

COMPITI PER LE VACANZE
Disciplina: MATEMATICA
CLASSE 2[^]D

ISTRUZIONI GENERALI

1. gli esercizi vanno svolti **in ordine e su fogli** (non su quaderno) **numerati**;
2. riportare nome e cognome (su ogni foglio)
3. scrivere il numero dell'esercizio (per ogni esercizio);
4. gli **studenti con giudizio sospeso** devono svolgere tutti gli esercizi;
5. gli **studenti promossi a giugno** devono svolgere solo gli esercizi con numero con numero pari; non è, ovviamente vietato svolgere tutti gli esercizi, in particolare consiglio vivamente di farlo ai seguenti studenti:
 - Boscolo Nata Nicola
 - Chiereghin Daniel
 - Nordio Cristian
 - Tarozzo Daniele.

Risolvere, con il metodo che si ritiene più opportuno, i seguenti sistemi lineari:

$$32. \begin{cases} 14x - 2y = 6 \\ 5x + y = 1; \end{cases} \quad \begin{cases} 9x - 6y = 6 \\ 6x - 4y = 4. \end{cases} \quad \left[\left(\frac{1}{3}, -\frac{2}{3} \right); \text{indeterminato} \right]$$

$$33. \begin{cases} 6x - 3y = 45 \\ 4x - 2y = 30; \end{cases} \quad \begin{cases} 21x - 6y = 11 \\ 14x - 4y = 3. \end{cases} \quad [\text{Indeterminato}; \text{impossibile}]$$

$$34. \begin{cases} \frac{x}{2} - \frac{y}{3} = \frac{4-5x}{6} \\ 2y - x = 3; \end{cases} \quad \begin{cases} \frac{2x-1}{3} + y = 1 \\ 5x + 9 + 2y = 30. \end{cases} \quad [(1, 2); (5, -2)]$$

$$35. \begin{cases} \frac{x-1}{3} + \frac{y+2}{4} = \frac{5}{12} \\ 6x - 6y = 1; \end{cases} \quad \begin{cases} \frac{x}{4} + \frac{y-1}{6} = 0 \\ \frac{x+y}{4} = \frac{5}{24}. \end{cases} \quad \left[\left(\frac{1}{2}, \frac{1}{3} \right); \left(\frac{1}{3}, \frac{1}{2} \right) \right]$$

$$36. \begin{cases} \frac{x+y}{4} = \frac{x-y}{6} + \frac{3}{4} \\ \frac{x}{4} + y = 2; \end{cases} \quad \begin{cases} 3y - \frac{2x}{5} = 4 \\ \frac{4}{3}x - \frac{2y}{5} = \frac{88}{15}. \end{cases} \quad [(4, 1); (5, 2)]$$

$$37. \begin{cases} \frac{3(x-6)}{4} + \frac{4(y-7)}{5} = \frac{x+4}{10} - \frac{y-3}{4} \\ \frac{2x}{3} - \frac{y+1}{2} = \frac{3(x-1)}{5} - \frac{5y+1}{12}. \end{cases} \quad [(6, 7)]$$

$$38. \begin{cases} \frac{x-1}{2} + \frac{y-1}{3} = \frac{5x+3y}{8} - \frac{x-5y}{4} - 2 \\ \frac{2x+y}{3} - \frac{x+y}{4} = \frac{1}{2} - \frac{4x-1}{3} + \frac{5y+1}{6}. \end{cases} \quad [(1, 1)]$$

$$39. \begin{cases} \frac{3x+y}{6} - x - 1 = -\frac{y}{4} + \frac{x-3y}{12} \\ \frac{2(x-1)^2}{6} + y + \frac{y+2x}{10} = \frac{2+x^2}{3} + \frac{17}{30}y. \end{cases} \quad [\text{Impossibile}]$$

$$56. \begin{cases} (x+y)^2 + 10x - y = (x+1)(y-3) + xy + x^2 + y^2 \\ 4x - y + \frac{8x+2y}{5} = 8 + \frac{2x+y}{5}. \end{cases} \quad [\text{Impossibile}]$$

$$57. \begin{cases} (y-3)^2 + (x-2)^2 + 8x + 15 = (y-5)^2 + (x+3)(x-1) \\ \frac{2x+y}{5} - \frac{x}{3} - \frac{2y}{3} - 1 = 0. \end{cases} \quad [(1, -2)]$$

$$61. \begin{cases} \frac{7y+13-5x}{4} + y = 2x - \frac{3y+2(x-8)}{3} \\ \frac{2x+5y}{6} - \frac{3x-4(3-2y)}{5} + x = 4 - \frac{15+2y-4x}{3}. \end{cases} \quad [(5, 4)]$$

$$62. \begin{cases} \frac{x-2}{3} - \frac{y}{4} - \frac{2}{3} \left(\frac{y}{2} - \frac{x+1}{4} \right) = -1 \\ \frac{1}{2} \left(\frac{x-1}{2} - \frac{2y-3}{3} \right) - \frac{x+1}{2} + \frac{3}{4}y = 0. \end{cases} \quad [(-1, 0)]$$

