

Disequazioni logaritmiche frazionarie / prodotto

indice

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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 frazionarie utilizzando la definizione ed i teoremi sui logaritmi 

1	$\frac{\log x}{x} > 0$	$x > 1$
2	$\frac{x-2}{\log x - 2} < 0$	$2 < x < 100$
3	$\frac{\log(x+1)}{x+1} \geq 0$	$x \geq 0$
4	$\frac{2x-5}{\log x - 5} > 0$	$0 < x < \frac{5}{2} \vee x > 10^5$
5	$\frac{x^2-1}{\log(2x+1)} < 0$	$0 < x < 1$
6	$\frac{(x-2)(x+3)}{(x+1)\log(x+4)} \leq 0$	$-1 < x \leq 2$
7	$\frac{\ln x - 2}{\ln(x-2)} > 0$	$2 < x < 3 \vee x > e^2$
8	$\frac{\log_2(2x+1)}{\log_3 3x-1} \leq 0$	$0 < x < 1$
9	$\frac{4 + \log_{\frac{1}{2}} x}{3 - \log_{\frac{1}{3}} x} > 0$	$\frac{1}{27} < x < 16$
10	$\frac{2x \cdot \log_{\frac{1}{4}} x}{\log_{\frac{1}{2}}(5x+2)} < 0$	$0 < x < 1$

11	$\frac{\log(x+2) - 2}{\log_2(x+2) + 2} \geq 0$	$-2 < x < -\frac{7}{4} \vee x > 98$
12	$\frac{6 - \log x}{6 - \log x} > 0$	$x > 0 \wedge x \neq 10^6$
13	$\frac{\log_9 x^2 + 1}{x^2} > 0$	$x < -\frac{1}{3} \vee x > \frac{1}{3}$
14	$\frac{\log_2 x - 3}{\log_3 x - 2} > 0$	$0 < x < 8 \vee x > 9$
15	$\frac{\log_{0,5} x - 1}{2 \log_5 x - 3} > 0$	$0,5 < x < 5\sqrt{5}$
16	$\frac{\log_{\frac{1}{3}} x + 3}{\log_{25} x - \frac{1}{2}} < 0$	$0 < x < 5 \vee x > 27$
17	$(\log x - 3)(\log x + 3) \geq 0$	$x \leq 10^{-3} \vee x \geq 10^3$
18	$\log_2(x-1)(3 \ln x - 2) > 0$	$1 < x < \sqrt[3]{e^2} \vee x > 2$
19	$\frac{2 - \log_{\frac{2}{3}} x}{\log_{\frac{2}{3}} x - 1} > 0$	$\frac{4}{9} < x < \frac{2}{3}$
20	$\frac{\log_{\frac{1}{3}} x - 3}{\log_9 x + \frac{1}{2}} \geq 0$	$\frac{1}{27} \leq x < \frac{1}{3}$

21	$\frac{\log_{\sqrt{2}} x - 4}{\log(6x - 8 - x^2)} > 0$	$2 < x < 4 \wedge x \neq 3$
22	$\left(\frac{1}{2} \ln 2x - \ln 3\right) \left(\frac{1}{\ln x} - 4\right) \leq 0$	$1 < x \leq \sqrt[4]{e} \vee x \geq \frac{9}{2}$
23	$\frac{\log(x + \sqrt{3}) + \log(x - \sqrt{3})}{\log(2x - 3) + \log(x - 1)} > 0$	$\sqrt{3} < x < 2 \vee x > 2$
24	$\frac{\ln 3x + \ln \frac{x}{3} - \ln 4}{\log_{\sqrt{2}} x + 2} > 0$	$0 < x < \frac{1}{2} \vee x > 2$
25	$\frac{\ln x - 2 \ln(15 - 4x) + \ln 2}{\ln(15 - 4x)} \leq 0$	$0 < x \leq \frac{25}{8} \vee \frac{7}{2} < x < \frac{15}{4}$
26	$\frac{\log_2(10 - x) - 2 \log_2(4 - x)}{\log_2(4 - x)} > 0$	$1 < x < 3$
27	$\frac{\ln(x - 1) + \ln(x^2 - 4) - \ln(x^3 + 7)}{\log(x - 3) - 1} < 0$	$x > 13$
28	$\frac{\log_2 x + \log_{\frac{1}{2}} \sqrt{x}}{\log(\log x)} > 0$	$x > 10$
29	$\frac{\log x + \log 2}{\log(15 - 4x)} \leq 2$	$0 < x \leq \frac{25}{8} \vee \frac{7}{2} < x < \frac{15}{4}$
30	$\frac{\log_2 x}{\log_2(x - 1)} < 2$	$1 < x < 2 \vee x > \frac{3 + \sqrt{5}}{2}$
31	$\frac{\log(10 - x)}{\log(4 - x)} \geq 2$	$1 \leq x < 3$

