# Disequazioni esponenziali

| disequazioni esponenziali risolubili mediante applicazione delle proprietà delle potenze | | |
|---|---|---|
| 1 | $3^x > 81$ | $x > 4$ |
| 2 | $16^{x^2+x} < 4$ | $-\frac{\sqrt{3}+1}{2} < x < \frac{\sqrt{3}-1}{2}$ |
| 3 | $\left(\frac{1}{4}\right)^x < 0$ | *impossibile* |
| 4 | $\left(\frac{1}{7}\right)^{3x+2} < 49$ | $x > -\frac{4}{3}$ |
| 5 | $2^x \geq 6$ | $x \geq log_2 6$ |
| 6 | $1 - 5^{2+x} \geq 0$ | $x \leq -2$ |
| 7 | $\left(\frac{1}{49}\right)^x < 343$ | $x > -\frac{3}{2}$ |
| 8 | $\left(\frac{1}{5}\right)^{\sqrt{x}} > 25$ | *impossibile* |
| 9 | $\left(\frac{1}{25}\right)^x > 625$ | $x < -2$ |
| 10 | $2^x > \frac{1}{64}$ | $x > -6$ |
| 11 | $3^{\sqrt{x^2-9}} \geq 1$ | $x \leq -3 \cup x \geq 3$ |
| 12 | $\left(\frac{1}{2}\right)^{\sqrt{3x-2}} > 4^{1-x}$ | $x > 2$ |
| 13 | $5^x > 25$ | $x > 2$ |
| 14 | $5^x \geq \frac{1}{25}$ | $x \geq -2$ |
| 15 | $5^{-2x^2+x+2} < 5^{(2-x)^2}$ | $x < \frac{2}{3} \cup x > 1$ |
| 16 | $2^{9x+5} > 2^{x-7}$ | $x > -\frac{3}{2}$ |
| 17 | $\left(\frac{1}{2}\right)^x \leq -1$ | *impossibile* |
| 18 | $3^{2x} - 1 < 0$ | $x < 0$ |
| 19 | $2^{3x} - 4 > 0$ | $x > \frac{2}{3}$ |
| 20 | $\left(\frac{1}{2}\right)^{2x} - 8 < 0$ | $x > -\frac{3}{2}$ |
| 21 | $5^{3x} + 1 > 0$ | $\forall x \in \mathbb{R}$ |

# Disequazioni esponenziali

| | | |
|---|---|---|
| 22 | $\left(\frac{2}{3}\right)^{\frac{x}{2}} - \frac{9}{4} > 0$ | $x < -4$ |
| 23 | $\left(3^{\frac{2}{3}x} - 9\right)(2^{-x} + 1) > 0$ | $x > 3$ |
| 24 | $4^{2x^2+1} - 16 > 0$ | $x < -\frac{\sqrt{2}}{2} \cup x > \frac{\sqrt{2}}{2}$ |
| 25 | $\left(\frac{2}{3}\right)^{x^2+2} - \left(\frac{27}{8}\right)^{x} < 0$ | $x < -2 \cup x > -1$ |
| 26 | $5^{\frac{2x-1}{2}} - \left(\frac{1}{25}\right)^{\frac{x+4}{x}} > 0$ | $x > 0$ |
| 27 | $\left(\frac{1}{4}\right)^{-\frac{x}{x+1}} - 16^{\frac{x}{x-1}} < 0$ | $x < -3 \cup -1 < x < 0 \cup x > 1$ |
| 28 | $3^{\frac{2x^2-3}{2x-1}} - \frac{1}{3} < 0$ | $x < -2 \cup \frac{1}{2} < x < 1$ |
| 29 | $\frac{2^{3x}}{4^{x+1}} - \left(\frac{1}{2}\right)^{x} > 0$ | $x > 1$ |
| 30 | $\frac{5^{2-x}}{125^{\frac{1}{x}}} < \left(\frac{1}{25}\right)^{x}$ | $x < -3 \cup 0 < x < 1$ |
| 31 | $\sqrt[3]{2^{6x}} < \frac{1}{4}16^{x^2-1}$ | $x < -1 \cup x > \frac{3}{2}$ |
| 32 | $1 \leq 3^{2x-1} \leq 9$ | $\frac{1}{2} \leq x \leq \frac{3}{2}$ |
| 33 | $-\frac{1}{2} \leq 4^{x} \leq 16^{\frac{1}{x}}$ | $x \leq -\sqrt{2} \cup 0 < x \leq \sqrt{2}$ |
| 34 | $\sqrt{3}^{x} \leq \left(\frac{1}{9}\right)^{\frac{1}{x^2}} \leq \frac{1}{3}$ | *impossibile* |
| 35 | $\frac{2^{-3x^2} - \frac{1}{2}}{3^{x} - 1} \geq 0$ | $x \leq -\frac{\sqrt{3}}{3} \cup 0 < x \leq \frac{\sqrt{3}}{3}$ |
| 36 | $\frac{\left(\frac{1}{4}\right)^{x}(3^{2x} - 27)}{8^{x}} < 0$ | $x < \frac{3}{2}$ |
| 37 | $\frac{\left(\left(\frac{1}{2}\right)^{\sqrt{x}} - 1\right)(3^{3x^2} - 27)}{2^{3x-4} - \frac{1}{4}} > 0$ | $\frac{2}{3} < x < 1$ |

