Equazioni logaritmiche

indice

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.

Logaritmi: equazioni

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

1	$log_3 x = 2$	9
2	$log_2 x = 0$	1
3	$log_3 x = 1$	3
4	$log_5 x = 2$	25
5	$log_1 x = 5$	*impossibile*
6	$log_0 x = 2$	*impossibile*
7	$log_{-2} x = 3$	*impossibile*
8	$log_{\frac{1}{2}} x = 3$	$\frac{1}{8}$
9	$log_{\frac{1}{3}} x = 4$	$\frac{1}{81}$
10	$log_{\frac{1}{10}} x = -3$	10^3
11	$log_5 x = \frac{1}{2}$	$\sqrt{5}$
12	$log_{\frac{1}{3}} x = \frac{1}{2}$	$\frac{\sqrt{3}}{3}$
13	$log_{\frac{1}{5}} x = -\frac{1}{3}$	$\sqrt[3]{5}$
14	$log_{\frac{1}{4}} x = -4$	4^4

Logaritmi: equazioni

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15	$log_{100}\, x = -\frac{1}{2}$	$\frac{1}{10}$
16	$log_{0,09}\, x = \frac{1}{2}$	$\frac{3}{10}$
17	$log_{\frac{27}{125}}\, x = -\frac{1}{3}$	$\frac{5}{3}$
18	$log_{\frac{32}{3}}\, x = -\frac{1}{5}$	$\frac{\sqrt[5]{3}}{2}$
19	$log\, x = 0{,}01$	$\sqrt[100]{10}$
20	$log_{\frac{2}{5}}\, x = -\frac{3}{4}$	$\frac{\sqrt[4]{250}}{2}$
21	$log_{\frac{8}{27}}\, x = -\frac{1}{3}$	$\frac{3}{2}$
22	$log_{25}\, x = -\frac{1}{2}$	$\frac{1}{5}$
23	$log_{\sqrt[4]{3}}\, x = 4$	3
24	$log_{\frac{3}{5}}\, x = 1$	$\frac{3}{5}$
25	$log_{0,8}\, x = -1$	$\frac{5}{4}$
26	$log_{0,0016}\, x = \frac{1}{4}$	$\frac{1}{5}$
27	$log_{\frac{3}{4}}\, x = -\frac{2}{3}$	$\frac{2\sqrt[3]{6}}{3}$
28	$log_{\frac{7}{6}}\, x = -\frac{3}{2}$	$\frac{6\sqrt{42}}{49}$

Logaritmi: equazioni

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29	$log_{\frac{3}{8}} x = -2$	$\frac{64}{9}$
30	$log_{\sqrt{2}} x = -2$	$\frac{1}{2}$
31	$log_{\frac{3}{4}} x = -\frac{3}{4}$	$\frac{2\sqrt[4]{12}}{3}$
32	$log_{\frac{1}{2}} x = -\frac{2}{3}$	$\sqrt[3]{4}$
33	$ln\, 2x = 3$	$\frac{e^3}{2}$
34	$2\, log\, x = 1$	$\sqrt{10}$
35	$log_{\frac{1}{3}} x + 3 = 0$	27
36	$log_{\frac{1}{3}}(x + 3) = 0$	-2
37	$ln(x + 2) = 0$	-1
38	$ln(x + 1) = -2$	$\frac{1}{e^2} - 1$
39	$log_3(2x - 1) = -1$	$\frac{2}{3}$
40	$log_{\frac{1}{2}}(x - 2) = 0$	3
41	$log_4(3x - 4) = -\frac{3}{2}$	$\frac{11}{8}$
42	$log_2(x - 1) = 3$	9