Eeguire le seguenti operazioni e semplificare il più possibile i risultati:

$$367. (\sqrt{8} - \sqrt{75})(\sqrt{12} - \sqrt{50}); \quad (\sqrt{20} - \sqrt{8})(\sqrt{45} + \sqrt{32}). \quad [29\sqrt{6} - 50; 2(\sqrt{10} + 7)]$$

$$368. \sqrt{2}(\sqrt{6} - \sqrt{2}) - \sqrt{3}(2 - \sqrt{3}); \quad (2\sqrt{3} + 4\sqrt{6} - 6\sqrt{2})(\sqrt{2} + \sqrt{3}). \quad [1; 2(4\sqrt{3} + 6\sqrt{2} - 2\sqrt{6} - 3)]$$

$$369. (2\sqrt{5} + \sqrt{6} - 4\sqrt{3})(\sqrt{5} - \sqrt{3}) + 3(2\sqrt{15} + \sqrt{2}). \quad [\sqrt{30} + 22]$$

$$370. 3\sqrt{6}(\sqrt{6} - \sqrt{3} + 2\sqrt{2}) - 6\sqrt{2}(\sqrt{6} + \sqrt{2}) + 9\sqrt{2}. \quad [6]$$

$$371. 2\sqrt{5}(\sqrt{10} + \sqrt{15} + \sqrt{3}) - \sqrt{3}(10 + 3\sqrt{6} + \sqrt{20}). \quad [\sqrt{2}]$$

$$372. (\sqrt[4]{2} - \sqrt{2})^2 + \sqrt[4]{8}(\sqrt[4]{8} - \sqrt[4]{2}) - \sqrt{2}(3 - 2\sqrt[4]{2}). \quad [0]$$

$$373. (2\sqrt{3} - \sqrt{2})^3 - 6\sqrt{2}(2\sqrt{2} + \sqrt{6}) + (3\sqrt{2})^3 - 24(\sqrt{3} - 1). \quad [16\sqrt{2}]$$

$$374. (\sqrt{12} + \sqrt{6} - \sqrt{18})(2\sqrt{3} + \sqrt{6} + 3\sqrt{2}) - \sqrt{3}(\sqrt{8} + 1)(4\sqrt{3} - \sqrt{6}). \quad [-9\sqrt{2}]$$

$$375. \left(\frac{\sqrt{18}}{4} + \sqrt{3}\right)^2 + \sqrt{6}\left(1 - \frac{3}{2}\sqrt{2}\right) + 3\sqrt{3} - \frac{33}{8}. \quad \left[\frac{5}{2}\sqrt{6}\right]$$

$$586. \left(\frac{\sqrt{3}}{\sqrt{6} - 2} - \frac{1}{\sqrt{2} + \sqrt{5}} + \frac{\sqrt{5}}{\sqrt{10} + 5}\right)(3\sqrt{2} - 2\sqrt{3}) \cdot \frac{\sqrt{3} - \sqrt{2}}{3(\sqrt{3} + \sqrt{2})}. \quad [5 - 2\sqrt{6}]$$

$$587. \left[\frac{(1 + \sqrt{2})^2}{\sqrt{2}(2 + \sqrt{2})} + (1 + \sqrt{2})\left(\frac{1}{2\sqrt{2}} + \frac{1}{4 + 2\sqrt{2}}\right)\right](\sqrt{2} - 1). \quad [1]$$

$$588. \frac{(\sqrt{3} - 1)^2}{4\sqrt{3}} + (\sqrt{3} - 1)\left(1 - \frac{1}{\sqrt{3}}\right)\frac{1}{4} - \frac{2}{\sqrt{3}}. \quad [-1]$$

$$589. \frac{2}{3 + 2\sqrt{6}} - \frac{\sqrt{2}}{2\sqrt{3}} + \frac{\sqrt{2}}{2(2\sqrt{2} + \sqrt{3})} + \frac{1}{\sqrt{3}} - \frac{\sqrt{3} + 1}{4\sqrt{3}} + \frac{\sqrt{3} + 1}{4}. \quad \left[\frac{\sqrt{3}}{2}\right]$$

$$590. \left[\left(\frac{\sqrt{2}}{\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{2}}\right) : \left(\frac{\sqrt{2}}{\sqrt{3}} - \frac{\sqrt{3}}{\sqrt{2}}\right)\right] \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}} \cdot \frac{1}{5 + 2\sqrt{6}}. \quad [-5]$$

$$591. \left(1 - \frac{2\sqrt{2}}{3\sqrt{3}}\right)\left(\sqrt{3} - \frac{\sqrt{6}(\sqrt{2} + \sqrt{3})}{5 + \sqrt{6}}\right)\left(1 - \frac{\sqrt{3}}{\sqrt{2} - \sqrt{3}}\right)\left(\sqrt{3} + \frac{1}{\sqrt{2}}\right). \quad [5]$$