| equazioni esponenziali risolubili mediante una posizione | | |
|---|---|---|
| 38 | $3^{2x} - 3^{x+1} + 2 < 0$ | $0 < x < \frac{\ln 2}{\ln 3}$ |
| 39 | $25^{x} + 5^{x} - 30 < 0$ | $x < 1$ |

# Disequazioni esponenziali

| | | |
|---|---|---|
| 40 | $7 \cdot 2^{2x} + 20 \cdot 2^x - 3 > 0$ | $x > -\frac{ln\,9}{ln\,2}$ |
| 41 | $3^{2x} - 6 \cdot 3^x - 6 \cdot 3^{-x} + 11 > 0$ | $0 < x < \frac{ln\,2}{ln\,3} \cup x > 1$ |
| 42 | $5^{x+2} + 25^{x+1} > 750$ | $x > 1$ |
| 43 | $32 \cdot \left(\frac{1}{2}\right)^{2x} < 1 + 4 \cdot \left(\frac{1}{2}\right)^{x}$ | $x > 2$ |
| 44 | $9^x - 3^{x+1} + 2 < 0$ | $0 < x < log_3 2$ |
| 45 | $\frac{3^x - 1}{9 - 3^x} \leq 0$ | $x \leq 0 \cup x > 2$ |
| 46 | $\frac{5^x - 3}{5^x + 2} < 5^x + 1$ | $\forall x \in \mathcal{R}$ |
| 47 | $(7^x + 7)(7^x + 2) \geq 0$ | $\forall x \in \mathcal{R}$ |
| 48 | $\frac{3^{2x} - 3^x}{3^{2x} + 3^x} \geq 0$ | $x \geq 0$ |
| 49 | $2^{\sqrt{6x - x^2}} < 2^{3-2x}$ | $0 \leq x < \frac{3}{5}$ |
| 50 | $\frac{2^x - 1}{2^x - 2} > 0$ | $x < 0 \cup x > 1$ |
| 51 | $3^x + 3^{x+2} - 3^{x-1} < 87$ | $x < 2$ |
| 52 | $3^{2x} - 10 \cdot 3^x + 9 < 0$ | $0 < x < 2$ |
| 53 | $3^{2x} - 5 \cdot 3^x + 6 \geq 0$ | $x \leq log_3 2 \cup x \geq 1$ |
| 54 | $2^{2x} - 10 \cdot 2^x + 16 < 0$ | $1 < x < 3$ |
| 55 | $2^x + 3 \cdot 2^{1-x} \geq 5$ | $x \leq 1 \cup x \geq \frac{log3}{log2}$ |
| 56 | $3^{2x} - 3^{x-1} \geq 0$ | $x \geq -1$ |
| 57 | $2^{2x} - 3 \cdot 2^x + 2 > 0$ | $x < 0 \cup x > 1$ |
| 58 | $5^{2x} - 26 \cdot 5^x + 25 < 0$ | $0 < x < 2$ |
| 59 | $\left(\frac{1}{3}\right)^{2x-3} - 4 \cdot \left(\frac{1}{3}\right)^{x-1} + 1 \leq 0$ | $1 \leq x \leq 2$ |
| 60 | $\left(\frac{1}{2}\right)^{2x} - 3\left(\frac{1}{2}\right)^{x} - 4 > 0$ | $x < -2$ |