Logaritmi: equazioni

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43	$2 - log_3(3x - 7) = 0$	$\frac{16}{3}$
44	$log_{\frac{3}{2}} \frac{x-2}{3} = -2$	$\frac{10}{3}$
45	$log_5(x^2 + x + 1) = 1$	$\frac{-1 \pm \sqrt{17}}{2}$
46	$\sqrt{1 + log_{\sqrt{2}} x} = 3$	16
47	$log_{0,01}\left(\sqrt{x+1} + 2\right) = -\frac{1}{2}$	63
48	$log_4(2x - 1) = log_4 x$	1
49	$log_2(x - 1) + log_2 x = 0$	$\frac{1+\sqrt{5}}{2}$
50	$log(x - 3) - log(2x + 1) = 0$	*impossibile*
51	$log_2(x^2 + 4x + 3) - log_2(x + 1) = 0$	*impossibile*
52	$log \frac{x^2 - 1}{x} = log\ 2$	$1 \pm \sqrt{2}$
53	$log_3 \sqrt{x^2 - x} = log_3 \sqrt{2}$	$-1;\ 2$
54	$log_3(x + 4) = log_3(2 - x)$	-1
55	$log_5 \sqrt{x - 3} = \frac{1}{2} log_5(3x - 4)$	*impossibile*
56	$log_3(x - 1) = \frac{1}{2} log_3 x$	$\frac{3+\sqrt{5}}{2}$

Logaritmi: equazioni

57	$lnx = 2ln2x$	$\frac{1}{4}$
58	$log(3x-5) + log(x-2) = log\,2$	$\frac{8}{3}$
59	$log(x-2) - log(x-1) = log\,5$	*impossibile*
60	$2log_2\,x = 2 + log_2(x+3)$	6
61	$log(x-2) + log\,5 = log\,x$	$\frac{5}{2}$
62	$ln2x + ln\frac{x}{2} = ln4$	2
63	$ln\,2 + ln\,x = 2\,ln(4x-15)$	$\frac{9}{2}$
64	$log\,5 - log(2x-3) = 1$	$\frac{7}{4}$
65	$ln\,x + ln\,3 = ln(x^2+2)$	1; 2
66	$log_3(3x+1) - log_3\,x = 2$	$\frac{1}{6}$
67	$1 + log_3\,x - \frac{1}{2}log_3(10x-1) = 0$	$\frac{1}{9}$; 1
68	$log_3(x^2+3x-16) - log_3(x+3) = 1$	5
69	$\frac{1}{2}log(3x-1) + log\,3 = -log\,0.1$	$\frac{109}{27}$
70	$ln(x^2+12x+5) = ln\,2 + ln(x-10)$	*impossibile*

Logaritmi: equazioni

71	$log_{\frac{1}{3}} x - log_{\frac{1}{3}}(x-2) - 2\, log_{\frac{1}{3}} 3 = 0$	$\frac{9}{4}$
72	$log_{\sqrt{2}}(1+x^2) - log_{\sqrt{2}}(x+2) - 2 = 0$	$-1;\ 3$
73	$ln(28-x^3) - ln(7-x) = 2ln(4-x)$	$2;\ \frac{14}{5}$
74	$log(x-1) - 2\, log(x+1) - log\, 8 = -2$	$\frac{3}{2};\ 9$
75	$ln(x-2) - ln\, 3 = ln(5-x) - ln\, 2$	$\frac{19}{5}$
76	$ln(4x+5) + ln(x-2) = ln3 + ln(5-x)$	$\frac{5}{2}$
77	$ln\, 10 - ln(x-1) = ln\, 8 - ln(x+3)$	*impossibile*
78	$log(x-1) - log(x+1) + log(1-2x) = 0$	*impossibile*
79	$log_3 2 + log_3 x = log_3 \frac{1}{2} + log_3 \frac{1}{x}$	$\frac{1}{2}$
80	$log(10-x^2) - log\, 8 = 2\, log \frac{x}{5} - 2\, log \frac{\sqrt{2}}{5}$	$\sqrt{2}$
81	$log(x-1) - 2 \cdot log(x+1) - log\, 8 = -2$	*impossibile*
82	$log_2(x+1) + log_2 3 = log_2(x-1)$	-2
83	$log_4(x^2+2) - log_4(x^2-1) = log_4 5 - log_4(x+1)$	*impossibile*
84	$log_3(3x-1) + log_3(4-x) - 1 = log_3(x+2) + log_3(2-x)$	$\frac{16}{13}$

