

ESERCIZI IN PIÙ

ESERCIZI DI FINE CAPITOLO

Risolvi le seguenti equazioni di grado superiore al secondo.

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|----------|---|---|-----------|--|---|
| 1 | $3x^4 + 2x^2 - 1 = 0$ | $\left[+\frac{\sqrt{3}}{3} \right]$ | 10 | $\frac{x^2 - 9}{x - 2} = \frac{x - 3}{2x} - \frac{25x}{2x^2 - 4x}$ | $\left[\frac{1}{2} \right]$ |
| 2 | $\sqrt{2}x^4 - 10x^2 + 12\sqrt{2} = 0$ | $[\pm \sqrt[4]{8}; \pm \sqrt[4]{18}]$ | 11 | $\frac{x^2 + 6}{x^2 + 4} = \frac{41}{13} - \frac{x^2 + 1}{x^2 - 4}$ | $[\pm 3]$ |
| 3 | $9a^4x^6 - 16b^4 = 0$ | $\left[\pm \sqrt[3]{\frac{4b^2}{3a^2}} \right]$ | 12 | $2x^2 + \frac{3x^2}{x - 3} = \frac{2 - 3x}{x^2 - 3x}$ | $[\pm 1]$ |
| 4 | $x^6 - 26x^3 - 27 = 0$ | $[-1; 3]$ | 13 | $\frac{(2x - 1)^4 \cdot (x - 6)^3}{4x^2 - 1} = 0$ | $[6]$ |
| 5 | $5x^3 + 21x^2 - 21x - 5 = 0$ | $\left[-5; -\frac{1}{5}; 1 \right]$ | 14 | $\frac{(x - 3)^4 - 16}{x - 1} = 0$ | $[5]$ |
| 6 | $(2x - 1)^4 = 16$ | $\left[-\frac{1}{2}; \frac{3}{2} \right]$ | 15 | $\left(\frac{x + 3}{x + 1}\right)^4 - 13\left(\frac{x + 3}{x + 1}\right)^2 + 36 = 0$ | $\left[-\frac{3}{2}; -\frac{5}{3}; 0; 1 \right]$ |
| 7 | $(4x^2 - 1)^5 = 243$ | $[\pm 1]$ | 16 | $(x^2 - 1)^6 - 26(x^2 - 1)^3 - 27 = 0$ | $[0; \pm 2]$ |
| 8 | $100x^2 + \frac{1}{x^2} = 29$ | $\left[\pm \frac{1}{5}; \pm \frac{1}{2} \right]$ | 17 | $\left(\frac{2x - 1}{x}\right)^{10} + 31\left(\frac{2x - 1}{x}\right)^5 - 32 = 0$ | $\left[\frac{1}{4}; 1 \right]$ |
| 9 | $(1 - x^2)(2x + 3)^2 = 5(x - 1)^2(x + 1)$ | $\left[\pm 1; -4; -\frac{1}{4} \right]$ | | | |

Risolvi le seguenti equazioni irrazionali.

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|-----------|---|--|-----------|---|--|
| 18 | $\sqrt[3]{4x + 7} = 3$ | $[5]$ | 24 | $\sqrt{19 - 2x} = x + 8$ | $[-3]$ |
| 19 | $\sqrt[3]{x^3 + 10x + 7} - 1 = x$ | $\left[3; -\frac{2}{3} \right]$ | 25 | $\sqrt{x + 7} - x = 1$ | $[2]$ |
| 20 | $\sqrt[3]{(x + 2)(x - 3)} - \sqrt[3]{(x - 2)(x + 2)} = 0$ | $[-2]$ | 26 | $\sqrt{5 + 4x - x^2} - x + 1 = 0$ | $\left[\frac{3 + \sqrt{17}}{2} \right]$ |
| 21 | $3x - 2\sqrt{2x - 7} = 2x + 2$ | $[4; 8]$ | 27 | $\sqrt{7 - x} - \sqrt{2x + 9} = 0$ | $\left[-\frac{2}{3} \right]$ |
| 22 | $\frac{\sqrt{3}}{\sqrt{5x + 1}} = \sqrt{5x - 1}$ | $\left[\frac{2}{5} \right]$ | 28 | $\sqrt[4]{(x - 3)(x + 7)} = \sqrt[4]{x^2 + 3x - 5}$ | $[16]$ |
| 23 | $\sqrt{3x + a^2} = \sqrt{3x - 4a^2} + a$ | $\left[\text{se } a = 0, x \geq 0; \text{ se } a > 0, x = \frac{8}{3}a^2 \right]$ | 29 | $\sqrt[3]{x^3 - 5x^2 + 16x - 29} + 2 = x$ | $[-7; 3]$ |

Risolvi i seguenti sistemi.