# Disequazioni esponenziali

| | | |
|---|---|---|
| 61 | $4^{x+1} - 17 \cdot 2^x + 4 > 0$ | $x < -2 \cup x > 2$ |
| 62 | $9^x - 3^x \leq 0$ | $x \leq 0$ |
| 63 | $4^{-x} + \left(\frac{1}{2}\right)^x - 2 > 0$ | $x < 0$ |
| 64 | $\left(\frac{1}{49}\right)^x - 6 \cdot 7^{-x} - 7 \leq 0$ | $x \geq -1$ |
| 65 | $3^x - 2\left(\sqrt{3}\right)^x - 3 > 0$ | $x > 2$ |
| 66 | $\left(\frac{1}{3}\right)^{\frac{x+1}{2}} - 7\left(\frac{1}{3}\right)^{\frac{x+1}{4}} - 18 < 0$ | $x > -9$ |
| 67 | $4^{-x^2} - 7\left(\frac{1}{2}\right)^{x^2} - 8 \geq 0$ | *impossibile* |
| 68 | $4^x - 2^{x+1} + 1 > 0$ | $\forall x \in \mathbb{R} - \{0\}$ |
| 69 | $\frac{2^x - 1}{2^x + 1} - 2^x > 0$ | *impossibile* |
| 70 | $\frac{3^{2x} + 1}{1 - 3^x} + 2 > 0$ | $x < 0$ |
| 71 | $3^{3-x} - \left(\frac{1}{3}\right)^{\frac{x-2}{2}} < 0$ | $x > 4$ |
| 72 | $4^{2x} - 15\left(\frac{1}{2}\right)^{-2x} - 16 \leq 0$ | $x \leq 2$ |
| 73 | $\frac{2^{x-1} - 2^{\frac{x+1}{2}} - 8}{9^x - 4 \cdot 3^x + 3} > 0$ | $0 < x < 1 \cup x > 5$ |
| 74 | $\frac{3^{1-2x} - 10\left(\frac{1}{3}\right)^x + 3}{\sqrt{3}^{x-1} + 1} > 0$ | $x < -1 \cup x > 1$ |
| 75 | $\frac{\left(\frac{1}{5}\right)^{2(x^2-2)} - 126\left(\frac{1}{5}\right)^{x^2-1} + 5}{(3^x + 2)(9^x - 3^x)} \leq 0$ | $x \leq -\sqrt{3} \cup 0 < x \leq \sqrt{3}$ |

## equazioni esponenziali con basi diverse risolubili mediante logaritmi

| | | |
|---|---|---|
| 76 | $2^{2+x} > 3^x$ | $x < \frac{2}{log_2 3 - 1}$ |
| 77 | $3^{x+2} - 5^x \geq 3^x$ | $x \leq \frac{ln\, 8}{ln\, 5 - ln\, 3}$ |
| 78 | $27^x \cdot 5^{3x-2} < 9^{x+1}$ | $x < \frac{2\, ln\, 15}{ln\, 375}$ |
| 79 | $\frac{1}{7^x} > 100^{1-2x}$ | $x > \frac{2}{4 - log\, 7}$ |

# Disequazioni esponenziali

| | | |
|---|---|---|
| 80 | $3 \cdot 5^x + 5 \cdot 3^{2x} < 2 \cdot 9^{x+1}$ | $x > \frac{ln\,13 - ln\,3}{ln\,5 - ln\,9}$ |
| 81 | $\left(\frac{1}{9}\right)^x > 5^x$ | $x < 0$ |
| 82 | $3(e^{2x} - 3^x) > e^{2x} + 5 \cdot 3^x$ | $x > \frac{ln\,4}{2 - ln\,3}$ |
| 83 | $20 \cdot 3^x - 2^x > 2 \cdot 3^x + 2^{x+1}$ | $x > \frac{ln\,6}{ln\,2 - ln\,3}$ |
| 84 | $5^{2x} > 7^x$ | $x > 0$ |
| 85 | $3^{\sqrt{3x+1}} < \frac{5^x}{125}$ | $x > 5.97$ |
| 86 | $2^{\sqrt{x^2+x+1}} \leq 3^x$ | $x > 1.21$ |
| 87 | $3^{2x} > 3 \cdot 7^x$ | $x > \frac{ln\,3}{ln\,9 - ln\,7}$ |
| 88 | $\sqrt{3}\left(\frac{1}{5}\right)^{2x} \leq \sqrt{21}$ | $x \geq -\frac{1}{4}\frac{ln\,7}{ln\,5}$ |
| 89 | $\left(\frac{1}{2}\right)^x \leq 7$ | $x \geq log_2 \frac{1}{7}$ |
| 90 | $10^{\sqrt{2x+4}} > 4^x$ | $-2 \leq x < \frac{1 + \sqrt{1 + 4\,log^2\,4}}{log^2\,4}$ |
| 91 | $3^x > 2$ | $x > \frac{ln\,2}{ln\,3}$ |
| 92 | $2^{3x} \leq 5$ | $x \leq \frac{ln\,5}{3\,ln\,2}$ |
| 93 | $\left(\frac{1}{3}\right)^{x+1} > 4$ | $x < -\left(1 + \frac{ln\,4}{ln\,3}\right)$ |
| 94 | $\left(\frac{1}{2}\right)^x - 3 < 0$ | $x > -\frac{ln\,3}{ln\,2}$ |
| 95 | $7 - 4^{\frac{x}{2}-1} \leq 0$ | $x \geq 2\left(\frac{ln\,7}{ln\,4} + 1\right)$ |
| 96 | $2^{x-1} > \frac{1}{2\sqrt[5]{3}}$ | $x > -\frac{ln\,3}{5\,ln\,2}$ |
| 97 | $\left(\frac{2}{3}\right)^{2x-1} > \frac{10}{\sqrt{2}}$ | $x < \frac{1}{2}\left(1 + \frac{1}{2}\frac{2\,ln\,10 - ln\,2}{ln\,2 - ln\,3}\right)$ |
| 98 | $2^x > \frac{7}{3^{2x+1}}$ | $x > \frac{ln\,7 - ln\,3}{ln\,18}$ |
| 99 | $\sqrt{3}^{2x+4} > 2^x$ | $x > -\frac{ln\,9}{ln\,3 - ln\,2}$ |
| 100 | $\left(\frac{1}{\sqrt{2}}\right)^{x-4} \geq 3^{x+1}$ | $x \leq \frac{ln\,16 - ln\,9}{ln\,18}$ |

