

Disequazioni algebriche

risolvere le seguenti disequazioni algebriche

1	$\frac{x}{2} + \frac{x-1}{3} - 1 < 2x + \frac{7}{3}$	$x > -\frac{22}{7}$
2	$2x - \frac{1+3x}{2} - \frac{1}{2}(x-1) \leq 3x - \frac{x+6}{4}$	$x \geq \frac{6}{11}$
3	$\frac{2-x}{12} - \frac{1+3x}{4} + \frac{1}{4} - \frac{2x-2}{3} > 3 - \frac{x}{2}$	$x < -\frac{13}{6}$
4	$x - \frac{1}{3}x + \frac{x+3}{6} - \frac{x-1}{4} < 6$	$x < 9$
5	$2\left[\frac{5-2x}{4} - 3(x-1)\right] - 4 \leq \frac{5-7x}{2} + 3$	$x \geq -\frac{2}{7}$
6	$\frac{2x+3}{4} - 2x + \frac{3x+1}{3} \leq 1 - \frac{x+2}{12}$	$x \geq \frac{3}{5}$
7	$\frac{x-\frac{1}{3}}{2} - \frac{2x-\frac{1}{2}}{6} \geq \frac{2}{3}\left(\frac{2}{3}x+2\right) + \frac{2x-1}{3}$	$x \leq -\frac{9}{2}$
8	$\frac{2x-1}{3} + 2x - \frac{3}{2} > \frac{4x+1}{6} - 3\left(x+\frac{1}{2}\right)$	$x > \frac{1}{10}$
9	$\frac{2}{3}\left[3(x-2) + \frac{1-2x}{4} - \frac{1}{2}x\right] \leq x + \frac{1}{2}$	$x \leq 13$
10	$\frac{1}{2} - \frac{1}{3}[x - 2(1-3x)] < \frac{x-1}{6} - \frac{x+1}{5}$	$x > \frac{2}{3}$
11	$2\left[\frac{x-1}{6} + 4\left(\frac{1-2x}{3} + \frac{x}{2}\right)\right] + 2 < \frac{x-2}{3}$	$x > \frac{15}{4}$
12	$\frac{5}{4} - \frac{2-\frac{1}{2}x}{10} - \frac{3-\frac{2}{3}x}{2} < 1 - \frac{\frac{1}{2}-3x}{5}$	$x < \frac{7}{4}$
13	$\frac{3}{2} - \frac{1-x}{2-\frac{1}{2}} - \frac{3-x}{1+\frac{1}{2}} < \frac{2}{3}(1+6x) -$	$x > -\frac{1}{5}$
14	$\frac{3-x}{10} - \frac{3x-1}{2} < \frac{1}{5} - x$	$x > 1$

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15	$\frac{x-1}{2} - \frac{\frac{2-x}{3}}{\frac{1}{3}} - \frac{1-\frac{x}{2}}{2-\frac{1}{2}} > \frac{2x-1}{\frac{1}{2}+\frac{1}{3}} - \frac{x-\frac{1}{4}}{\frac{3}{4}}$	$x > 3$
16	$\frac{3}{4}x - \frac{\left(\frac{1}{3} + 2^{-1}\right)x}{(1-2^{-1})^{-1}} < \frac{3}{4}x + \frac{1}{2}$	$x > -\frac{6}{5}$
17	$\frac{x^2-2}{4} - \frac{x-1-\frac{1}{2}(2x-1)(2x+1)}{\frac{1}{2}} < \frac{4}{3}x^2 - \frac{2x-1}{3}$	<i>impossibile</i>
18	$(x-3)(x+1)(2x+3) > 0$	$-\frac{3}{2} < x < -1 \vee x > 3$
19	$\frac{(x-2)(5x+1)}{(x+1)} > 0$	$-1 < x < -\frac{1}{5} \vee x > 2$
20	$\frac{(3-x)(4x-1)}{2x(4x-3)} > 0$	$0 < x < \frac{1}{4} \vee \frac{3}{4} < x < 3$
21	$\frac{(4x-3)(2x-1)}{3x(6x-5)} < 0$	$\frac{3}{4} < x < \frac{5}{6} \vee 0 < x < \frac{1}{2}$
22	$\frac{(x^2-4)(x+1)}{(2-3x)(1-3x)} \geq 0$	$\frac{1}{3} < x < \frac{2}{3} \vee -2 \leq x < -1 \vee x \geq 2$
23	$ -2+5x < 3$	$-\frac{1}{5} < x < 1$
24	$ 3x-4 > 1$	$x < 1 \vee x > \frac{5}{3}$
25	$\frac{2}{ 2x-1 } < 3$	$x < \frac{1}{6} \vee x > \frac{5}{6}$
26	$\frac{3}{ 2x+1 } > 1$	$-2 < x < 1 \wedge x \neq -\frac{1}{2}$
27	$\left 2x - \frac{x-1}{3}\right < 2$	$-\frac{7}{5} < x < 1$
28	$\left \frac{x}{2} - \frac{1}{3}\right \leq 3$	$-\frac{16}{3} \leq x \leq \frac{20}{3}$

