

Disequazioni di vario tipo

| più impegnative | | |
|-----------------|--|--|
| 1 | $x^2 + 5x + 4 < 5\sqrt{x^2 + 5x + 28}$ | $-9 < x < 4$ |
| 2 | $1 - \cos x \geq \sqrt{\sin x}$ | $\frac{\pi}{2} + 2k\pi \leq x \leq \pi + 2k\pi \cup x = 2k\pi$ |
| 3 | $\frac{1}{(x-1)^3} + \frac{1}{x^3} \leq 0$ | $x < 0 \cup \frac{1}{2} \leq x < 1$ |
| 4 | $\sqrt{\frac{x^2 + 8 x - 9}{x^2 - 1}} \geq x - 3$ | $x \leq \frac{5 + \sqrt{17}}{2}$ |
| 5 | $3 \log_{\frac{1}{2}}(x-1) < 2 \log_{\frac{1}{2}} x + \log_{\frac{1}{2}}(x-3)$ | $x > 3$ |
| 6 | $\frac{x^2 + 4x + 2}{x+1} > \sqrt{x^2}$ | $-2 < x < -1 \cup x > -\frac{1}{2}$ |
| 7 | $\sqrt{13^x - 5} \leq \sqrt{2(13^x + 12)} - \sqrt{13^x + 5}$ | $\log_{13} 5 \leq x \leq 1$ |
| 8 | $2\sin^2\left(x + \frac{\pi}{4}\right) + \sqrt{3}\cos 2x > 0$ | $-\frac{5}{12}\pi + k\pi < x < \frac{\pi}{2} + k\pi \cup$ $\frac{\pi}{2} + k\pi < x < \frac{3}{4}\pi + k\pi$ |
| 9 | $\sin 2x > \cos x$ | $\frac{\pi}{6} + 2k\pi < x < \frac{\pi}{2} + 2k\pi \cup$ $\frac{\pi}{2} + 2k\pi < x < \frac{5}{6}\pi + 2k\pi$ |
| 10 | $\sqrt{2 \log_2 x + 3} \geq \log_2 x$ | $\frac{1}{2\sqrt{2}} \leq x \leq 8$ |
| 11 | $ x - 3 < 2$ | $1 < x < 5$ |
| 12 | $x^4 + 5x^3 + x^2 - 11x + 4 \geq 0$ | $x \leq -4 \cup$ $-1 - \sqrt{2} \leq x \leq -1 + \sqrt{2} \cup x \geq 1$ |
| 13 | $2^x > 2 + 2^{-x}$ | $x > \log_2(\sqrt{2} + 1)$ |
| 14 | $x^3 - 11x^2 + 10x \leq 0$ | $x \leq 0 \cup 1 \leq x \leq 10$ |