Logaritmi: equazioni

85	$\frac{1}{2}ln(x-1)+ln\sqrt{3}=\frac{1}{2}[ln(5x^2-20)-ln(x-2)]$	*impossibile*
86	$log_3 4+log_3 2+2\,log_3 x=log_3(x^2-3)+log_3(x^2+3)$	3
87	$3\,log_2(x+2)-3\,log_2(2x-1)+log_2 4-log_3 9=0$	3
88	$log(2x+2)-log(x-1)=1-[log(3x-2)-log\,x]$	$\frac{3+\sqrt{5}}{2}$
89	$log_{\frac{1}{3}}\,log_{\frac{1}{3}}(5x+9)=0$	$-\frac{26}{15}$
90	$log_2\,log_3\frac{3x-1}{x}=2$	$-\frac{1}{78}$
91	$log_{\frac{1}{3}}\,log_2(3x-1)=0$	1
92	$log_{2x}(x^2+1)=1$	1
93	$log_x 2=\frac{1}{\sqrt{2}}$	$2^{\sqrt{2}}$
94	$log_x 4=1$	4
95	$log_{x+1} 1=0$	$-1<x<0 \vee x>0$
96	$log_{x-2} 9=2$	5
97	$log_{\frac{1}{x}}-2=2$	*impossibile*
98	$log_{3-2x}\frac{1}{3}=-2$	$\frac{3-\sqrt{3}}{2}$

Logaritmi: equazioni

99	$log_x x = 0$	*impossibile*
100	$log_x(2x+3) = 2$	3
101	$2\,log_{3x-1} 4 = 1$	$\frac{17}{3}$
102	$log_{x-1}(7-3x) = 2$	*impossibile*
103	$log_x\|x-3\| = 1$	$\frac{3}{2}$
104	$log_{x+1}\|x^2+x\| = log_{x+1}\|x^2-3x+2\|$	$\frac{1}{2}$

2. risolvere le seguenti equazioni utilizzando anche una variabile ausiliaria

105	$log_2{}^2\, x - 4\,log_2 x + 4 = 0$	4
106	$log_2^2\, x - 4\,log_2 x + 3 = 0$	2; 8
107	$log_2^2 x - log_2 x^3 + 2 = 0$	2; 4
108	$log_2^2\, x + log_2 x - 12 = 0$	$\frac{1}{16}$; 8
109	$ln^2 x - 2\,ln x + 1 = 0$	e
110	$2\,log^2 x + 3 = 7\,log x$	10^3; $\sqrt{10}$
111	$3\,log^2 x + 5\,log x = 0$	1; $10^{-\frac{5}{3}}$

Logaritmi: equazioni

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112	$log_3^2 x + log_3 x - 12 = 0$	$27;\ \frac{1}{81}$
113	$-2ln^2 x + lnx + 1 = 0$	$e;\ \frac{1}{\sqrt{e}}$
114	$2\,log^2 x + 5\,log\,x - 3 = 0$	$10^{-3};\ \sqrt{10}$
115	$3\,log^2 x + log\,x = -4$	*impossibile*
116	$3(logx + 1) = 5\,log^2 x$	$10^{\frac{3-\sqrt{69}}{10}};\ 10^{\frac{3+\sqrt{69}}{10}}$
117	$3log_{\frac{1}{2}}^2 x - 11log_{\frac{1}{2}} x - 4 = 0$	$\sqrt[3]{2};\ \frac{1}{16}$
118	$4log_{\frac{1}{2}}^2 x - 5\,log_{\frac{1}{2}} x + 1 = 0$	$\frac{1}{2};\ \frac{\sqrt[4]{8}}{2}$
119	$3log_2^2 x - 7\,log_2 x + 2 = 0$	$\sqrt[3]{2};\ 4$
120	$3ln^2 x + 5\,ln\,x - 2 = 0$	$e^{-2};\ \sqrt[3]{e}$
121	$log_2{}^2 x + 95 = 8\sqrt{6}\,log_2 x$	$2^{4\sqrt{6}-1};\ 2^{4\sqrt{6}+1}$
122	$log^3 x + 2\,log^2 x - 3log\,x = 0$	$\frac{1}{1000};\ 1;\ 10$
123	$log_3{}^3 x - log_3{}^2 x - 2\,log_3 x = 0$	$\frac{1}{3};\ 1;\ 9$
124	$log^3 x - log\,x = 0$	$\frac{1}{10};\ 1;\ 10$