29	$\left \frac{x-2}{2x} - \frac{1}{4} \right > 2$	$-\frac{4}{7} < x < \frac{4}{9} \wedge x \neq 0$
30	$\left \frac{x-4}{x+2} \right > 2$	$-8 < x < 0 \wedge x \neq -2$
31	$\left \frac{x+3}{x} \right - 1 \leq 0$	$x \leq -\frac{3}{2}$
32	$\left \frac{2x-1}{x+1} - \frac{x-1}{2+2x} \right < \frac{1}{2}$	$0 < x < 1$
33	$\left \frac{2x-1}{4x-4} - \frac{3}{1-x} \right > \frac{1}{2}$	$x > -\frac{9}{4} \wedge x \neq 1$
34	$\frac{ 2x -4}{ x } < 4$	$\forall x \in \mathbb{R}$
35	$\frac{ x-2 -1}{2- x + x-1 } < 2$	$-5 < x < 5$
36	$\frac{2 x -1}{1- -x } > 0$	$-1 < x < -\frac{1}{2} \vee \frac{1}{2} < x < 1$
37	$ x-2 + x+3 - 2 x+1 - 2x > 2$	$x < \frac{1}{4}$
38	$2 x-1 - x-2 - x+3 + 2 x-4 > 0$	$x < \frac{5}{2} \vee x > \frac{11}{2}$
39	$ 2x - x-2 < 1$	$\frac{1}{3} < x < 1$
40	$ x-3 - 2x > 4$	$x < -\frac{1}{3} \vee x > 1$
41	$\frac{2x + x-1 }{2x-2} < 1$	$x < 1$
42	$\left \frac{2+ x }{3+ x } \right > \frac{1}{4}$	$\forall x \in \mathbb{R}$

43	$\left \frac{x - x - 1 }{x - 1} \right < 1$	$0 < x < \frac{2}{3} \vee x > 2 \wedge x \neq \frac{1}{2}$
45	$\frac{ x - 1 - x + 3}{ x + 2x - 4} > 0$	$x > \frac{4}{3}$
46	$\frac{x}{1 + \sqrt{5}} < \frac{x - 1}{1 - \sqrt{5}}$	$x < \frac{3 + \sqrt{3}}{6}$
47	$\frac{\sqrt{5}x + 1}{\sqrt{5} - 1} \geq \frac{2\sqrt{5} + x}{2\sqrt{5} + 1}$	$x \geq \frac{9 - 4\sqrt{5}}{11}$
48	$(x + \sqrt{a})^2 < (x + \sqrt{b})^2 - 2x(\sqrt{a} + \sqrt{b})$ con $a, b > 0, a > b$	$x > \frac{(b - a)\sqrt{a}}{4a}$
49	$\frac{x - 1 + \sqrt{2}}{x\sqrt{2}} < \frac{1}{2}$	$-\sqrt{2} < x < 0$
50	$\frac{1 - x}{2 - x} > \frac{1}{\sqrt{3}}$	$x < \frac{1 - \sqrt{3}}{2} \vee x > 2$
51	$\frac{x}{x - 1} + \frac{x - 1}{x + 1} < 3 - \frac{2}{x^2 - 1}$	$x < -3 \vee -1 < x < 1 \vee x > 2$
52	$(1 - 3x)(1 + x^2 + 2x)(x - 2x^2) < 0$	$x < 0 \vee \frac{1}{3} < x < \frac{1}{2} \wedge x \neq -1$
53	$\frac{x - (1 + x^2)}{4} + 1 > \frac{2 - x^2}{2}$	$-\frac{\sqrt{5} + 1}{2} < x < \frac{\sqrt{5} - 1}{2}$
54	$x - \frac{1 + 2x}{3} - \frac{(2 + x)(2 - x)}{5} < \frac{4}{15} + \frac{2 + x^2}{5}$	$x < \frac{27}{5}$
55	$\frac{x^2 - 9}{6} + \frac{1 + x^2}{3} \geq \frac{1}{2}(x + 4 + 2x^2)$	<i>impossibile</i>
56	$(1 + 4x)[4x^2 - (1 - 2x)^2] + 3 < 2(x + 1) + 2x(3 - x)$	$0 < x < \frac{4}{9}$
57	$\frac{x + 2}{x^2 + 2} + \frac{x - 2}{x^3 - 2x^2 + 2x - 4} > \frac{2}{x - 2}$	$x < 2$