$$592. \left(\frac{\sqrt{3} + 1}{\sqrt{3} - 1} + \frac{\sqrt{3} - 1}{\sqrt{3} + 1} - 2\right)\left(1 - \frac{2}{\sqrt{3} + 1}\right) \cdot \frac{2 - \sqrt{3}}{4 + 2\sqrt{3}}. \quad [(2 - \sqrt{3})^3]$$

$$593. \left(\frac{1}{\sqrt{6} + 1} - \frac{2\sqrt{6}}{6 - \sqrt{6}} + \frac{\sqrt{6} + 2}{5}\right) \cdot \frac{15}{\sqrt{6}}. \quad \left[-\frac{\sqrt{6}}{2}\right]$$

Risolvere le seguenti equazioni a coefficienti irrazionali:

- 655.** $\sqrt{5}(x-1) = -\sqrt{3};$ $(\sqrt{7}-\sqrt{5})x - \sqrt{7} + \sqrt{5} = 0.$ $\left[\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}}; 1 \right]$
- 656.** $x\sqrt{2} + 2\sqrt{3} = x\sqrt{3};$ $x\sqrt{2} + 4 = 3x\sqrt{2} - 4x.$ $[2(3+\sqrt{6}); -2-\sqrt{2}]$
- 657.** $x\sqrt{3} - 1 = x + \sqrt{3};$ $x\sqrt{5} = 5 + \sqrt{5}.$ $[2+\sqrt{3}; \sqrt{5}+1]$
- 658.** $x\sqrt{2} = x + 2\sqrt{2};$ $\sqrt{7}(x-\sqrt{7}+3) = x+2.$ $[4+2\sqrt{2}; \sqrt{7}-2]$
- 659.** $\sqrt{5}(x-\sqrt{5}) - \sqrt{2}(\sqrt{2}-x) = 2\sqrt{10}.$ $[\sqrt{2}+\sqrt{5}]$
- 670.** $\frac{x-1}{2\sqrt{2}-2} + \frac{x}{\sqrt{2}+1} = 1;$ $\frac{x}{\sqrt{2}+3} - \frac{x}{3-\sqrt{2}} + \frac{8}{7} = 0.$ $\left[\frac{10\sqrt{2}+9}{17}; 2\sqrt{2} \right]$
- 671.** $\frac{x+\sqrt{3}}{\sqrt{3}+1} - \frac{x-2\sqrt{3}}{\sqrt{3}-1} + 2\sqrt{3} = 0;$ $\frac{1-x}{2} - \frac{x}{\sqrt{2}-2} = \frac{\sqrt{2}x}{\sqrt{2}-1}.$ $\left[\frac{5\sqrt{3}+9}{2}; \frac{3-\sqrt{2}}{7} \right]$
- 672.** $\frac{x}{3+\sqrt{3}} + 2 - \frac{x}{3-\sqrt{3}} = 0;$ $\frac{x-1}{\sqrt{2}-1} - \frac{x+1}{\sqrt{2}+1} + x = \frac{\sqrt{2}+2}{1+\sqrt{2}}.$ $[2\sqrt{3}; \sqrt{2}]$

Risolvere i seguenti sistemi a coefficienti irrazionali:

- 696.** $\begin{cases} x + \sqrt{2}y = 3\sqrt{2} \\ 2x - 3\sqrt{2}y = \sqrt{2}; \end{cases}$ $\begin{cases} x + 5y = 2\sqrt{5} \\ \sqrt{5}(x-y) = 4. \end{cases}$ $\left[(2\sqrt{2}, 1); \left(\sqrt{5}, \frac{\sqrt{5}}{5} \right) \right]$
- 697.** $\begin{cases} x+y = (\sqrt{2}+1)^2 \\ x-\sqrt{2}y = -1; \end{cases}$ $\begin{cases} x+y = \sqrt{5}+1 \\ 3x+y = 3(\sqrt{5}-1). \end{cases}$ $[(3, 2\sqrt{2}); (\sqrt{5}-2, 3)]$
- 698.** $\begin{cases} \sqrt{3}x - y = 3 - \sqrt{2} \\ \sqrt{2}x - y = \sqrt{6} - \sqrt{2}; \end{cases}$ $\begin{cases} x+y = 2 \\ x-y = 2(\sqrt{3}-1). \end{cases}$ $[(\sqrt{3}, \sqrt{2}); (\sqrt{3}, 2-\sqrt{3})]$
- 699.** $\begin{cases} \sqrt{3}x - \sqrt{2}y = 2 \\ \sqrt{2}x - \sqrt{3}y = \sqrt{6}-1; \end{cases}$ $\begin{cases} (\sqrt{3}-1)x + (\sqrt{3}+1)y = 4 \\ \sqrt{2}x + \sqrt{6}y = 4\sqrt{2}. \end{cases}$ $[(\sqrt{2}, \sqrt{3}-\sqrt{2}); (\sqrt{3}+1, \sqrt{3}-1)]$
- 700.** $\begin{cases} \sqrt{2}x + \sqrt{3}y = 2 \\ 2x - 3y = \sqrt{2} - \sqrt{3}; \end{cases}$ $\begin{cases} x - \sqrt{5}y = \sqrt{5}(\sqrt{5}-1) \\ \sqrt{5}x - y = 5\sqrt{5}-1. \end{cases}$ $\left[\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{3}}{3} \right); (5, 1) \right]$
- 701.** $\begin{cases} x + 2\sqrt{2}y = 4 \\ \sqrt{2}(x+y) = 2\sqrt{2}+1; \end{cases}$ $\begin{cases} (\sqrt{3}-1)x + (\sqrt{3}+1)y = 3 \\ 2x+y = 2\sqrt{3}. \end{cases}$ $\left[\left(2, \frac{\sqrt{2}}{2} \right); \left(\frac{\sqrt{3}+1}{2}, \sqrt{3}-1 \right) \right]$

