt{x + 1}) + \log_2(1 - \sqrt{x + 1}) \geq \log_4(2 - x)$	\emptyset

242	$\frac{1}{5} \log_3(x+1) - \log_{x+1} 3 > \frac{4}{5}$	$-\frac{2}{3} < x < 0 \vee x > 242$
243	$\log_3 x - 2 \log_x 9 \geq 3$	$\frac{1}{3} \leq x < 1 \vee x \geq 81$
244	$\log_x 3 \leq 2 \log_{\frac{1}{x}+1} \sqrt{3}$	$0 < x < 1 \vee x \geq \frac{1+\sqrt{5}}{2}$
245	$\log_{x+2} 4 + \log_4(x+2) \geq 2$	$x > -1$
246	$\log_3(3x-1) + \log_{3x-1} 9 < 3$	$\frac{1}{3} < x < \frac{2}{3} \vee \frac{4}{3} < x < \frac{10}{3}$

4. risolvere le seguenti equazioni logaritmiche/esponenziali



247	$\ln 3^x < 0$	$x < 0$
248	$\ln 2^x > 0$	$x > 0$
249	$\log_5 7^x < 1$	$x < \log_7 5$
250	$\log_2 3^x - 2 \leq 0$	$x \leq \frac{\ln 4}{\ln 3}$
251	$\log_5 2^{x-1} > \frac{1}{4}$	$x > 1 + \frac{1}{4 \log_5 2}$
252	$\ln(1 - e^x) \leq 0$	$x < 0$
253	$\ln 4^{x^2-6} - \ln 64 \leq 0$	$-3 \leq x \leq 3$

254	$\ln 5^x + \ln 5^{-2x} < 0$	$x > 0$
255	$\log_2(3^x - 1) \leq 1$	$0 < x \leq 1$
256	$\ln(e^x + 1) > 0$	R
257	$\log(25^x + 5) < \log 6$	$x < 0$
258	$\log_3(5^{x^2-4x}) \geq 0$	$x \leq 0 \vee x \geq 4$
259	$\log_2 3^x < \log_2 1$	$x < 0$
260	$\log_2 3^{x+1} - \log_2 3^{2x} \geq 0$	$x \leq 1$
261	$\ln 2^{3x-1} + \ln 4^x \leq 0$	$x \leq \frac{1}{5}$
262	$2 \log_4 3^x > -\log_2 9$	$x > -2$
263	$\log 5^{x+1} - \log 3^{2x} \leq 0$	$x \geq \frac{\log 5}{\log 9 - \log 5}$
264	$\log(e^x + 1) > \log(e^{2x} - 1)$	$0 < x < \ln 2$
265	$\ln(e^{2x} - 1) < \ln(1 - e^x)$	\emptyset
266	$\log(5^{1+\sqrt{x}} + 5^{1-\sqrt{x}}) \leq 1$	$x = 0$

267	$\log_2(4^x + 2^x) - \log_2 2 < 0$	$x < 0$
268	$\log(2^{x+1} + 3) > \log 4^x$	$x < \log_2 3$
269	$\log_{\frac{1}{6}}\left(2\left(\frac{1}{2}\right)^x - 2^x\right) \leq 0$	$x \leq 0$
270	$\log_4 7^{-x} > \log_4 7 + \log_4 1$	$x < -1$
271	$\log 5^{1-x} - \log 4 > 1$	$x < -\log_5 8$
272	$\log(e^x + e) \geq 2$	$x \geq \ln(100 - e)$
273	$\ln 2^{\frac{x-1}{2}} - 1 \geq 0$	$x \geq 1 + \frac{2}{\ln 2}$
274	$2 \ln \frac{x-1}{3^{3x+1}} > \ln 9$	$-1 < x < -\frac{1}{3}$
275	$\ln(2^{2x} - 9 \cdot 2^x + 21) \leq 0$	$2 \leq x \leq \frac{\ln 5}{\ln 2}$
276	$\log_2(2^x + 1) + \log_2^2(2^x + 1) - 2 \geq 0$	$x \geq 0$
277	$\log 5 + (x - 2) \log 4 < \log(4^x - 11)$	$x > 2$
278	$\ln(9^x - 3^x) \geq 0$	$x \geq \frac{\ln(\sqrt{5} + 1) - \ln 2}{\ln 3}$
279	$\ln\left(2^{\frac{x^2-x}{x+1}}\right) \leq 0$	$x < -1 \vee 0 \leq x \leq 1$
280	$\log 2^{3x^2-2x} > \frac{1}{3} \log 2$	$x < \frac{1}{3}(1 - \sqrt{2}) \vee x > \frac{1}{3}(1 + \sqrt{2})$