32	$\frac{\log(x^3 + 19)}{\log(1 + x)} \leq 3$	$-1 < x < 0 \vee x \geq 2$
33	$\frac{\log_5(2x^2 - x)}{\log_5(x^2 + 4x)} > 1$	$x < -2 - \sqrt{5} \vee x > 5$
34	$\frac{5}{\ln x + 4} - \frac{3}{\ln x - 2} < 4$	$0 < x < e^{-4} \vee e^{-\frac{5}{2}} < x < e \vee x > e^2$
35	$\frac{3}{\log_2 x - 1} + \frac{2}{\log_2 x + 1} \geq 2$	$\frac{1}{2} < x \leq \frac{\sqrt{2}}{2} \vee 2 < x \leq 8$
36	$\frac{1}{\log_{\frac{1}{8}} x} + \frac{1}{2 + \log_{\frac{1}{8}} x} > \frac{3}{4}$	$\frac{1}{64} < x < 1 \vee 16 < x < 64$
37	$\frac{\log_2 x}{\log_2 x - 1} - 1 \leq \frac{2}{1 + \log_2 x}$	$\frac{1}{2} < x < 2 \vee x \geq 8$
38	$\log_2 \frac{x+1}{x-1} - \log_{\frac{1}{2}} \frac{x^2 - 3x + 2}{x^2 + 1} < 0$	$-3 < x < -1; x > 2$
39	$\frac{\log_2(x+1)}{\log_2 x} - \frac{1}{\log_2 x} < -1$	$\emptyset$
40	$\frac{4 - 2 \log_4 x}{\log_4 x} \geq \frac{5 + 3 \log_4 x}{3 \log_4 x + 5}$	$1 < x < 4^{\frac{4}{3}}$
41	$\frac{3 \log_2 x - 1}{2 \log_2 x + 8} - \frac{2 \log_2 x - 3}{\log_2 x^4 + 4} < \frac{13}{40}$	$\frac{1}{16} < x < \frac{1}{2} \vee 2 < x < 2^{\sqrt[9]{128}}$
42	$\frac{\log_2 \log_3(x+4)}{\sqrt{4 - \log_2 x} - 3} > 0$	$0 < x < \frac{1}{32}$