Risolvere le seguenti equazioni di II grado frazionarie (ricordarsi di controllare l'accettabilità delle soluzioni)

$$97. \quad \frac{2}{x-1} + \frac{x+5}{x^2-1} = 2; \quad \frac{2}{x} + \frac{5x+2}{3x^2} - 2 = 0. \quad \left[-\frac{3}{2}, 3; -\frac{1}{6}, 2\right]$$

$$98. \quad \frac{5}{x^2-4} + \frac{x+3}{x-2} = 7; \quad \frac{x+1}{x-1} + \frac{x+2}{x-2} = \frac{2x+13}{x+1}. \quad \left[-\frac{13}{6}, 3; \frac{6}{5}, 5\right]$$

$$99. \quad \frac{x}{x-6} - \frac{1}{2} = \frac{x}{6} + \frac{x+6}{6-x}; \quad \frac{x-1}{x-3} - 4 = \frac{x+1}{2-x}. \quad \left[-3, 18; \frac{5}{2}, 5\right]$$

$$100. \quad \frac{9-x}{x-5} + \frac{x+1}{x-3} = 3; \quad \frac{x+2}{1-x} + \frac{2}{x} = \frac{19}{2}. \quad \left[\frac{11}{3}, 7; \frac{1}{3}, \frac{4}{7}\right]$$

$$101. \quad \frac{x-1}{x-3} + \frac{14}{x^2-9} = 5; \quad \frac{1}{x^2} + \frac{1}{x(x-1)} = \frac{1}{(x-1)^2}. \quad \left[-\frac{7}{2}, 4; \frac{3 \pm \sqrt{5}}{2}\right]$$

$$102. \quad \frac{1}{2(x+1)} - \frac{x}{2(x-1)} = \frac{x+2}{x^2-1}; \quad \frac{2-x}{2(x+1)} = \frac{1}{x-1} - \frac{x^2+1}{x^2-1}. \quad [\text{Impossibile}; -2]$$

$$103. \quad \frac{1-x}{3-x} = \frac{1}{x+3} - \frac{x^2-1}{x^2-9}; \quad \frac{15}{x} = \frac{72-6x}{2x^2} + 2. \quad \left[\frac{1}{2}, -1; 6, 3\right]$$

$$104. \quad \frac{2x+1}{7-x} + \frac{4x+1}{7+x} = \frac{45}{49-x^2} + 1; \quad \frac{x-5}{x+3} + \frac{33}{x^2-9} = \frac{8-x}{x-3} + \frac{1}{2}. \quad [2, 40; \text{impossibile}]$$

$$105. \quad \frac{2x+1}{x+1} - \frac{x-1}{x+2} = \frac{x-1}{x-2}; \quad \frac{2x+13}{x+1} - \frac{x+2}{x-2} = \frac{x+1}{x-1}. \quad \left[3 \pm \sqrt{13}; 5, \frac{6}{5}\right]$$

$$106. \quad \frac{x+6}{6-x} + \frac{1}{2} = \frac{x}{x-6} - \frac{x}{6}; \quad \frac{3x+11}{x+1} - \frac{2x-3}{x-2} = \frac{x+1}{x-1}. \quad \left[18, -3; 3, \frac{7}{5}\right]$$

$$110. \quad \left(x - \frac{1}{x-1}\right)^2 + \frac{2}{(x-1)^2} = \left(x - \frac{1}{x+1}\right)\left(x - \frac{1}{x-1}\right). \quad [1 - \sqrt{3}; 1 + \sqrt{3}]$$

$$111. \quad \frac{1}{1+x} + \frac{1}{1-x} + \frac{1}{(x+1)^2} + \frac{1}{(x-1)^2} = \frac{1}{x^2-1}. \quad [\pm\sqrt{5}]$$

$$113. \quad \frac{x-4}{x^2-5x+6} + \frac{1}{(2-x)(3-x)(4-x)} = \frac{x-2}{x^2-7x+12} + \frac{x-3}{x^2-6x+8}. \quad [1 \pm \sqrt{3}]$$

$$114. \quad \frac{x}{2(x^2-3x+2)} + \frac{2x-3}{(x-2)(x-3)(x-1)} = \frac{x}{x^2-4x+3}. \quad [\text{Impossibile}]$$