# Disequazioni esponenziali

| | | |
|---|---|---|
| 101 | $3^{\frac{x-1}{2}}+2<0$ | *impossibile* |
| 102 | $2^{3x-1}-\sqrt{7}\cdot 7^{x}>0$ | $x>\frac{ln\,28}{ln\,64-ln\,49}$ |
| 103 | $\frac{2^{3x-1}\cdot 5^{-x}}{3^{2x+3}}>\frac{1}{2}$ | $x<-\frac{3\,ln\,3}{ln\,45-ln\,8}$ |
| 104 | $\frac{2^{x-1}\sqrt{5}}{\left(\sqrt{10}\right)^{x}}\geq 5^{1-x}$ | $x\geq\frac{ln\,20}{ln\,10}$ |
| 105 | $\frac{2^{x-1}\cdot\sqrt{3}^{x+1}}{3}<\left(\frac{1}{2}\right)^{x}$ | $x<\frac{ln\,12}{ln\,48}$ |
| 106 | $\frac{3^{2x-1}-4^{x}}{6^{\sqrt{x}}-2}>0$ | $0\leq x<\left(\frac{ln\,2}{ln\,6}\right)^{2}\cup x>\frac{ln\,3}{ln\,9-ln\,4}$ |
| 107 | $\frac{\left(3\cdot 4^{x-\sqrt{2}}+1\right)\left(5^{\frac{2x-1}{3}}-3^{x}\right)}{\sqrt{2}\cdot 2^{x+2}-3^{-x}}<0$ | $x<-\frac{ln\,5}{ln\,27-ln\,25}\ \cup\ x>-\frac{5\,ln\,2}{ln\,36}$ |
| 108 | $2^{x+1}\leq 3^{-x}\leq 2\cdot 5^{\frac{x+2}{3}}$ | $-\frac{3\,ln\,2+2\,ln\,5}{3\,ln\,3+ln\,5}\leq x\leq-\frac{ln\,2}{ln\,2+ln\,3}$ |
| 109 | $5\cdot\left(\frac{1}{2}\right)^{2x-1}<9^{x+\frac{1}{2}}<4^{-x-1}$ | *impossibile* |
| 110 | $\frac{3^{-2x-1}+\sqrt{9^{1-2x}}}{2^{x+3}+2^{x-3}}>2$ | $x<-\frac{ln\,39-ln\,8}{ln\,18}$ |

equazioni esponenziali di riepilogo

| | | |
|---|---|---|
| 111 | $\frac{5^{x}+1}{5^{2x}-2}<1$ | $x<\frac{ln\,2}{2\,ln\,5}\cup x>\frac{ln(\sqrt{13}+1)}{ln\,5}-\frac{ln\,2}{ln\,5}$ |
| 112 | $\left(\frac{1}{7}\right)^{\sqrt{x^{2}-x}}\geq\left(\frac{1}{7}\right)^{\sqrt{2}}$ | $-1\leq x\leq 0\cup 1\leq x\leq 2$ |
| 113 | $\left(\frac{1}{10}\right)^{\frac{2}{x-1}}>3^{2(x+1)}$ | $x<1$ |
| 114 | $3^{\frac{2}{x}}-3^{\frac{1}{x}}+1>0$ | $\forall x\in\mathcal{R}-\{0\}$ |
| 115 | $3^{x+1}+2^{x+1}\leq 3^{x}+5\cdot 2^{x}$ | $x\leq 1$ |
| 116 | $5^{\left\lvert\frac{2x+1}{3-x}\right\rvert}<5$ | $-4<x<\frac{2}{3}$ |
| 117 | $3^{x}-2\left(\frac{1}{3}\right)^{x}\geq-1$ | $x\geq 0$ |
| 118 | $a^{\sqrt{4-x}}>a^{3x-2}$ | $x<\frac{11}{9}$ |
| 119 | $3^{\sqrt{x^{2}-9}}\geq 0$ | $x\leq-3\cup x\geq 3$ |