281	$\log_3 2^{x-2} + \log_3 4 > 3$	$x > \frac{3 \ln 3}{\ln 2}$
282	$\ln 3^{\frac{x-2}{x+1}} - \ln 9 \leq 0$	$x \leq -4 \vee x > -1$
283	$\log_3 \left(9^{x+\frac{3}{2}} - 2 \right) \geq x + 1$	$x \geq -1$
284	$1 - \log 3^x \leq \log 2^x$	$x \geq \frac{\ln 10}{\ln 6}$
285	$\frac{3}{2} \ln 2^{x+1} - 2 \ln \frac{1}{2} \geq 1$	$x \geq \frac{1}{3} \left(\frac{2}{\ln 2} - 7 \right)$
286	$-2 \log 4^{2-x} + 5 \log 2^{x+1} \geq 1$	$x \geq \log_{512} 80$
287	$-\ln 2^x + 2 \ln 3 < 1 - \ln 4^{-x}$	$x > \frac{\ln 9 - 1}{\ln 8}$
288	$(x + 1) \ln 3 - \ln \frac{1}{9} > 2 \ln \left(\frac{1}{3} \right)^x$	$x > -1$
289	$\ln(e^x - 1) + \ln(2e^{2x} - 5e^x + 3) \leq \ln 1$	$\ln \frac{3}{2} < x \leq \ln 2$
290	$\log_8 \left(4^{\frac{1}{x}} + 3 \cdot 2^{\frac{1}{x}} \right) \leq 0$	$\frac{\ln 2}{\ln(\sqrt{13} - 3) - \ln 2} \leq x < 0$
291	$3 - x + \log_2 3^{2x+1} < 0$	$x < -\frac{\ln 24}{\ln 9 - \ln 2}$
292	$2 - 3x \log_4 3^x + 2(\log_4 9 - \log_4 4) \geq 0$	$-\frac{2\sqrt{3}}{3} \leq x \leq \frac{2\sqrt{3}}{3}$
293	$2 \log \sqrt[4]{2^x} < 3x \log 2 - \log 2 - \log 2^{1-x} + \log(4 \cdot 2^x)$	$x > 0$
294	$x \log_2 3 + \log_2 5^x < (2x - 1) \log_2 5 - x \log_2 5$	$x < -\frac{\ln 5}{\ln 3}$

295	$\log(2^{4x} - 1) + 2 \log 3 \geq (1 - 2x) \log 4$	$x \geq \log_{16} \left(\frac{4}{3}\right)$
296	$\log(4^x - 1) + \log 2 \geq \log(2^{2x} + 3 \cdot 2^{x+1} - 10)$	$\log_2(-3 + \sqrt{19}) < x \leq 1 \vee x \geq 2$
297	$\ln 3^x - 1 > x \ln 9$	$x < \log_3 \left(\frac{\sqrt{5} - 1}{2}\right)$
298	$2 \log_3 4^x < \log_{\frac{1}{3}} 2^{-x}$	$x < 0$
299	$x^2 \log_3 2^{\frac{1}{x}} - 3 \log_{\frac{1}{3}} 2 \geq 0$	$-3 \leq x < 0 \vee x > 0$
300	$\frac{2 \log_3 e^{2x}}{5} - 1 > \log_9 4$	$x > \frac{5}{4} \ln 6$
301	$\frac{2}{3} x \log_3 2^x + \frac{3}{2} \log_9 3^x < 0$	$-\frac{9 \ln 3}{8 \ln 2} < x < 0$
302	$\log(3^{2x} + 2) + \log_{\frac{1}{10}}(3^x - 2) < 1$	$\log_3 5 - \sqrt{3} < x < \log_3 5 + \sqrt{3}$
303	$\ln 3^x + 2 \log_{3^x} e - 3 \leq 0$	$x < 0 \vee \frac{1}{\ln 3} \leq x \leq \frac{2}{\ln 3}$
304	$x \log 2 - 3 \log_{2^x} 10 - 2 < 0$	$x < -\frac{\ln 10}{\ln 2} \vee 0 < x < 3 \frac{\ln 10}{\ln 2}$
305	$3 \log_2 2^x + 4 \log_4 \sqrt{2^x} < 1 + \frac{1}{2} \log_2 2^{6x}$	$x > 1$