43	$\log \frac{\sqrt{x+4}}{\sqrt{x-1}} + \log 2 \leq \log(3\sqrt{x-2}) - \log(\sqrt{x-2})$	$x > 5$
44	$\log \frac{\sqrt{x+4}}{\sqrt{x-1}} + \log 2 \leq \log(3\sqrt{x} - 2) - \log(\sqrt{x} - 2)$	$4 < x \leq 9 \vee x \geq 36$
45	$\frac{\log_3 x + 1}{\ln(2-x)} \leq 0$	$-\frac{1}{3} \leq x < 0 \vee 0 < x \leq \frac{1}{3} \vee 1 < x < 2$
46	$\frac{2 \log(x-2)}{\ln x - 4} \leq 0$	$3 \leq x < e^4$
47	$\frac{(\log_2 x + 3)(\log_2 x - 2)}{ \log_2 x - 1 } < 0$	$\frac{1}{8} < x < 4 \wedge x \neq 2$
48	$\frac{\log_2(1- x) - 3}{\log_2(\sqrt{1-x} - 2)} > 0$	$\emptyset$
49	$\frac{\log(x+5) - \log(x+1) - \log(3x+3) + \log 2}{2 \log(x+4) - \log(6-x) - \log(2x+5) + \log 2} \geq 0$	$-\frac{1}{4} < x \leq 1$
50	$\frac{x - x^2 - x }{\log\left(x^2 - \frac{8}{3}x\right)} \geq 0$	$-\frac{1}{3} < x < 0 \vee \frac{8}{3} < x < 3$
51	$\left \frac{\ln 2x - \ln 3}{3 - 2 \log_3 x} \right > 0$	$x > 0 \wedge x \neq \left(\frac{3}{2}; 3\sqrt{3}\right)$
52	$\frac{ \ln x }{ \ln x - 1 ^2} \leq \frac{1}{2}$	$0 < x \leq e^{2-\sqrt{3}} \vee x \geq e^{2+\sqrt{3}}$

2. risolvere le seguenti disequazioni frazionarie utilizzando anche una variabile ausiliaria 

53	$\frac{\log_2^2 x - 6 \log_2 x + 5}{1 - \log_2^2 x} \geq 0$	$\frac{1}{2} < x < 2 \vee 2 < x \leq 32$
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54	$\frac{\log_{\frac{1}{2}}^2 x - \log_{\frac{1}{2}} x}{\log_{\frac{1}{2}} x - 4} < 0$	$\frac{1}{16} < x < \frac{1}{2} \vee x > 1$
55	$\frac{1 + \log_3^2 x}{\log_3 x + 1} > 1$	$\frac{1}{3} < x < 1 \vee x > 3$
56	$\frac{\ln x - \frac{1}{2}}{\ln^2 x - \ln x - 2} < 0$	$0 < x < \frac{1}{e} \vee \sqrt{e} < x < e^2$
57	$\frac{\left(\log_{\frac{1}{2}} x\right)^2 - \log_{\frac{1}{2}} x - 2}{\left(\log_{\frac{1}{2}} x\right)^2 + \log_{\frac{1}{2}} x - 2} < 0$	$\frac{1}{4} < x < \frac{1}{2} \vee 2 < x < 4$
58	$\frac{(\log_3 x)^2 + \log_3 x - 12}{1 - \log_3^2 x} \leq 0$	$0 < x \leq \frac{1}{81} \vee \frac{1}{3} < x < 3 \vee x \geq 27$
59	$\frac{\log_2^2 x - 5 \log_2 x + 6}{1 - \log_2^2 x} \geq 0$	$\frac{1}{2} < x < 2 \vee 4 \leq x \leq 8$
60	$\frac{\log_3 x (\log_3 x - 4)}{\log_2 x (3 - \log_2 x)} > 0$	$8 < x < 81$
61	$\frac{\log^2 \sqrt{x} - 3 \log \sqrt{x}}{\log \sqrt{x} + 1} > 0$	$\frac{1}{100} < x < 1 \vee x > 10^6$
62	$\frac{\log_4^3 x - \log_4^2 x}{\log_4 x - 2} > 0$	$0 < x < 1 \vee 1 < x < 4 \vee x > 16$
63	$\frac{1}{\log_{\frac{1}{2}} x} + \log_{\frac{1}{2}} x > 1$	$0 < x < 1$
64	$\frac{\log_5^2 x - \log_5 x}{1 + \log_5 x} > 1$	$\frac{1}{5} < x < 5^{1-\sqrt{2}} \vee x > 5^{1+\sqrt{2}}$