Logaritmi: equazioni

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125	$ln^3 x - 9lnx = 0$	$1;\ e^3;\ e^{-3}$
126	$log^3 x - log^2 x = 0$	$1;\ 10$
127	$5\,ln^3\sqrt{x} + 6\,ln^2\sqrt{x} - 9ln\sqrt{x} = 2$	$e^{-4};\ \frac{\sqrt[5]{e^3}}{e};\ e^2$
128	$log_3^2(x-1) - 2log_3(x-1) = 3$	$\frac{4}{3};\ 28$
129	$2ln^2(x-1) - 5\,ln(x-1) + 2 = 0$	$\sqrt{e}+1;\ e^2+1$
130	$log_3^2(x+2) - log_3(x+2) - 2 = 0$	$-\frac{5}{3};\ 7$
131	$ln^2(x^2-1) + 3ln(x^2-1) = 0$	$\pm\sqrt{1+\frac{1}{e^3}};\ \pm\sqrt{2}$
132	$(log_2 x^2)^2 + 9\,log_2 x + 2 = 0$	$\frac{1}{4};\ \frac{\sqrt[4]{8}}{2}$
133	$log\,x\,(log\,x+1) + 5\,log\,x = log^2 x + 4\,log\,x - 7$	$10^{-\frac{7}{2}}$
134	$log_3^2(4-x) - 2log_3(4-x) = 0$	$-5;\ 3$
135	$log_2 x^3\left(log_2 x + \frac{7}{3}\right) - 6 = 0$	$\frac{1}{8};\ \sqrt[3]{4}$
136	$3log_{\frac{1}{2}}^2 x - \left(log_{\frac{1}{2}} x - 1\right)^2 = 3$	$\frac{1}{2};\ 4$
137	$(2\,log\,x - 5)\,log\,x = 3 - log\,x$	$10^{\frac{2-\sqrt{10}}{2}};\ 10^{\frac{2+\sqrt{2}}{2}}$

Logaritmi: equazioni

138	$(log_2(3x+4)-1)^2 = log_2 2$	$-1;\ 0$
139	$log_{\frac{1}{2}}^2[x(x+4)] = log_{\frac{1}{2}}[x(x+4)]$	$-2 \pm \sqrt{5};\ -\frac{4 \pm 3\sqrt{2}}{2}$
140	$log_3 2x^2\,(log_3 2x^2 - 1) = log_3 2x^2 + 3$	$\pm\sqrt{\frac{27}{2}}\ ;\ \pm\sqrt{\frac{1}{6}}$
141	$log_3^2(2x^2 - x) = 1$	$-1;\ \frac{3}{2};\ \frac{3 \pm \sqrt{33}}{12}$
142	$log_2^4(2x-3) - 5log_2^2(2x-3) + 4 = 0$	$\frac{5}{2};\ \frac{7}{2};\ \frac{7}{4};\ \frac{13}{8}$
143	$\sqrt{ln\,x} = 1 - ln\,x$	$e^{\frac{3-\sqrt{5}}{2}}$
144	$ln^2 x + 2\lvert ln\,x\rvert = 15$	$e^{-3};\ e^3$
145	$log_{x-1}^2 3 - log_{x-1} 3 - 2 = 0$	$\frac{4}{3};\ 1+\sqrt{3}$
146	$log_{2x+1}^2 27 + log_{2x+1}\frac{1}{27} - 6 = 0$	$1;\ \frac{\sqrt{3}-9}{18}$