5. risolvere le seguenti disequazioni di riepilogo



306	$\log_{\frac{1}{4}}(x + 1) > \log_{\frac{1}{4}}(2 - x)$	$-1 < x < \frac{1}{2}$
307	$2 \log_2 x - 3 < 0$	$0 < x < 2^{\frac{3}{2}}$
308	$\ln 5 - \ln(x - 1) > 2 \ln 4$	$1 < x < \frac{21}{16}$

309	$4 \log^2 x \geq 1$	$0 < x < 10^{-\frac{1}{2}} \vee x \geq 10^{\frac{1}{2}}$
310	$\log_2^2 x - 4 \log_2 x + 3 < 0$	$2 < x < 8$
311	$\log \frac{4-x}{x+8} > 0$	$-8 < x < -2$
312	$2 \log_2(x+2) + \log_{\frac{1}{2}} x + 1 \geq 0$	$x > 0$
313	$2x \log 5 - \log 5 > 1 + x \log 25$	\emptyset
314	$x \ln 3 < \ln 1 - x \ln 9$	$x < 0$
315	$\ln(x^2 - x) < \ln 6$	$-2 < x < 0 \vee 1 < x < 3$
316	$\log \frac{6x-4}{5x+8} > 1$	$-\frac{21}{11} < x < -\frac{8}{5}$
317	$\log_2^2 x - 6 \log_2 x + 8 > 0$	$0 < x < 4 \vee x > 16$
318	$3 \log^2 x + 5 \log x < 0$	$10^{-\frac{5}{3}} < x < 1$
319	$\log_{\frac{1}{2}} x + \log_2 3 - \log_2 x \geq 0$	$0 < x \leq \sqrt{3}$
320	$\ln(3 \cdot 2^x) > 0$	$x > \log_2 \frac{1}{3}$

321	$\ln(7 - 2^x) > \ln(4^x + 5) - \ln 7$	$x < 2$
322	$\log_2^2(2x + 1) - \log_{\frac{1}{2}}(2x + 1) \geq 0$	$-\frac{1}{4} < x \leq -\frac{1}{4} \vee x \geq 0$
323	$3\log_{\frac{1}{2}}^2 x - 11\log_{\frac{1}{2}} x - 4 < 0$	$\frac{1}{16} < x < \sqrt[3]{2}$
324	$\log_2 \frac{5x + 4}{2 - x} > 1$	$0 < x < 2$
325	$7 \ln \sqrt[3]{x} + \ln x^2 \leq 5$	$0 < x \leq e^{\frac{15}{13}}$
326	$\log_3 \sqrt{x} \geq \frac{1}{2} \log_3 x$	$x > 0$
327	$x \ln 4 + \ln 3 < 2x \ln 3$	$x > \frac{\ln 3}{2(\ln 3 - \ln 2)}$
328	$\log_{\frac{1}{2}} 3^{2x-1} > \log_2 1 - \log_2 3$	$x < 1$
329	$\log_{\frac{1}{4}}(x + 1) + \log_{\sqrt{2}} x - \log_2 4x^2 \leq 0$	$x > 0$
330	$\ln^2 x^2 - \ln x^2 + 3 < 0$	\emptyset
331	$\log_{\frac{2}{3}}^2(x - 2) - 2\log_{\frac{3}{4}}(x - 2) - 3 \geq 0$	$2 < x \leq \frac{155}{64} \vee x \geq \frac{10}{3}$
332	$\log_x \frac{x + 3}{x - 1} > 1$	$1 < x < 3$