58	$\frac{2}{x^2 + 7x + 12} - \frac{x+1}{x+3} - \frac{x-3}{x+4} \geq 0$	$-4 < x < -\frac{7}{2} \vee -3 < x \leq 1$
59	$\frac{x}{2x+1} < \frac{2-x^2}{4x^2+4x+1} + 3$	$x \neq -\frac{1}{2}$
60	$\frac{x^2+x+1}{2x^2-5x+3} - \frac{x-3}{2x-3} > \frac{x+2}{x-1}$	$\frac{3}{2} < x < \sqrt{3} + 1 \vee 1 - \sqrt{3} < x < 1$
61	$\frac{x^2}{1+x-2x^2} + \frac{x-2}{x-1} - \frac{x+2}{2x+1} > 0$	$x < -\frac{1}{2} \vee 0 < x < 1$
62	$\frac{x+2}{2x+1} - \frac{x-1}{4x^2-4x+1} \leq \frac{2}{1-4x^2}$	$-\sqrt{2} - 1 \leq x \leq \sqrt{2} - 1$
63	$\frac{x^2+2}{x^2-3} > -\frac{x^2-3}{x^2+3}$	$x < -\sqrt{2} \vee x > \sqrt{2}$
64	$(\sqrt{2}-1)x > \frac{2}{(1+\sqrt{2})x}$	$-\sqrt{2} < x < 0 \vee x > \sqrt{2}$
65	$\frac{x+2}{2-x} < \frac{2x+1}{2x-1}$	$x < -1 \vee \frac{1}{2} < x < 1 \vee x > 2$
66	$\frac{1}{2} + \frac{(x+2)(x+1)}{x-1} - \frac{3x+1}{3} < 0$	$-\frac{11}{25} < x < 1$
67	$\frac{x^2+1}{x^3-2x^2} - \frac{x+1}{x^2-2x} \geq \frac{2}{x-2}$	$\frac{1}{2} \leq x < 2 \vee x \leq -1$
68	$\frac{x^2-x-1}{x^3-27} - \frac{3}{x-3} < \frac{1+x}{x^2+3x+9}$	$x > 3$
69	$\frac{x-3}{x^2+3x+2} + \frac{x-2}{x^2+4x+3} \geq \frac{x^2-12}{x^3+6x^2+11x+6}$	$-3 < x < -2 \vee x \geq 1$
70	$\frac{x+1}{x^2+x-2} + \frac{x+2}{x^2-3x+2} > \frac{x^2-3}{x^4-2x^3-3x^2+8x-4}$	$-2 < x < -1 \vee x > 2$
71	$3x^2 - 5x - 1 + 3(x-1)(x+1) \geq 0$	$x \leq -\frac{1}{2} \vee x \geq \frac{4}{3}$