# Disequazioni esponenziali

| | | |
|---|---|---|
| 120 | $3^{sen\,3x} > \sqrt{3}$ | $\frac{\pi}{18} + \frac{2}{3}k\pi < x < \frac{5}{18}\pi + \frac{2}{3}k\pi$ |
| 121 | $3 \cdot 5^x - 13 \cdot 3^{2x} < 0$ | $x > \frac{ln\,13 - ln\,3}{ln\,5 - ln\,9}$ |
| 122 | $x^{\sqrt{x+1}} > 0$ | $x > 0$ |
| 123 | $2^{4(x+1)} - 25 \cdot 2^{2x} + 9 \geq 0$ | $x \leq log_2 3 - 2 \cup x \geq 0$ |
| 124 | $\sqrt[4]{3^{3x-2}} > \sqrt[3]{3^{x-2}}$ | $x > -\frac{2}{5}$ |
| 125 | $49^x + \frac{1}{7^{2x}} \leq 2$ | *impossibile* |
| 126 | $\sqrt{2}^{3x+1} + 3^{2x+1} \geq 3^{2x} + \sqrt{2}^{3x+2}$ | $x \geq \frac{ln\,2 - ln(2-\sqrt{2})}{\frac{3}{2}ln\,2 - 2\,ln\,3}$ |
| 127 | $\left(\frac{1}{3}\right)^{(x-2)^2} < \left(\frac{1}{3}\right)^{4(x-3)}$ | $\forall x \in \mathcal{R} - \{4\}$ |
| 128 | $\left(\frac{1}{2}\right)^{tgx} < \left(\frac{1}{2}\right)^{\sqrt{3}}$ | $\frac{\pi}{3} + k\pi < x < \frac{\pi}{2} + k\pi$ |
| 129 | $2^{2cosx+1} - 3 \cdot 2^{cosx} + 1 \leq 0$ | $\frac{\pi}{2} + 2k\pi \leq x \leq \frac{3}{2}\pi + 2k\pi$ |
| 130 | $7^{\frac{1}{25^x} - \frac{2}{5^x - 25^x}} > 7^{\frac{1}{(5^x-1)^2}}$ | $x < \frac{ln(1+\sqrt{2}/2)}{ln\,5} \cup x > \frac{ln(1+\sqrt{2}/2)}{ln\,5}$ |
| 131 | $3^{2x} - \sqrt{3} \cdot 2^x > 0$ | $x > \frac{ln\,3}{ln\,81 - ln\,4}$ |
| 132 | $\frac{2^x \cdot 5 - 5^x}{\sqrt{2^{x-1}}} < 0$ | $x > \frac{ln\,5}{ln\,5 - ln\,2}$ |
| 133 | $3^{-2x+1} - 4\left(\frac{1}{3}\right)^x + 1 \leq 0$ | $0 \leq x \leq 1$ |
| 134 | $3^{2-x} > \sqrt{\left(\frac{1}{3}\right)^{x-4} \cdot 9^{-x}}$ | $x > 0$ |
| 135 | $\left(\frac{1}{2}\right)^{x^2-2} \cdot 4 < 8^{3-x}$ | $\forall x \in \mathbb{R}$ |
| 136 | $\frac{2 \cdot 5^{3+2x}}{9^x} > \sqrt{2}$ | $x > -\frac{1}{4}\frac{6\,ln\,5 + ln\,2}{ln\,5 - ln\,3}$ |
| 137 | $\frac{\sqrt[2x-12]{4^{3x}}}{\sqrt{2^{x-1}}} > \frac{4}{\sqrt[x-6]{8^{x+6}}}$ | $x < 3 \;\cup\; 6 < x < 18$ |
| 138 | $\left(\frac{e}{2}\right)^{2x-1} - 2\left(\frac{e}{2}\right)^{\frac{2x-1}{2}} + 1 > 0$ | $\forall x \in \mathbb{R} - \left\{\frac{1}{2}\right\}$ |