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| 15 | $\frac{x^2 - 3x - 18}{x^3 - 12x^2 + 32x} \leq 0$ | $x \leq -3 \cup 0 < x < 4 \cup 6 \leq x < 8$ |
| 16 | $\frac{4}{x} - 3 > \frac{5}{2x - x^2}$ | $0 < x < \frac{1}{3} \cup 2 < x < 3$ |
| 17 | $\frac{a^x \sqrt{a^{2+x}}}{\sqrt[3]{a^{x-1}}} > a^2$ | $a \in (1, +\infty) \quad x > \frac{4}{7}$ $a \in (0, 1) \quad x < \frac{4}{7}$ |
| 18 | $(x+3)^3(4-x^2)^4(-x^2+6x-5)^5 \geq 0$ | $x \leq -3 \cup x = -2 \cup 1 \leq x \leq 5$ |
| 19 | $2x + 1 > \sqrt{4x^2 - 9x + 2}$ | $\frac{1}{13} < x \leq \frac{1}{4} \cup x \geq 2$ |
| 20 | $\operatorname{tg} x > \operatorname{cot} g x$ | $\frac{\pi}{4} + k\frac{\pi}{2} < x < \frac{\pi}{2} + k\frac{\pi}{2} \quad k \in \mathbb{Z}$ |
| 21 | $x^3 - 2x^2 - x + 2 \geq 0$ | $-1 \leq x \leq 1 \cup x \geq 2$ |
| 22 | $\frac{2e^{2x} - 6e^x + 2 + \frac{x}{ x }}{\sqrt{1 - (e^x - 1)^2}} \leq 0$ | $\ln\left(\frac{3 - \sqrt{7}}{2}\right) \leq x < \ln 2 \wedge x \neq 0$ |
| 23 | $\frac{(3 \ln x - 1) - 3\sqrt[3]{3 \ln x - 1} - 2}{\sqrt[3]{3 \ln x - 1}} \leq 0$ | $\sqrt[3]{e} < x \leq e^3$ |
| 24 | $-6x^2 - x + 1 > 0$ | $-\frac{1}{3} < x < \frac{1}{3}$ |
| 25 | $\cos(x + x) > 0$ | $x < 0 \cup -\frac{\pi}{4} + k\pi < x < \frac{\pi}{4} + k\pi$ |
| 26 | $\sqrt{\frac{2}{x}} + 1 + x < 1$ | $-(1 + \sqrt{3}) < x \leq -2$ |
| 27 | $\frac{\cos x + 2\cos^2 x + \cos 3x}{\cos x + 2\cos^2 x - 1} > 1$ | $-\frac{\pi}{3} + 2k\pi < x < \frac{\pi}{3} + 2k\pi$ |
| 28 | $\frac{\ln(x-2)}{\sqrt{1 + \ln(x-2)}} < 2$ | $2 + \frac{1}{e} < x < 2 + e^{2(1+\sqrt{2})}$ |

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| 29 | $\left \frac{3^{2x} - 1}{3^{2x} + 1} \right < 1$ | $\forall x \in \mathcal{R}$ |
| 30 | $\frac{1 - 2\operatorname{sen}x}{1 + 2\operatorname{cos}x} \leq 0$ | $-\pi + 2k\pi < x < -\frac{2}{3}\pi + 2k\pi \cup$ $\frac{\pi}{6} + 2k\pi \leq x < \frac{2}{3}\pi + 2k\pi \cup$ $\frac{5}{6}\pi + 2k\pi \leq x \leq \pi + 2k\pi$ |
| 31 | $\frac{\operatorname{sen}x}{\sqrt{1 - 2\operatorname{sen}x}} > 1, \quad x \in [0, 2\pi]$ | $\frac{\pi}{8} + 2k\pi < x < \frac{\pi}{6} + 2k\pi \cup$ $\frac{5}{6}\pi + 2k\pi < x < \frac{7}{8}\pi + 2k\pi$ |
| 32 | $\frac{\log_3 x - 2 }{\frac{10}{x^2 - 4x}} < 0$ | $x < 0 \cup 1 < x < 2$ $2 < x < 3 \cup x > 4$ |
| 33 | $6\operatorname{sen}^2x - \operatorname{sen}x \operatorname{cos}x - \operatorname{cos}^2x > 2$ | $\frac{\pi}{4} + k\pi < x < \pi - \operatorname{arctg} \frac{3}{4} + k\pi$ |
| 34 | $\frac{\sqrt{ 1 - e^x - 1}}{e^x - 4} \geq 1$ | $\ln 4 < x \leq \ln 6$ |
| 35 | $\frac{\operatorname{tg}^2x - \sqrt{3}\operatorname{tg}x}{\operatorname{tg}^2x - 1} < 1, \quad x \in [0, \pi]$ | $0 \leq x < \frac{\pi}{6} \cup \frac{\pi}{4} < x < \frac{\pi}{2} \cup \frac{3}{4}\pi < x \leq \pi$ |
| 36 | $\frac{1 - \ln(x^2 + x)}{\ln(x - 1)^2 - 1} \geq -1$ | $x < -1 \cup \frac{1}{3} \leq x < 1 + \sqrt{e}$ |
| 37 | $2\sqrt{\frac{x^2 - 4}{2x^2 - 5x + 3}} < \sqrt{2}$ | $\frac{-5 - \sqrt{177}}{4} < x \leq -2$ $\cup 2 \leq x < \frac{-5 + \sqrt{177}}{4}$ |
| 38 | $\frac{3x + 1 - 5 - x }{x + 2 + \sqrt{4 - x}} \geq 0$ | $x < -5 \cup 1 \leq x \leq 4$ |
| 39 | $\frac{\operatorname{cos}2\sqrt{x} - \operatorname{sen}\sqrt{x}}{\operatorname{sen}2\sqrt{x} - \operatorname{sen}\sqrt{x}} \leq 1, \quad x \in [0, 4\pi]$ | $\frac{\pi^2}{64} \leq x < \frac{\pi^2}{9} \cup \frac{25}{64}\pi^2 \leq x < \pi^2$ $\cup \frac{81}{64}\pi^2 \leq x \leq \frac{169}{64}\pi^2 \cup$ $\frac{25}{9}\pi^2 < x < 4\pi^2$ |
| 40 | $\ln \frac{\sqrt[3]{x^2} - 4}{\sqrt[3]{x} - 1} \leq \ln \sqrt[3]{ x }$ | $8 < x \leq 64$ |
| 41 | $\log_{\frac{1}{2}} \frac{\sqrt[3]{x} + 2}{\sqrt[3]{x} - 1} \geq \log_{\frac{1}{2}} (\sqrt[3]{x} + 3)$ | $x \geq -8 + 3\sqrt{21}$ |