72	$\frac{x^2 - 3x - 4}{x^2 + x - 6} < \frac{2x - 1}{x - 2} - \frac{x + 2}{x + 3}$	$-3 < x < -\frac{5}{8} \vee x > 2$
73	$\frac{(x^3 - 27)(x^2 - 5x + 6)(3x - x^2)}{(x^2 + 3)(x^3 - 6x^2 + 12x - 8)} < 0$	$x < 0 \vee x > 3$
74	$\frac{(x - 5)^3(6x^3 - 5x^2)(4 + x^6)(x^3 - 3x)^2(x^2 - 5x^3)}{(x^2 - 2x - 8)(-3x + x^2)^2(-x + x^2 + 8)} > 0$	$x < -2 \vee \frac{1}{5} < x < \frac{5}{6} \vee 4 < x < 5$
75	$x - 1 < \sqrt{2x^2 - x - 1}$	$x \leq -\frac{1}{2} \vee x > 1$
76	$\sqrt{\frac{4 - x^2}{3 - x^2}} > 2$	$-\sqrt{3} < x < -\frac{2\sqrt{6}}{3} \vee \frac{2\sqrt{6}}{3} < x \leq \sqrt{3}$
77	$\sqrt{x^2 + 2x + 5} < 3x - 1$	$x > \frac{\sqrt{3} + 1}{2}$
78	$\frac{(x^2 + 5x)(2 + x - \sqrt{3x^2 + 6x})}{(-27 + x^3)(2x - x^2)(x^2 + 3)} \geq 0$	$-5 \leq x \leq -3 \vee 0 \leq x \leq 1 \vee x > 2 \vee x = -2$
79	$3 - x^2 - -x + x^2 > 0$	$-1 < x < \frac{3}{2}$
80	$\frac{1 - 4x + \sqrt{x^2 + 4}}{1 - x + \sqrt{x^2 + x + 2}} < 0$	$x > \frac{1}{15}(\sqrt{61} + 4)$
81	$\frac{(\sqrt{2x^2 - x - x + 1})(x^2 - 9)(2 - x^2 + x)}{(x^3 + 64)(x^4 - 81)(x - 2)} > 0$	$-4 < x < -1$
82	$\frac{5}{x^4 - 2x^2 + 1} + \frac{3}{x^4 - x^2} \geq 0$	$x \leq -\frac{\sqrt{6}}{4} \vee x \geq \frac{\sqrt{6}}{4}$
83	$\frac{x - 2 + \sqrt{2x^2 + 3}}{\sqrt{x^2 - 4}} < 0$	$-2 - \sqrt{5} < x < -2$
84	$\frac{2(x - 2) + 4(1 - x) - x + 1}{2x + 4(2 - x) - 3(4 - x)} > 0$	$\frac{1}{3} < x < 4$
85	$\frac{(2x - 3x^2)(x^3 + 8)(x^2 - 5x + 6)}{(x^2 - 2x + 1)(x^3 + 12x - 8 - 6x^2)} < 0$	$x < -2 \vee 0 < x < \frac{2}{3} \vee x > 3$

86	$2 x - 3 + 3x - 4 > 0$	$x > -2$
87	$ 2x - 5x^2 < 2 + 3x^2$	$\frac{1 - \sqrt{5}}{2} < x < \frac{\sqrt{5} + 1}{2}$
88	$\sqrt{ x^2 - 1 } < 2 - x$	$x < -1 \vee 1 < x < \frac{5}{4}$
89	$\sqrt{2} < \sqrt{ 3 - 2x }$	$x > \frac{5}{2}$
90	$ 1 + 3x < \sqrt{1 - 2x}$	$-\frac{8}{9} < x < 0$
91	$\sqrt{3 + x} < 1 + x $	$-3 \leq x < -2 \vee x > 1$
92	$\sqrt{ x^2 - 1 } < 1 - x$	$x < -1$
93	$\frac{2 + x}{3 - \sqrt{x^2 + 1}} > 0$	$x < -2\sqrt{2} \vee -2 < x < 2\sqrt{2}$
94	$\sqrt[3]{\frac{x + 1}{x^2 + 2}} < 2$	$\forall x \in \mathbb{R}$
95	$\sqrt[3]{\frac{3 + x}{2 - x^2}} < -1$	$\frac{1 - \sqrt{21}}{2} < x < -\sqrt{2} \vee \sqrt{2} < x < \frac{1 + \sqrt{21}}{2}$
96	$\sqrt[3]{\frac{x^4 + x^3}{x - 1}} - 1 - x > 0$	$-1 < x < \frac{1 - \sqrt{5}}{2} \vee 1 < x < \frac{1 + \sqrt{5}}{2}$
97	$\sqrt[3]{\frac{3 - 2x}{x - 3}} < \sqrt[3]{2x}$	$\frac{2 - \sqrt{10}}{2} < x < \frac{2 + \sqrt{10}}{2} \vee x > 3$
98	$\sqrt{\frac{x^2 - 1}{x^2 - 4}} > \sqrt{\frac{3}{x + 2}}$	$x > 2$
99	$\sqrt{x^2 - 7x + 10} < 5 + x$	$-\frac{15}{17} < x \leq 2 \vee x \geq 5$
100	$\sqrt{x^2 - 8x + 12} \leq x - 3$	$x \geq 6$