65	$\frac{\ln x}{\ln x + 1} + \frac{2}{\ln x} > 2$	$e^{-\sqrt{2}} < x < e^{-1} \vee 1 < x < e^{\sqrt{2}}$
66	$\frac{\log x - 1}{\log^2 x} - \frac{3}{\log x} > 1$	$\emptyset$
67	$\frac{8}{\log_3 x} - 2 \log_3 x \geq 6$	$0 < x \leq 3^{-4} \vee 1 < x \leq 3$
68	$\frac{1}{\log x} + \frac{2}{\log x + 1} > 2$	$\frac{1}{10} < x < \frac{\sqrt{10}}{10} \vee 1 < x < 10$
69	$2 \log_2(x + 3) + \frac{2}{\log_2(x + 3)} \geq 5$	$-2 < x \leq \sqrt{2} - 3 \vee x \geq 1$
70	$\frac{1}{\ln x - 2} - \frac{1}{2 + \ln x} \geq 1$	$e^{-2\sqrt{2}} \leq x < e^{-2} \vee$ $e^2 < x < e^{2\sqrt{2}}$
71	$\frac{1}{\ln^2 x - 1} - \frac{1}{\ln x - 1} - \frac{1}{\ln x + 1} \leq 0$	$\frac{1}{e} < x < \sqrt{e} \vee x > e$
72	$\frac{3}{\log_2 x - 1} + \frac{2}{\log_2 x + 1} < 2$	$0 < x < \frac{1}{2} \vee \frac{\sqrt{2}}{2} < x < 2 \vee x > 8$
73	$\log_3 x + 4 < -\frac{2}{\log_3 x + 1}$	$0 < x < \frac{1}{27} \vee \frac{1}{9} < x < \frac{1}{3}$
74	$\frac{\ln x - 1}{\ln x + 1} - \frac{1}{\ln x - 1} < \frac{4}{1 - \ln^2 x}$	$\frac{1}{e} < x < e$
75	$\frac{1 + \log x}{\log x - 1} - \frac{\log x + 3}{2 - 2 \log x} \geq \frac{11}{2}$	$10 < x \leq 10^2$
76	$\frac{1 + \log x}{\log x - 1} + \frac{\log x + 3}{2 - 2 \log x} \leq \frac{11}{2}$	$0 < x < 10 \vee x > 10$

77	$\frac{1}{2 \log_2 x - 2} + \frac{3}{\log_2^2 x - 1} > \frac{1}{4}$	$\frac{1}{8} < x < \frac{1}{2} \vee 2 < x < 32$
78	$\frac{1 + \ln x + \ln^2 x}{\sqrt{3 - \ln^2 x}} > 0$	$e^{-\sqrt{3}} < x < e^{\sqrt{3}}$
79	$\frac{\ln^2 x - 2 \ln x + 3}{\ln^2 x - 4 \ln x + 3} > -3$	$0 < x < e \vee e\sqrt{e} < x < e^2 \vee x > e^3$
80	$\frac{2}{\ln x - 1} - \frac{1}{\ln x} \leq \frac{1}{\ln^2 x - \ln x}$	$0 < x < e \wedge x \neq 1$
81	$\frac{1}{2(\log x - 1)} + \frac{3}{\log^2 x - 1} \leq \frac{1}{4}$	$0 < x \leq \frac{1}{10^3} \vee \frac{1}{10} < x < 10 \vee x \geq 10^5$
82	$\frac{\log_2 x}{\log_2 x + 3} - \frac{6}{\log_2 x - 3} + \frac{72}{9 - \log_2^2 x} < 0$	$\frac{1}{64} < x < \frac{1}{8} \vee 8 < x < 2^{15}$
83	$\frac{-\log x^4 - 7}{2 \log^2 x - 5 \log x + 2} \geq 0$	$0 < x \leq 10^{-\frac{7}{4}} \vee \sqrt{10} < x < 100$
84	$\frac{1 - x \ln 7 + x \ln 14}{\ln^2 \frac{x-2}{x+1} - 1} \geq 0$	$x < \frac{2+e}{1-e} \vee -\frac{1}{\ln 2} \leq x < -1 \vee 2 < x < \frac{1+2e}{e-1}$
85	$\frac{1 - 5 \ln^2 x}{16 \ln^2 x} < \frac{\ln^2 x + 2}{3}$	$0 < x < \frac{1}{\sqrt[4]{e}} \vee x > \sqrt[4]{e}$
86	$\frac{6}{\log_5(x-4) + 1} < \log_5(x-4)^3$	$\frac{101}{25} < x < \frac{21}{5} \vee x > 9$