3. risolvere le seguenti equazioni con logaritmi di basi diverse

147	$log_2 x = log_3 9$	4
148	$log_{\frac{1}{2}} x + 8log_{49} 7 = 0$	16
149	$2\,log_2 x = log_{\frac{1}{4}} 3x$	$\sqrt[5]{\frac{1}{3}}$

Logaritmi: equazioni

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150	$log_3 x = log_4 64$	27
151	$2\, log_2 x = log_5 25$	2
152	$log_5 x - log_{25} x = 1$	25
153	$3\, log_9 x + log_3 x = 10$	81
154	$log_2 \frac{x}{2} - log_4 3x = 1$	48
155	$\frac{1}{2} log_3 x^2 + 2 = - log_{\frac{1}{3}} 2$	$\pm\frac{2}{9}$
156	$log_{\frac{1}{9}} x - log_{\frac{1}{3}} x + log_4 16 = 0$	$\frac{1}{81}$
157	$3log_9 x - log_{\frac{1}{3}} x = 2 - 2log_3 x$	$\sqrt[9]{81}$
158	$log_2 \sqrt[3]{x} - log_4 x + log_2 x^2 = 2$	$2\sqrt[11]{2}$
159	$log_5 \sqrt[16]{5} + 2log_{25} x - 3log_5 x = 0$	$\sqrt[32]{5}$
160	$log_2 x\sqrt{x} + 4log_4 \sqrt{x} - log_{16} x^{12} - 1 = 0$	$\frac{1}{4}$
161	$log_2(3 - 2x) - 2\, log_{\frac{1}{2}} x = 0$	1

Logaritmi: equazioni

162	$2\log_2(x+2)+\log_{\frac{1}{2}}x+1=0$	*impossibile*
163	$3\log_{\frac{1}{2}}x-2=\log_2(x^3-1)$	$\sqrt[3]{\frac{1+\sqrt{2}}{2}}$
164	$\log_2(x-2)-\log_4(3x-1)=1$	$8+2\sqrt{14}$
165	$2\log_{\frac{1}{3}}\left(\frac{1}{3}x-1\right)=2-\log_9 x^4$	*impossibile*
166	$\log_2 \ln(x+1)=1-\log_4 3$	$e^{\frac{2}{\sqrt{3}}}-1$
167	$\log_2(x+2x^2)-\log_3 9=1$	$\frac{-1\pm\sqrt{65}}{4}$
168	$\log_4(1-x^2)-\log_4(5x^2+3)=\log_2 x$	$\frac{\sqrt{5}}{5}$
169	$\log_{\frac{1}{4}}(x+1)+\log_{\sqrt{2}}x-\log_2 4x^2=0$	*impossibile*
170	$\log_2(x-2)-\log_2(3-2x)=\log_{\frac{1}{2}}4x$	*impossibile*
171	$\log_3^2(3x-1)-\log_{\frac{1}{3}}(3x-1)^4+3=0$	$\frac{4}{9};\ \frac{28}{81}$
172	$\log_{\frac{1}{2}}(x-1)-\log_2(x+1)=3$	$\frac{3\sqrt{2}}{4}$
173	$\log(3^{2x}+2)+\log_{\frac{1}{10}}(3^x-2)=1$	$\log_3 5+\sqrt{3}$