333	$(x - 2) \ln 4 - \ln 8 > \ln 2 - \ln 7$	$x > \frac{\ln 256 - \ln 7}{\ln 4}$
334	$\log(\log(x^2 + 2)) \geq 0$	$x \leq -2\sqrt{2} \vee x \geq 2\sqrt{2}$
335	$\log(x + 5) > \log(2 - x^2) - \log(5 - x)$	$-\sqrt{2} < x < \sqrt{2}$
336	$2 \log^2 x + 5 \log x - 3 \leq 0$	$10^{-3} \leq x \leq \sqrt{10}$
337	$\log^3 x - \log x > 0$	$\frac{1}{10} < x < 1 \vee x > 10$
338	$\log_2(2^x - 1) \log_2(2^{x+1} - 2) < 0$	$\log_2 \frac{3}{2} < x < 1$
339	$\log_{\frac{1}{2}} x > \log_2(x - 1)$	$1 < x < \frac{1 + \sqrt{5}}{2}$
340	$\log(3^x + 1) + \log(3^x - 1) \leq 2$	$0 < x \leq \frac{1}{2} \log_3 101$
341	$\log_2(x - 3)^2 (\log_2(x - 3) - 2) - \log_{\frac{1}{2}}(x - 3) < 2$	$\frac{\sqrt{2}}{2} + 3 < x < 7$
342	$3 \log_3^2 x - \log_3 x^2 - \log_3 3 \geq 0$	$0 < x < \frac{\sqrt[3]{9}}{3} \vee x > 3$
343	$\log_{\frac{1}{3}}(2x^2 + 6) > \log_{\frac{1}{3}}(x^2 + 5x)$	$2 < x < 3$
344	$\log x + \log\left(\frac{1}{x} + x\right) \geq 0$	$x > 0$
345	$\log \frac{x}{x+2} + \log(x+2) > 2$	$x > 100$

346	$\log_x \frac{4x+5}{6-5x} < -1$	$\frac{1}{2} < x < 1$
347	$\log \frac{x^2+5x+4}{x^2+5x+6} < 0$	$x < -4 \vee x > -1$
348	$\log \frac{x^2+14x+16}{x-1} > 1$	$x > 1$
349	$\ln(x+1) \geq 1 + 2 \ln x$	$0 < x \leq \frac{1+\sqrt{1+4e}}{2e}$
350	$\log_{\frac{1}{2}} \sqrt{4x-4} > \log_{\frac{1}{2}} 4 - \log_{\frac{1}{2}} \sqrt{5x+4}$	$x \leq -\frac{4}{5} \vee 1 \leq x < \frac{1+\sqrt{161}}{10}$
351	$\frac{1}{2} \log 4 - \log 3 + \log(x-1) \leq 2 + \log 3x$	$x > 1$
352	$\ln 2x + 2 \ln x \geq 6 - \ln x$	$x \geq \frac{e^4 \sqrt[4]{8e^2}}{2}$
353	$\frac{\frac{1}{3} + 2 \log_{\frac{1}{8}} x}{3} - \frac{3 \left(\frac{1}{3} + \log_{\frac{1}{8}} x \right)}{2} \geq -\frac{2}{3}$	$x \geq \frac{1}{2}$
354	$\log_2^2 x + 95 \geq 8\sqrt{6} \log_2 x$	$0 < x \leq 2^{4\sqrt{6}-1} \vee x \geq 2^{4\sqrt{6}+1}$
355	$\log_2 \frac{x+1}{x-1} < \log_{\frac{1}{2}} \frac{x^2-3x+2}{x^2+1}$	$-3 < x < -1 \vee x > 2$
356	$\log_{\frac{1}{4}}(e^{2x} + 1) > \log_{\frac{1}{4}} e^x$	\emptyset
357	$\log_2 e^{3x-1} > \log_{\frac{1}{2}} 3$	$x > \frac{1}{3}(1 - \ln 3)$