87	$\frac{\ln(x-2)}{\sqrt{1+\ln(x-2)}} < 2$	$2 + \frac{1}{e} < x < 2 + e^{2+2\sqrt{2}}$
88	$\frac{\ln x + \ln(\ln x) - 1}{1 - \ln x} + 1 \leq 0$	$x > 1 \wedge x \neq e$
89	$\frac{\log_2 x - 2}{\log_2 x + 2} \geq \frac{2 \log_2 x - 3}{4 \log_2 x - 1}$	$0 < x < \frac{1}{4} \vee \sqrt[4]{2} < x \leq 2 \vee x \geq 16$
90	$\frac{2}{1 - 2 \ln x } + \frac{1}{\ln x + \ln 2} \leq \frac{1}{2 \ln 2x}$	$\frac{1}{4\sqrt{e}} \leq x < \frac{1}{2} \vee x > \sqrt{e}$
91	$\frac{\log_2 x + 1}{\log_2 x - 2} - \frac{\log_2 x + 2}{1 - \log_2 x} < 2$	$0 < x < 2 \vee 2\sqrt{2} < x < 4$
92	$\frac{(\ln x + 1)^3 - 1}{(\ln x - 1)^3 + 1} > 1$	$x > 1$
93	$\frac{\log x + \sqrt{\log x - 2}}{\log^2 x - 1} \geq 0$	$x \geq 100$
94	$\frac{2 + \log_2 x}{\log_2^2 x + \sqrt{4 - \log_2 x}} > 0$	$\frac{1}{4} < x \leq 16$
3. risolvere le seguenti disequazioni esponenziali e /o con logaritmi di basi diverse 		
95	$\left(\log_2(x^2 - 1) + \log_{\frac{1}{2}}(x^2 + 1) \right) (1 - 2 \log_3 x) \leq 0$	$1 < x \leq \sqrt{3}$

96	$\frac{3}{\ln 4^x} \leq 4 + x \log_{\frac{1}{2}} 4$	$x < 0$
97	$\log_2(x-4) - 3 > \frac{2}{\log_{\frac{1}{2}}(x-4)}$	$5 < x < 6 \vee x > 8$
98	$\frac{1}{\log_2 5^{x-2}} > -\frac{1}{x \log_4 3}$	$0 < x < \frac{4 \ln 5}{\ln 3 + 2 \ln 5} \vee x > 2$
99	$\frac{(x-1) \log_2 5 + 2 \log_5 2}{4 - \log^2 5^x} > 0$	$x < -\frac{2}{\ln 5} \vee \frac{\ln^2 5 - 2 \ln^2 2}{\ln^2 5} < x < \frac{2}{\ln 5}$
100	$\frac{2 \log_x x - 1}{\ln 2 + x \ln 3 - \ln 9^x} > 0$	$0 < x < \frac{\ln 2}{\ln 3}$
101	$\frac{2x \log 4 - x \log 2}{1 + \ln 3^{ x -1}} > 0$	$\frac{1 - \ln 3}{\ln 3} < x < 0 \vee x > 1 - \frac{1}{\ln 3}$
102	$\frac{3 \ln x \left(2 \log_2 x - \log_{\frac{1}{2}} x - \log_{\frac{1}{2}} 3 \right)}{\log_{\frac{1}{3}}(2-x) + \log_9(x+1)} > 0$	$\frac{1}{\sqrt[3]{3}} < x < \frac{1}{2}(5 - \sqrt{13}) \vee$ $1 < x < 2$
103	$\frac{(x+1) \ln 3^{-2} + \ln 9 - \ln 3}{x \ln 4} + 1 > 0$	$\frac{\ln 3}{2(\ln 2 - \ln 3)} < x < 0$
104	$\log_{\frac{x}{2}} 8 + \log_{\frac{x}{4}} 8 < \frac{\log_2 x^4}{\log_2 x^2 - 4}$	$0 < x < 2 \vee x > 4$
105	$\frac{[\log_5(16^x + 1) - 1]^{\frac{1}{3}}}{\log_{\frac{1}{4}}^2 3x - 2 \log_4 3x + 1} \leq 0$	$0 < x \leq \frac{1}{2}$