Logaritmi: equazioni

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174	$log_3(2x-1)+log_{\frac{1}{3}}(x-4)=-1$	*impossibile*
175	$log_3^2(x-2)+log_{\frac{1}{3}}(x-2)=6$	$\frac{19}{9};\ 29$
176	$log_2^2(2x+1)-log_{\frac{1}{2}}(2x+1)=0$	$0\ ;\ -\frac{1}{4}$
177	$-log_{\frac{1}{3}}(2x+5)\,(log_3(2x+5)-1)=2$	$-\frac{7}{3};\ 2$
178	$(2x-1)\,log_7 2=1+x\,log_{\frac{1}{7}}4$	$\frac{ln\,14}{ln\,16}$
179	$log_{\frac{1}{3}}^2(3x+1)+log_3(3x+1)^6=-9$	$-\frac{26}{81}$
180	$log_2(x-3)^2\,(log_2(x-3)-2)-log_{\frac{1}{2}}(x-3)=2$	$7;\ \frac{1}{\sqrt{2}}+3$
181	$2log_4^2\,x(x-1)+log_{\frac{1}{4}}[x(x-1)]^7+3=0$	$-1;\ 2\ ;\ \frac{1\pm\sqrt{257}}{2}$
182	$3log_8^2[x(x-2)]=1-2log_{\frac{1}{16}}[x(x-2)]$	$1\pm\sqrt{1+2^{\frac{3\pm\sqrt{57}}{4}}}$
183	$log_2\left(1+\sqrt{x+1}\right)+log_2\left(1-\sqrt{x+1}\right)=log_4(2-x)$	*impossibile*
184	$log_x 3=2\,log_{\frac{1}{x}+1}\sqrt{3}$	$\frac{1+\sqrt{5}}{2}$
185	$log_{x+2}4+log_4(x+2)=2$	2
186	$\frac{1}{5}log_3(x+1)-log_{x+1}3=\frac{4}{5}$	$-\frac{2}{3};\ 242$
187	$log_3(3x-1)+log_{3x-1}9=3$	$\frac{4}{3};\ \frac{10}{3}$

Logaritmi: equazioni

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4. risolvere le seguenti equazioni frazionarie - prodotto

188	$\frac{log_5(2x^2-x)}{log_5(x^2+4x)}=1$	5
189	$\frac{log_2 x}{log_2(x-1)}=2$	$\frac{3+\sqrt{5}}{2}$
190	$\frac{ln\, x+1}{ln^2 x+1}=1$	$1;\ e$
191	$\frac{log(10-x)}{log(4-x)}=2$	1
192	$(log\, x-3)(log\, x+3)=0$	$10^3;\ 10^{-3}$
193	$\left(\frac{1}{2}ln\, 2x-ln\, 3\right)\left(\frac{1}{ln\, x}-4\right)=0$	$\frac{9}{2};\ \sqrt[4]{e}$
194	$log_2(x-1)\,(3\, ln\, x-2)=0$	$2\,;\ \sqrt[3]{e^2}$
195	$\frac{log\, x-1}{log^2 x}-\frac{3}{log\, x}=1$	$\frac{1}{10}$
196	$\frac{5}{ln\, x+4}-\frac{3}{ln\, x-2}=4$	$e;\ e^{-\frac{5}{2}}$
197	$\frac{3}{log_2 x-1}+\frac{2}{log_2 x+1}=2$	$8;\ \frac{\sqrt{2}}{2}$
198	$\frac{1}{log\, x}+\frac{2}{log\, x+1}=2$	$\frac{\sqrt{10}}{10};\ 10$
199	$\frac{1}{log_{\frac{1}{8}} x}+\frac{1}{2+log_{\frac{1}{8}} x}=\frac{3}{4}$	$\frac{1}{64};\ 16$