Risolvere, mediante scomposizione, le seguenti equazioni di grado superiore al II:

- 32.** $2x^3 - x^2 - 2x + 1 = 0;$ $x^3 + x^2 - 4x - 4 = 0.$ $\left[-1, 1, \frac{1}{2}; -2, -1, 2\right]$
- 33.** $t^4 + t^3 - 16t^2 - 16t = 0;$ $z^4 - 6z^3 + 13z^2 - 12z + 4 = 0.$ $[0, -4, -1, 4; 1, 2]$
- 34.** $x^4 - 10x^2 + 9 = 0;$ $y^4 - 4y^3 + y^2 + 8y - 6 = 0.$ $[\pm 1, \pm 3; \pm\sqrt{2}, 1, 3]$
- 35.** $12t^4 - 8t^3 - 3t^2 + 2t = 0;$ $x^4 - 4x^3 - x^2 + 16x - 12 = 0.$ $\left[0, \pm\frac{1}{2}, \frac{2}{3}; 1, \pm 2, 3\right]$
- 36.** $x^4 - 4x^3 + 4x^2 = 1;$ $x^5 - 5x^3 - 8x^2 + 40 = 0.$ $[1, 1 - \sqrt{2}, 1 + \sqrt{2}; 2, \pm\sqrt{5}]$

Risolvere in $\mathbb{R}$ le seguenti equazioni biquadratiche a coefficienti numerici.

- 64.** $x^4 - 4x^2 - 5 = 0;$ $x^4 + 13x^2 + 36 = 0;$ $x^4 - 29x^2 + 100 = 0.$ $[\pm\sqrt{5}; \text{imp.}; \pm 2, \pm 5]$
- 65.** $x^4 - 10x^2 - 96 = 0;$ $x^4 + 28x^2 - 288 = 0;$ $x^4 - 13x^2 - 48 = 0.$ $[\pm 4; \pm 2\sqrt{2}; \pm 4]$
- 66.** $x^4 - 72x^2 - 5929 = 0;$ $x^4 + 6x^2 - 27 = 0;$ $y^4 - 324y^2 + 1280 = 0.$ $[\pm 11; \pm\sqrt{3}; \pm 2, \pm 8\sqrt{5}]$
- 67.** $3x^4 - 22x^2 = 45;$ $8x^4 = 3 - 2x^2;$ $4x^4 - 37x^2 + 9 = 0.$ $\left[\pm 3; \pm\sqrt{\frac{1}{2}}; \pm 3, \pm\frac{1}{2}\right]$
- 68.** $(x^2 - 12)(x^2 - 15) = 130;$ $(x - 2)(x^2 - 1)(x + 3) = x(x^2 - 1) - 6.$ $[\pm\sqrt{2}, \pm 5; \pm\sqrt{3}, \pm 2]$

Risolvere le seguenti equazioni trinomie a coefficienti numerici.

- 143.** $y^6 - 7y^3 + 10 = 0;$ $x^6 - 26x^3 - 27 = 0;$ $x^6 - 28x^3 + 27 = 0.$ $[\sqrt[3]{2}, \sqrt[3]{5}; -1, 3; 1, 3]$
- 144.** $x^6 - 35x^3 + 216 = 0;$ $x^6 - 9x^3 + 8 = 0;$ $x^6 + 28x^3 + 27 = 0.$ $[2, 3; 1, 2; -1, -3]$
- 145.** $x^2(x^2 + 1) + \frac{x}{x-1} = \frac{x(3x^2 + 1) - 2}{x^2 - 1};$ $\frac{x^6}{16} - 8x^3 = -2\left(72 + \frac{7}{8}x^3\right).$ $[\sqrt[3]{2}; \sqrt[3]{36}, 4]$
- 146.** $8x^6 - 35x^3 + 27 = 0;$ $x^6 + 26x^3 - 27 = 0;$ $512x^6 + 152x^3 - 27 = 0.$ $\left[1, \frac{3}{2}; 1, -3; -\frac{3}{4}, \frac{1}{2}\right]$