- 30** $\begin{cases} (x+y)^2 - xy = y + 3x \\ x - y = 3 \end{cases}$ $\left[(3; 0), \left(\frac{4}{3}; -\frac{5}{3} \right) \right]$
- 31** $\begin{cases} \frac{y^2}{x} - \frac{y}{x} = \frac{7}{x} - 1 \\ x + y = 4 \end{cases}$ $[(5; -1), (1; 3)]$
- 32** $\begin{cases} xy = 15 \\ x + y = -8 \end{cases}$ $[(-3; -5), (-5; -3)]$
- 33** $\begin{cases} 4(x-1)^2 - 3(y+2)^2 = -3 \\ x - y = 4 \end{cases}$ $[(1; -3); (-5; -9)]$
- 34** $\begin{cases} x - 2y = 1 \\ x^2 - 4y^2 - 2x + 1 = 0 \end{cases}$ [indeterminato]
- 35** $\begin{cases} \frac{x}{y} + \frac{y}{x} = 2 \\ x + y = 10 \end{cases}$ $[(5; 5)]$
- 36** $\begin{cases} \frac{x-3}{2-3x} = y \\ 3x = 2y + 3 \end{cases}$ $\left[\left(\frac{13}{9}; \frac{2}{3} \right), \left(0; -\frac{3}{2} \right) \right]$
- 37** $\begin{cases} xy = x + y + 19 \\ x + y + 7 = 0 \end{cases}$ $[(-4; -3), (-3; -4)]$
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- 38** $\begin{cases} 4(x^2 + y^2) = 51 \\ 2x + 2y = -3\sqrt{3} \end{cases}$ $\left[\left(\frac{1}{2}\sqrt{3}; -2\sqrt{3} \right), \left(-2\sqrt{3}; \frac{1}{2}\sqrt{3} \right) \right]$
- 39** $\begin{cases} xy = 24 \\ x + y = 10 \end{cases}$ $[(6; 4), (4; 6)]$
- 40** $\begin{cases} 2x^2 + 2y^2 = 5 \\ 2x + 2y = 3\sqrt{2} \end{cases}$ $\left[\left(\frac{1}{\sqrt{2}}; \sqrt{2} \right), \left(\sqrt{2}; \frac{1}{\sqrt{2}} \right) \right]$
- 41** $\begin{cases} 32(x^2 + y^2) = 29 \\ 4x + 4y = 5 \end{cases}$ $\left[\left(\frac{7}{8}; \frac{3}{8} \right), \left(\frac{3}{8}; \frac{7}{8} \right) \right]$
- 42** $\begin{cases} x^2 + y^2 = 35 \\ x + 2\sqrt{2} = 3\sqrt{3} - y \end{cases}$ $[(-2\sqrt{2}; 3\sqrt{3}), (3\sqrt{3}; -2\sqrt{2})]$
- 43** $\begin{cases} x^2 + y^2 - 3xy = 7 + 3\sqrt{10} \\ x + y = \sqrt{2} - \sqrt{5} \end{cases}$ $[(\sqrt{2}; -\sqrt{5}), (-\sqrt{5}; \sqrt{2})]$
- 44** $\begin{cases} ax + x + ay + y = 2a^2 + 2a \\ a^2 = xy + 1 \end{cases}$ $(a \neq -1)$ $[(a-1; a+1), (a+1; a-1)]$
- 45** $\begin{cases} ax + a^2 = 1 - ay \\ xy = -1 \end{cases}$ $(a \neq 0)$ $\left[\left(-a; \frac{1}{a} \right), \left(\frac{1}{a}; -a \right) \right]$
- 46** $\begin{cases} 2x - a = -2y + 3 \\ 2xy + a^2 = 1 \end{cases}$ $\left[\left(a+1; \frac{1-a}{2} \right), \left(\frac{1-a}{2}; a+1 \right) \right]$
- 47** $\begin{cases} xy = -(b+2) \\ x + y = b+1 \end{cases}$ $[(-1; b+2), (b+2; -1)]$
- 48** $\begin{cases} xy = \frac{a}{b} \\ 2bx + by - b = bx + a \end{cases}$ $\left[\left(1; \frac{a}{b} \right), \left(\frac{a}{b}; 1 \right) \right]$
- 49** $\begin{cases} x - y + z = -2 \\ x + z = 0 \\ x^2 - 4y + z^2 = -6 \end{cases}$ $[(1; 2; -1), (-1; 2; 1)]$
- 50** $\begin{cases} x + 5a = -y \\ 2xy = -48a^2 \end{cases}$ $[(3a; -8a), (-8a; 3a)]$