Logaritmi: equazioni

200	$\frac{1+\log x}{\log x-1}-\frac{\log x+3}{2-2\log x}=\frac{11}{2}$	10^2
201	$\frac{1+\log x}{\log x-1}+\frac{\log x+3}{2-2\log x}=\frac{11}{2}$	$impossibile$
202	$\frac{4-2\log_4 x}{\log_4 x}=\frac{5+3\log_4 x}{3\log_4 x+5}$	$4^{\frac{4}{3}}$
203	$\frac{\log_a x}{\log_a x-1}-1=\frac{2}{1+\log_a x}$	$a^3 \wedge a>0 \wedge a\neq 1$
204	$\frac{3\log_2 x-1}{2\log_2 x+8}-\frac{2\log_2 x-3}{\log_2 x^4+4}=\frac{13}{40}$	$2;\ 2\sqrt[9]{128}$
205	$\frac{1}{ln^2 x-1}-\frac{1}{\ln x-1}-\frac{1}{\ln x+1}=0$	$\sqrt{e}$
206	$\frac{\log_2 x+1}{\log_2 x-2}-\frac{\log_2 x+2}{1-\log_2 x}=2$	$2\sqrt{2}$
207	$\frac{1}{2\log_2 x-2}+\frac{3}{{\log_2}^2 x-1}=\frac{1}{4}$	$\frac{1}{8};\ 32$
208	$2\log_2(x+3)+\frac{2}{\log_2(x+3)}=5$	$\sqrt{2}-3;\ 1$
209	$\frac{3}{\log_4 x}+\frac{3}{2+\log_4 x}=-\frac{1}{\log_4 x+1}$	$2^{\frac{-2\sqrt{7}\pm 2}{\sqrt{7}}}$
210	$\frac{\log_2 x}{\log_2 x+3}-\frac{6}{\log_2 x-3}+\frac{72}{9-{\log_2}^2 x}=0$	$\frac{1}{2^6};\ 2^{15}$

Logaritmi: equazioni

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211	$log_2(x-4)-3=\frac{2}{log_{\frac{1}{2}}(x-4)}$	6; 8
212	$\frac{6}{1-log_8{}^2\,x}+\frac{3\,log_8 x}{log_8 x+1}=\frac{2-log_8 x}{log_8 x-1}$	64
213	$\frac{log\,x+3}{log\,x-3}-\frac{log\,x-3}{log\,x+3}=\frac{5\,log\,x}{log^2 x-9}$	1
214	$\frac{\sqrt{2log\,x}}{3}+\frac{log\,x}{\sqrt{log\,x}}=3+\sqrt{2}$	10^9
215	$\frac{4}{log_9 x}-\left(2-\frac{3}{log_9 x}\right)-2\left(1-\frac{1}{log_9 x}\right)=14$	3
216	$\frac{log\,x-2}{log\,x-1}+\frac{log\,x-2}{log\,x-3}=\frac{log^2 x-4}{(log\,x-3)(1-log\,x)}$	10^2; $10^{\frac{2}{3}}$
217	$\frac{log^2_{\frac{1}{3}}(1-x)-1}{log^2_{\frac{1}{3}}(1-x)-9}-\frac{1}{log_{\frac{1}{3}}(1-x)+3}+\frac{log_{\frac{1}{3}}(1-x)-1}{log_{\frac{1}{3}}(1-x)-3}=0$	-2: $1-\frac{\sqrt{3}}{3}$
218	$\frac{5}{log^2_{\frac{1}{2}}x-5\,log_{\frac{1}{2}}x+6}-\frac{1}{log^2_{\frac{1}{2}}x-3\,log_{\frac{1}{2}}x+2}-\frac{3}{log^2_{\frac{1}{2}}x-4\,log_{\frac{1}{2}}x+3}=0$	16

5. risolvere le seguenti equazioni logaritmiche/esponenziali

219	$ln\,2^x=0$	0
220	$log_5\,7^x=1$	$log_7\,5$
221	$log_2\,3^x-2=0$	$\frac{ln\,4}{ln\,3}$