Risolvere i seguenti sistemi di II grado:

$$3. \quad \begin{cases} 5x + y = 3 \\ 3x^2 - 5y = 13; \end{cases} \quad \begin{cases} 3xy - 2y = -4 \\ 3x + y = 5; \end{cases} \quad \begin{cases} 3x + y = 14 \\ x^2 - 2y = 12. \end{cases}$$

$$\left[(1, -2), \left(-\frac{28}{3}, \frac{149}{3}\right); (2, -1), \left(\frac{1}{3}, 4\right); (4, 2), (-10, 44) \right]$$

$$4. \quad \begin{cases} x + 2y = 6 \\ x^2 + 3xy = 28; \end{cases} \quad \begin{cases} 2x - y = 7 \\ 2xy + y^2 = 39; \end{cases} \quad \begin{cases} x - 2y + 1 = 0 \\ x^2 - 2y^2 - x = 10. \end{cases}$$

$$\left[(14, -4), (4, 1); (5, 3), \left(\frac{1}{4}, -\frac{13}{2}\right); (7, 4), (-3, -1) \right]$$

$$5. \quad \begin{cases} x^2 + y^2 + xy = 52 \\ x + y = 8; \end{cases} \quad \begin{cases} x + 2y = 5 \\ 2x^2 + y^2 - 2xy = 2; \end{cases} \quad \begin{cases} x - y + 1 = 0 \\ x^2 + xy + y^2 = 7. \end{cases}$$

$$\left[(6, 2), (2, 6); (1, 2), \left(\frac{17}{13}, \frac{24}{13}\right); (1, 2), (-2, -1) \right]$$

$$6. \quad \begin{cases} x + y = 10 \\ x^2 + y^2 - y = 51; \end{cases} \quad \begin{cases} 3x + 2y = 7 \\ x^2 - xy + 2y^2 = 7; \end{cases} \quad \begin{cases} (x + 2)(y + 1) = 24 \\ x + y = 7. \end{cases}$$

$$\left[(3, 7), \left(\frac{13}{2}, \frac{7}{2}\right); (1, 2), \left(\frac{5}{2}, -\frac{1}{4}\right); (4, 3), (2, 5) \right]$$

$$24. \quad \begin{cases} x + 2y = 4 \\ \frac{3x + 2y + 1}{x + y} - \frac{y + 2}{2x - y} = 2; \end{cases} \quad \begin{cases} \frac{y + 3}{y + 1} = 3 - \frac{2x - 1}{x + 1} \\ 2x^2 - y^2 = 3x + 1. \end{cases}$$

$$\left[(2, 1), \left(-\frac{20}{11}, \frac{32}{11}\right); (2, 1), \left(-\frac{5}{14}, -\frac{4}{7}\right) \right]$$

$$25. \quad \begin{cases} \frac{x - 2y}{x + y} = \frac{1}{4} \\ x^2 + y^2 = 1 + 3xy; \end{cases} \quad \begin{cases} \frac{1}{2x} + \frac{1}{3y} = 2 \\ 2x + 3y = 2. \end{cases}$$

$$\left[(3, 1), (-3, -1); \text{soluzioni coincidenti: } \left(\frac{1}{2}, \frac{1}{3}\right) \right]$$

$$26. \quad \begin{cases} \frac{5}{x - y} + \frac{3}{x + y} = 6 \\ 3x + 2y = 8; \end{cases} \quad \begin{cases} \frac{1}{xy} + \frac{3}{x} - \frac{2}{y} = -4 \\ 9y + x = 6. \end{cases}$$

$$\left[(2, 1), \left(\frac{104}{15}, -\frac{32}{5}\right); \left(-\frac{9}{4}, \frac{11}{12}\right), \left(3, \frac{1}{3}\right) \right]$$

$$29. \quad \begin{cases} \frac{y}{1 - x} + \frac{1 - x}{y} = \frac{13}{6} \\ x + y = 2; \end{cases} \quad \begin{cases} \frac{2x}{y} + 5 + \frac{3(x + y)}{y - x} = 0 \\ x + y = 3; \end{cases} \quad \begin{cases} \frac{x - y}{x + y} + \frac{x + y}{x - y} = \frac{50}{7} \\ xy = 12. \end{cases}$$

$$[(4, -2), (-1, 3); (2, 1), (6, -3); (4, 3), (-4, -3)]$$

$$30. \quad \begin{cases} \frac{x - 2}{y - 3} = 1 \\ (x - 3)(y - 4) = 7 - x - y; \end{cases} \quad \begin{cases} \frac{3x - 2}{2y + 3} + \frac{x}{y} = 4 \\ x - y = 4; \end{cases} \quad \begin{cases} \frac{2}{x} + \frac{3}{y} = 2 \\ 5x - 2y = 4. \end{cases}$$

$$\left[(1, 2), (3, 4); (8, 4), (3, -1); (2, 3), \left(\frac{2}{5}, -1\right) \right]$$

Risolvere le seguenti equazioni irrazionali:

- | | | |
|--|---|--|
| 283. $\sqrt{x-1} - x = -1;$ | $\sqrt{2x} + 4 - x = 0.$ | $[1, 2; 8]$ |
| 284. $x - 9 + \sqrt{10x+6} = 0;$ | $1 - 2x + \sqrt{2x+11} = 0.$ | $\left[3; \frac{5}{2}\right]$ |
| 285. $\sqrt{3x+16} - x - 2 = 0;$ | $\sqrt{19-2x} - x = 8.$ | $[3; -3]$ |
| 286. $\sqrt{4-3x} - 12 - x = 0;$ | $\sqrt{2x+1} - x + 1 = 0.$ | $[-7; 4]$ |
| 287. $\sqrt{1-3x} - x - 3 = 0;$ | $\sqrt{2x+11} - 4 - x = 0.$ | $[-1; -1]$ |
| 288. $\sqrt{39-6x} = 2x - 7;$ | $\sqrt{6-2x} = x - 3.$ | $[5; 3]$ |
| 289. $2x - \sqrt{4x-2} = 1;$ | $1 - \sqrt{1+3x} + 6x = 0.$ | $\left[\frac{1}{2}, \frac{3}{2}; 0\right]$ |
| 290. $2(2\sqrt{x-7} + x) = 3x - 4;$ | $\sqrt{3x+1} + 6 - 2x = 0.$ | $[8, 16; 5]$ |
| 291. $x + \sqrt{25-x^2} = 1;$ | $x + \sqrt{25-x^2} = 7.$ | $[-3; 3, 4]$ |
| 292. $\sqrt{x^2+3x-5} - x + 1 = 0;$ | $\sqrt{x^2+3x-5} - 1 + x = 0.$ | $\left[\frac{6}{5}; \text{impossibile}\right]$ |
| 293. $2\sqrt{x^2-4x-33} - x = 15;$ | $\sqrt{x^2-3x+2} + 3 - x = 0.$ | $\left[21, -\frac{17}{3}; \text{impossibile}\right]$ |
| 302. $\sqrt[3]{x^3-1} - x + 1 = 0;$ | $\sqrt[3]{27x^3+2} - 3x = 0.$ | $[0, 1; \text{impossibile}]$ |
| 303. $\sqrt[3]{x^3+26x} = x + 2;$ | $\sqrt[3]{x^3+7x} = x + 1.$ | $\left[1, \frac{4}{3}; \frac{1}{3}, 1\right]$ |
| 304. $\sqrt[3]{x^3-7x+2} = x - 1;$ | $\sqrt[3]{x^3-9x+1} = x - 2.$ | $\left[\frac{1}{3}, 3; \frac{1}{2}, 3\right]$ |
| 305. $\sqrt[3]{x^3+10x+7} - x - 1 = 0;$ | $x - 1 - \sqrt[3]{x+x^3-2} = 0.$ | $\left[-\frac{2}{3}, 3; -\frac{1}{3}, 1\right]$ |
| 315. $\sqrt{x-2} - \sqrt{2x-5} = 0;$ | $\sqrt{4x} = \sqrt{x-2}.$ | $[3; \text{impossibile}]$ |
| 316. $\sqrt{2x+1} - \sqrt{4x-1} = 0;$ | $\sqrt{2x-6} + \sqrt{4x^2-12x} = 0.$ | $[1; 3]$ |
| 317. $\sqrt{2x-6} + \sqrt{x^2-4} = 0;$ | $\sqrt{x^2+2x-8} - \sqrt{6x+4} = 0.$ | $[\text{Impossibile}; 6]$ |
| 318. $\sqrt{x} - \sqrt{x-4} = 2;$ | $\sqrt{5+x} - \sqrt{x} = 1.$ | $[4; 4]$ |
| 319. $7 - \sqrt{x} - \sqrt{x+7} = 0;$ | $\sqrt{x+1} + \sqrt{x-1} = 0.$ | $[9; 0]$ |
| 320. $\sqrt{x+7} + \sqrt{x+2} = 5;$ | $\sqrt{x+9} + \sqrt{25-x} - 8 = 0.$ | $[2; 0, 16]$ |
| 331. $\sqrt{x+1} - 3 + \sqrt{x+2} = 0;$ | $\sqrt{2+x} + \sqrt{3-x} - \sqrt{5} = 0.$ | $\left[\frac{7}{9}; -2, 3\right]$ |
| 332. $\sqrt{34+x} - \sqrt{3-x} = 5;$ | $\sqrt{8-x} + \sqrt{x-4} - 2 = 0.$ | $[2; 4, 8]$ |
| 333. $\sqrt{x+20} - \sqrt{x-1} = 3;$ | $\sqrt{x+15} + \sqrt{x-13} = 14.$ | $[5; 49]$ |
| 334. $\sqrt{x-2} + \sqrt{x-2} = 0;$ | $\sqrt{3-x} + \sqrt{x-1} - 2 = 0.$ | $\left[\frac{9}{4}; 2\right]$ |