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| 42 | $\frac{\cos^2 2x}{\cos^2 x} \geq 3 \operatorname{tg} x$ | $-\frac{7}{12}\pi - k\pi \leq x < -\frac{\pi}{2} + k\pi$ $\cup -\frac{\pi}{2} + k\pi < x \leq \frac{\pi}{12} + k\pi$ |
| 43 | $\sqrt[3]{8x^3 - 32x^2 + 65x - 21} > 2x - 3$ | $x < -2 \cup x > -\frac{3}{4}$ |
| 44 | $\frac{5 + x + \sqrt{1-x}}{x^2 - 1} > \frac{2}{x-1}$ | $x < -1$ |
| 45 | $\frac{\ln(x - 1)}{x} < 0$ | $x < -2 \cup 1 < x < 2$ |
| 46 | $\sqrt{2x + \sqrt{6x^2}} < x + 1$ | $-\frac{\sqrt{3}-1}{\sqrt{2}} < x < \frac{\sqrt{3}-1}{\sqrt{2}}$ $\cup x > \frac{\sqrt{3}+1}{\sqrt{2}}$ |
| 47 | $\frac{2^{x+1} - 7}{x-1} < \frac{10}{3-2x}$ | $1 < x < \frac{3}{2}$ |
| 48 | $\frac{\sqrt{x^2 + 4x + 4} - 2x - 1 }{1 - \sqrt[3]{x^2 - 8}} < 0$ | $-3 < x < -2\sqrt{2}$ |
| 49 | $\frac{\log_2(\sqrt{4x+5} - 1)}{\log_2(\sqrt{4x+5} + 11)} > \frac{1}{2}$ | $x > 5$ |
| 50 | $ x-1 ^{\log_2(4-x)} > x-1 ^{\log_2(1+x)}$ | $-1 < x < 0 \cup \frac{3}{2} < x < 2$ |
| 51 | $\frac{3 - x^2 - 4 }{\sqrt[3]{x^3 - 8}} \leq 0$ | $x \geq \sqrt{7}$ |
| 52 | $\frac{\ln \cos x }{\cos^2 x - \cos x + 1} \geq 0$ | $x = k\pi$ |
| 53 | $\frac{e^{2x} - e^x}{2e^{2x} - 5e^x + 2} > -1$ | $x < \ln \frac{3-\sqrt{3}}{3} \cup$ $\ln \frac{1}{2} < x < \ln \frac{3+\sqrt{3}}{3} \cup x > \ln 2$ |
| 54 | $\log(\sqrt{ x } - 1) < \log 2$ | $-9 < x < -1 \cup 1 < x < 9$ |