358	$((x + 1) \log 3 - 1)(1 + \log 3^{x+1}) < 0$	$-1 - \frac{1}{\log 3} < x < -1 + \frac{1}{\log 3}$
359	$\ln^2 x + 2 \ln x > 15$	$0 < x < e^{-3} \vee x > e^3$
360	$\log_3 x \geq -1$	$x \leq -\frac{1}{3} \vee x \geq \frac{1}{3}$
361	$\log_5 \frac{1 + x }{1 - x } > \log_5 2$	$-1 < x < -\frac{1}{3} \vee \frac{1}{3} < x < 1$
362	$\log_2 x^2 + 2 \geq 2 - \sqrt{2}$	$x \leq -\sqrt{2} \vee x \geq \sqrt{2}$
363	$\sqrt{1 - x^2} - \log_3 x > 0$	$-1 < x < 1 \wedge x \neq 0$
364	$\log(x^2 + 4 x) - 2\log(x + 1) \geq 0$	$-1 < x \leq -\frac{1}{6} \vee x \geq \frac{1}{2}$
365	$\log \frac{(x - 1)}{x} < 0$	$-1 < x < -\frac{1}{2} \vee x > 1$
366	$\log_{\frac{1}{2}} x + 2 < 3$	$x < -\frac{17}{8} \vee x > -\frac{15}{8}$
367	$\log_x \frac{x}{x - 2} < 2$	$x > 1 + \sqrt{2}$
368	$\ln^2(x^2 - 1) + 3\ln(x^2 - 1) < 0$	$-\sqrt{2} < x < -\sqrt{1 + \frac{1}{e^3}} \vee \sqrt{1 + \frac{1}{e^3}} < x < \sqrt{2}$

369	$\log_3^2(2x^2 - x) < 1$	$-1 < x < \frac{3 - \sqrt{33}}{12} \vee$ $\frac{3 + \sqrt{33}}{12} < x < \frac{3}{2}$
370	$\log_{\frac{1}{3}}^2(x^2 - 1) + \log_3(x^2 - 1) - \log_3 9 \geq 0$	$x \leq -2 \vee -\frac{\sqrt{10}}{3} \leq x < -1 \vee$ $1 < x \leq \frac{\sqrt{10}}{3} \vee x \geq 2$
371	$3\log_8^2[x(x - 2)] < 1 - 2\log_{\frac{1}{16}}[x(x - 2)]$	$1 - \sqrt{1 + 2\frac{3 + \sqrt{57}}{4}} < x < 1 - \sqrt{1 + 2\frac{3 - \sqrt{57}}{4}}$ \vee $1 + \sqrt{1 + 2\frac{3 - \sqrt{57}}{4}} < x < 1 + \sqrt{1 + 2\frac{3 + \sqrt{57}}{4}}$
372	$\log_2(x + 2x^2) - \log_3 9 < 1$	$\frac{-1 - \sqrt{65}}{4} < x < -\frac{1}{2} \vee$ $0 < x < \frac{-1 + \sqrt{65}}{4}$
373	$\log_3 2x^2 - \log_3 9 > 1 - 2\log_{2x^2} 3$	$x < -\frac{3}{\sqrt{2}} \vee -\sqrt{\frac{3}{2}} < x < -\frac{1}{\sqrt{2}} \vee$ $\frac{1}{\sqrt{2}} < x < \sqrt{\frac{3}{2}} \vee x > \frac{3}{\sqrt{2}}$
374	$\log_{\frac{1}{2}}^2[x(x + 4)] \leq \log_{\frac{1}{2}}[x(x + 4)]$	$-2 - \sqrt{5} \leq x \leq \frac{-4 - 3\sqrt{2}}{2} \vee$ $\frac{-4 + 3\sqrt{2}}{2} \leq x \leq -2 + \sqrt{5}$