Risolvere le seguenti disequazioni lineari:

$$5. \quad 8x - 2 > 5x + 4; \quad x - 5 > 7x + 2. \quad \left[x > 2; x < -\frac{7}{6} \right]$$

$$6. \quad \frac{3x+4}{2} < 1 - \frac{5-2x}{3}; \quad \frac{x\sqrt{2}}{3} > 1 + \frac{8-x}{9}. \quad \left[x < -\frac{16}{5}; x > 3\sqrt{2} - 1 \right]$$

$$7. \quad (2x+1)^2 - 8 < (2x-1)^2; \quad \frac{1}{2} \left[x - \left(1 + \frac{25}{26} \right) \right] - \frac{2(1-3x)}{13} > x. \quad \left[x < 1; x < -\frac{59}{2} \right]$$

$$10. \quad (x + \sqrt{2})(x - \sqrt{3}) < 2(x+2) - x(2-x) - 7. \quad [x > \sqrt{3}]$$

$$11. \quad (x\sqrt{2} - 1)^2 + 1 > 3\sqrt{2} + 2x(x-3); \quad \frac{x}{\sqrt{3} + \sqrt{2}} + \frac{2-3x}{\sqrt{2} - \sqrt{3}} + \sqrt{2} > 0. \quad \left[x > \frac{\sqrt{2}}{2}; x > \frac{1}{2} \right]$$

$$12. \quad \frac{(2x-3)^2}{8} + \frac{(\sqrt{3}+x)(\sqrt{3}-x)}{2} \leq \frac{(x+1)^2 - (x+\sqrt{2})(x-\sqrt{2})}{6}. \quad \left[x \geq \frac{51}{44} \right]$$

$$13. \quad \frac{x}{\sqrt{2}} + \frac{\sqrt{2}}{\sqrt{2}-2} > x - \frac{1}{2-\sqrt{2}}. \quad [x < -(\sqrt{2}+1)]$$

$$14. \quad \frac{(x+\sqrt{2})(\sqrt{2}-x)}{4} + \frac{x}{3} > \frac{2(x+1) - 3(1-2x)}{6} - \frac{1}{4}x^2. \quad \left[x < \frac{2}{3} \right]$$

Risolvere le seguenti disequazioni di II grado:

$$66. \quad x^2 + 4x + 4 > 0; \quad 5x^2 - 3x + 2 < 0. \quad [x \neq -2; S = \emptyset]$$

$$67. \quad 3x^2 - 5x + 9 > 0; \quad 16x^2 - 8x + 1 \leq 0. \quad \left[S = \mathbb{R}; x = \frac{1}{4} \right]$$

$$68. \quad 3x^2 + 1 > 0; \quad x^2 < 3x + 4. \quad [S = \mathbb{R}; -1 < x < 4]$$

$$69. \quad 3x^2 - 5x \geq 0; \quad 2x^2 + 2x + 5 < 0. \quad \left[x \leq 0, x \geq \frac{5}{3}; S = \emptyset \right]$$

$$70. \quad 3x - \sqrt{3}x^2 > 0; \quad 3x^2 < 4x. \quad \left[0 < x < \sqrt{3}; 0 < x < \frac{4}{3} \right]$$

$$71. \quad x^2 > 6x - 10; \quad 2x^2 < 15 - x. \quad \left[S = \mathbb{R}; -3 < x < \frac{5}{2} \right]$$

$$72. \quad x^2 + 32 < 10x; \quad 4x^2 - 7 < 2x^2 + 25. \quad [S = \emptyset; -4 < x < 4]$$

$$39. \quad 2x(x-2) + 2 > x(x-1); \quad x(x-4) + x(x+1) + 1 < 0. \quad \left[x < 1, x > 2; \frac{1}{2} < x < 1 \right]$$

$$40. \quad (5x-3)^2 - 1 > 11(4x+1); \quad (x+1)^2 < 4x^2 - 2(x-1). \quad \left[x < -\frac{1}{25}, x > 3; x < \frac{1}{3}, x > 1 \right]$$

$$41. \quad (x+1)^2 + (x+2)^2 > 41; \quad x(3x-10) > 5(2x-5). \quad \left[x < -6, x > 3; x < \frac{5}{3}, x > 5 \right]$$

$$42. \quad 4(x+1)(x-1) + 2x > 5x^2 - 8x + 4; \quad (x-1)^2 > 2(x+1)^2. \quad [5 - \sqrt{17} < x < 5 + \sqrt{17}; -3 - 2\sqrt{2} < x < -3 + 2\sqrt{2}]$$

$$54. \quad \frac{2(x^2+1)}{3} - (x+2)(x-3) < \frac{(x+5)(x-4)}{3}. \quad [x < -4, x > 5]$$

$$55. \quad \frac{23 + (x-2)(x+1)}{3} - 5 < \frac{(x-1)(x+2)}{2} + \frac{x-x^2}{4}. \quad [4 < x < 9]$$

$$56. \quad \frac{5}{3}(2x+3)(x-1) + \frac{5}{2}(x+1) < \frac{5}{4}(x-1)^2 + 5. \quad \left[-\frac{21}{5} < x < 1 \right]$$