106	$\frac{\log_2 3^{2x} - \log_{\frac{1}{2}} 9 + \log_2 5^x}{1 - 2x \log 4} \geq 0$	$-\frac{2 \ln 3}{2 \ln 3 + \ln 5} \leq x < \frac{\ln 10}{4 \ln 2}$
107	$\frac{ x }{2 \ln 3^{-x} + \ln 4} > 2$	$\frac{4 \ln 2}{1 + 4 \ln 3} < x < \frac{\ln 2}{\ln 3}$
108	$\frac{ x - 2 \ln 3^{-x} - 2 \ln 9}{1 + 2x \log_2 3} \leq 0$	$x \leq 1 - \sqrt{5} \vee x > -\frac{\ln 2}{\ln 9}$
109	$\frac{1}{\log_2(x + 1)} + \log_{\frac{1}{2}}(x + 1) + \frac{3}{2} < 0$	$x < -3 \vee x > 3$
110	$\frac{(x - 1) \log 2 - \log 8^{x+1}}{(\ln 3^{-(x+2)} + 2x \ln 9)(1 + \log_2 7^x)} \geq 0$	$x < -1 \vee -\frac{\ln 2}{\ln 7} < x < \frac{2}{3}$

4. risolvere le seguenti disequazioni di riepilogo



111	$\frac{\ln x + 1}{\ln^2 x + 1} \geq 1$	$1 \leq x \leq e$
112	$\frac{1}{\log_2(x + 1)} - \log_4(x + 1) < \frac{1}{2}$	$-\frac{3}{4} < x < 0 \vee x > 1$
113	$\frac{6}{2 \log_2 x - 1} \geq \frac{5}{\log_2 x - 2}$	$0 < x \leq 2^{-\frac{7}{4}} \vee \sqrt{2} < x < 4$
114	$\frac{\log_2 x^2 + \log_2^2 x}{\log_2 x - 3 \log_2^2 x} > 0$	$\frac{1}{4} < x < 1 \vee 1 < x < \sqrt[3]{2}$