Logaritmi: equazioni

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222	$log_5 2^{x-1} = \frac{1}{4}$	$1 + \frac{1}{4\, log_5 2}$
223	$ln(1 - e^x) = 0$	*impossibile*
224	$ln\, 4^{x^2-6} - ln\, 64 = 0$	± 3
225	$log(e^x + e) = 2$	$\ln(100 - e)$
226	$2\, log_3 4^x = log_{\frac{1}{3}} 2^{-x}$	0
227	$ln\, 2^{\frac{x-1}{2}} - 1 = 0$	$1 + \frac{2}{ln\, 2}$
228	$2\, ln\, 3^{\frac{x-1}{3x+1}} = ln\, 9$	-1
229	$log(e^x + 1) = log(e^{2x} - 1)$	$\ln 2$
230	$ln(e^{2x} - 1) = ln(1 - e^x)$	*impossibile*
231	$log\left(5^{1+\sqrt{x}} + 5^{1-\sqrt{x}}\right) = 1$	0
232	$ln(2^{2x} - 9 \cdot 2^x + 21) = 0$	$2;\ \frac{ln\, 5}{ln\, 2}$
233	$log_3\left(9^{x+\frac{3}{2}} - 2\right) = x + 1$	-1
234	$log_2(4^x + 2^x) - log_2 2 = 0$	0
235	$log_2(2^x - 1)\, log_2(2^{x+1} - 2) = 0$	$1;\ \log_2 \frac{3}{2}$

Logaritmi: equazioni

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236	$1 - log\, 3^x = log\, 2^x$	$\frac{ln\, 10}{ln\, 6}$
237	$\frac{3}{2} ln\, 2^{x+1} - 2\, ln \frac{1}{2} = 1$	$\frac{1}{3}\left(\frac{2}{ln\, 2} - 7\right)$
238	$-2\, log\, 4^{2-x} + 5\, log\, 2^{x+1} = 1$	$log_{512} 80$
239	$ln\, 3^x + 2\, log_{3^x} e - 3 = 0$	$\frac{1}{ln\, 3}; \frac{2}{ln\, 3}$
240	$log(3^x + 1) + log(3^x - 1) = 2$	$\frac{1}{2} log_3 101$
241	$- ln\, 2^x + 2\, ln\, 3 = 1 - ln\, 4^{-x}$	$\frac{ln\, 9 - 1}{ln\, 8}$
242	$(x+1)\, ln\, 3 - ln \frac{1}{9} = 2\, ln \left(\frac{1}{3}\right)^x$	-1
243	$x log\, 2 - 3\, log_{2^x} 10 - 2 = 0$	$-\frac{ln\, 10}{ln\, 2}; \; 3\frac{ln\, 10}{ln\, 2}$
244	$3 - x + log_2\, 3^{2x+1} = 0$	$-\frac{ln\, 24}{ln\, 9 - ln\, 2}$
245	$2 - 3x\, log_4\, 3^x + 2(log_4\, 9 - log_4\, 4) = 0$	$\pm\frac{2}{3}\sqrt{3}$
246	$log_2(2^x + 1) + log_2{}^2(2^x + 1) - 2 = 0$	0
247	$log\, 5 + (x-2)\, log\, 4 = log(4^x - 11)$	2
248	$3\, log_2\, 2^x + 4\, log_4 \sqrt{2^x} = 1 + \frac{1}{2} log_2\, 2^{6x}$	1
249	$2\, log \sqrt[4]{2^x} = 3x\, log\, 2 - log\, 2 - log\, 2^{1-x} + log(4 \cdot 2^x)$	0
250	$x\, log_2\, 3 + log_2\, 5^x = (2x-1)\, log_2\, 5 - x\, log_2\, 5$	$-\frac{ln\, 5}{ln\, 3}$

Logaritmi: equazioni

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251	$log(2^{4x}-1)+2\,log\,3=(1-2x)\,log\,4$	$log_{16}\left(\frac{4}{3}\right)$
252	$log(4^x-1)+log\,2=log(2^{2x}+3\cdot 2^{x+1}-10)$	2
253	$\left((x+1)\,log\,3-1\right)(1+log\,3^{x+1})=0$	$-1\pm\frac{1}{log\,3}$
254	$ln\lvert 3^x-1\rvert=xln\,9$	$log_3\left(\frac{\sqrt{5}-1}{2}\right)$