115	$\ln(7^x - 1) \ln(7^{x+1} - 7) > 0$	$0 < x < \frac{\ln 8}{\ln 7} - 1 \vee x > \frac{\ln 2}{\ln 7}$
116	$\frac{3}{\log_4 x} + \frac{3}{2 + \log_4 x} \geq -\frac{1}{\log_4 x + 1}$	$\frac{1}{16} < x \leq 4^{\frac{-7-\sqrt{7}}{7}} \vee \frac{1}{4} < x \leq 4^{\frac{-7+\sqrt{7}}{7}} \vee x > 1$
117	$\frac{4}{\log_9 x} - \left(2 - \frac{3}{\log_9 x}\right) - 2\left(1 - \frac{1}{\log_9 x}\right) < 14$	$0 < x < 1 \vee x > 3$
118	$\frac{6}{1 - \log_8^2 x} + \frac{3 \log_8 x}{\log_8 x + 1} \leq \frac{2 - \log_8 x}{\log_8 x - 1}$	$8 < x \leq 64$
119	$\frac{\log x + 3}{\log x - 3} - \frac{\log x - 3}{\log x + 3} > \frac{5 \log x}{\log^2 x - 9}$	$\frac{1}{10^3} < x < 1 \vee x > 10^3$
120	$\frac{\log x - 2}{\log x - 1} + \frac{\log x - 2}{\log x - 3} < \frac{\log^2 x - 4}{(\log x - 3)(1 - \log x)}$	$\sqrt[3]{10^2} < x < 10 \vee 10^2 < x < 10^3$
121	$\frac{\sqrt{2 \log x}}{3} + \frac{\log x}{\sqrt{\log x}} \leq 3 + \sqrt{2}$	$1 < x \leq 10^9$
122	$\frac{\sqrt{3 - 2 \log_2 x} - \log_2 x}{\ln \frac{x+1}{x}} \leq 0$	$2 \leq x \leq 2\sqrt{2}$
123	$\frac{3 \ln^2(x - 1) - \ln(x - 1)^5 - 2}{\log_4 x - 2 + \log_{\frac{1}{2}} x} < 0$	$1 < x < \frac{1 + \sqrt[3]{e}}{\sqrt[3]{e}} \vee x > 1 + e^2$

123	$\frac{\log_{\frac{1}{4}} x - \sqrt{\log_{\frac{1}{4}}^2 x - 2 \log_{\frac{1}{4}} x - 3}}{\log_{\frac{1}{4}}^2 x - \log_{\frac{1}{4}} x} \leq 0$	$x \geq 4$
125	$\frac{(1 + x \ln 2)(\log_3 x - \log_x 9)}{\log^2(x-1) + \log(x-1) - \log 10^6} < 0$	$1 < x < \frac{1+e^3}{e^3} \vee$ $3^{\sqrt{2}} < x < 1+e^2$
126	$\frac{\log_{\frac{1}{2}}(x - x) + \log_4(x-1) + \log_{\frac{1}{4}}(x+1)}{1 + 2x \ln 2} \geq 0$	$\emptyset$
127	$\frac{x \log 4^{2x-1} - \log 16 + \log 2^x}{\ln 10^{-x} - \ln 5^x + \ln 5} > 0$	$x < \frac{1}{8}(1 - \sqrt{65}) \vee$ $\frac{\ln 5}{\ln 2 + 2 \ln 5} < x < \frac{1}{8}(1 + \sqrt{65})$
128	$\frac{2 x \log e^{3-x} + \log \sqrt{e} - \frac{1}{3} \log e}{1 + 2\sqrt{x} \ln 10} \leq 0$	$x \geq \frac{3}{2} + \sqrt{\frac{7}{3}}$
129	$\frac{\log_{\frac{2}{3}}^2(1-x) - 1}{\log_{\frac{2}{3}}^2(1-x) - 9} - \frac{1}{\log_{\frac{1}{3}}(1-x) + 3} + \frac{\log_{\frac{1}{3}}(1-x) - 1}{\log_{\frac{1}{3}}(1-x) - 3} < 0$	$-26 < x < -2 \vee$ $1 - \frac{\sqrt{3}}{3} < x < \frac{26}{27}$
130	$\frac{5}{\log_{\frac{1}{2}}^2 x - 5 \log_{\frac{1}{2}} x + 6} - \frac{1}{\log_{\frac{1}{2}}^2 x - 3 \log_{\frac{1}{2}} x + 2} - \frac{3}{\log_{\frac{1}{2}}^2 x - 4 \log_{\frac{1}{2}} x + 3} < 0$	$\frac{1}{8} < x < \frac{1}{4} \vee \frac{1}{2} < x < 16$

