

Equazioni di primo grado con frazioni. Livello intermedio. Completati di soluzione guidata.

First-Degree Equations

Résolution des équations du premier degré

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1. $2x - \frac{2}{3} + x + \frac{2}{3} = -\frac{x+1}{3} - \frac{2}{9}$ $\left[-\frac{1}{6}\right]$
2. $\frac{3x-2}{3} + \frac{3+x}{12} = \frac{3x+3}{4} - \frac{1}{6}$ [3]
3. $\frac{2-x}{2} + \frac{3-2x}{11} = \frac{x+1}{3} + 5$ [-1]
4. $\frac{5x-3}{2} + \frac{1}{5} = \frac{x-7}{2} - \frac{7-x}{5}$ [-2]
5. $\frac{1-2x}{2} + \frac{4-4x}{10} = \frac{2x-13}{10} - \frac{4x-3}{5}$ [2]
6. $\frac{2x-3}{6} + \frac{21-x}{3} - \frac{5}{6} = \frac{21-x}{3} - \frac{x+1}{12}$ [3]
7. $4x - \frac{x+3}{4} - \frac{5 \cdot (x+1)}{3} = \frac{3 \cdot (x-2)}{2} - \frac{4 \cdot (x+1)}{3}$ [-1]
8. $\frac{3x-1}{6} + \frac{3x-1}{4} - \frac{4-x}{3} = \frac{x+2}{12} + \frac{2}{3} + \frac{11}{12}$ $\left[\frac{7}{3}\right]$
9. $\frac{x+1}{2} - \frac{3-x}{4} = 2 - \frac{1}{3} \cdot (6-2x)$ [3]
10. $\frac{3 \cdot (2x-5)}{4} - \frac{4 \cdot (x-2)}{5} + \frac{-10x+10}{10} = \frac{x-12}{10}$ $\left[\frac{1}{8}\right]$
11. $\frac{3 \cdot (2x+1)}{5} - \frac{3 \cdot (1+x)}{15} = 2 + \frac{15x-2}{20}$ [6]
12. $3 \cdot \left(\frac{5}{2} - \frac{x+16}{4}\right) - (x-2) - \frac{1}{4} = -\frac{2x+1}{4}$ [-2]
13. $\frac{2x+1}{4} - (x-2) = -3 \cdot \left(\frac{5}{2} - \frac{x+16}{4}\right) + \frac{1}{4}$ [-2]

14. $\frac{3 \cdot (x-2)}{4} + \frac{1}{2}x - x = \frac{x-1}{2} - \frac{2 \cdot (x+3)}{4} + \frac{1}{6}$ $\left[-\frac{4}{3} \right]$
15. $2x - \frac{9}{4} + 3 \cdot (x-1) = 2 \cdot \left(x - \frac{1}{3} \right) - \frac{5}{6}$ $\left[\frac{5}{4} \right]$
16. $\frac{3}{4} \cdot \left(\frac{x+1}{2} - \frac{x+2}{6} \right) = x + \frac{3}{2}$ $\left[-\frac{11}{6} \right]$
17. $\frac{3}{4} \cdot (2x-5) - \frac{4 \cdot (x-2)}{5} - \frac{3x-3}{3} = \frac{x-12}{10}$ $\left[\frac{1}{8} \right]$
18. $\frac{1}{3} \cdot \left(\frac{3x-1}{2} - \frac{x+2}{3} \right) = \frac{1}{9}x - \frac{4}{9}$ $\left[-\frac{1}{5} \right]$
19. $\frac{3 \cdot (2x-1)}{4} - \frac{5 \cdot (3x-5)}{3} = \frac{7-4x}{12} + \frac{2}{3}$ [2]
20. $-\frac{x}{2} = \frac{x+2}{5} - \frac{7}{10}x$ [imposs.]
21. $\frac{5x-6}{4} + 1 - \frac{2x+1}{3} = x$ [-2]
22. $\frac{1}{6} \cdot (4+x) = 1 - \frac{1}{9} \cdot (1-2x)$ [0]
23. $\frac{1+3x}{2} + \frac{1}{3} = \frac{x+6}{6} + \frac{x-2}{2}$ $\left[-1 \right]$
(*)
24. $\frac{x}{3} - \frac{x-4}{2} = \frac{6-x}{6} + 1$ [indeterm.]
(*)
25. $\frac{1-x}{4} - \frac{2x-1}{2} = \frac{3x-1}{4} - x - \frac{2}{3}$ $\left[\frac{5}{3} \right]$
(*)
26. $\frac{1}{3} \left(x - \frac{1}{2} \right) - \frac{1}{2} \left(x - \frac{1}{3} \right) = \frac{x-4}{2}$ $\left[3 \right]$
(*)
27. $\frac{3x-1}{4} - \frac{1}{2} = \frac{2(2x+3)}{5} - \frac{x+3}{2}$ [1]
28. $\frac{2x+3}{2} - \frac{3(x+2)}{4} = \frac{1}{3} - \frac{2-x}{3}$ [4]

$$29. \quad \frac{2(x+3)}{15} = \frac{2x+1}{3} - \frac{x-2}{5} \quad [-1]$$

$$30. \quad \frac{x-7}{3} - \frac{2x-1}{15} - \frac{8}{15} = \frac{3x-1}{10} - \frac{x-1}{2} \quad [8]$$

$$31. \quad \frac{13x-2}{12} + \frac{2-3x}{10} - \frac{x+1}{5} = 1 \quad [2]$$

$$32. \quad \frac{3x-9}{2} + 3x-3 = \frac{x+1}{4} + x+2 \quad [3]$$

[soluzione](#)

$$33. \quad \frac{3 \cdot (x+1) - x}{3} + 4x = 3 + \frac{2x-2}{3} \quad \left[\frac{1}{3} \right]$$

[soluzione](#)

(*) Per gentile concessione della Commissione e-learning IPSSCART B. Stringher – Udine

Soluzioni

$$2x - \frac{2}{3} + x + \frac{2}{3} = -\frac{x+1}{3} - \frac{2}{9}$$

$$2x + x = -\frac{x+1}{3} - \frac{2}{9}$$

$$3x = -\frac{x+1}{3} - \frac{2}{9}$$

$$27x = -3 \cdot (x+1) - 2$$

$$27x = -3x - 3 - 2$$

$$27x + 3x = -5$$

$$x = -\frac{5}{30} = -\frac{1}{6}$$

$$2x - \frac{2}{3} + x + \frac{2}{3} = -\frac{x+1}{3} - \frac{2}{9}$$

$$2 \cdot \left(-\frac{1}{6}\right) - \frac{1}{6} = -\frac{-\frac{1}{6}+1}{3} - \frac{2}{9}$$

$$-\frac{1}{3} - \frac{1}{6} = -\frac{-1+6}{6} - \frac{2}{9}$$

$$\frac{-2-1}{6} = -\left(+\frac{5}{6}\right) \cdot \frac{1}{3} - \frac{2}{9}$$

$$-\frac{3}{6} = -\frac{5}{18} - \frac{2}{9}$$

$$-\frac{1}{2} = \frac{-5-4}{18}$$

$$-\frac{1}{2} = -\frac{9}{18}$$

$x - \frac{x-1}{3} = -1 - \frac{x+2}{2}$ $6x - 2(x-1) = -6 - 3(x+2)$ $6x - 2x + 2 = -6 - 3x - 6$ $4x + 2 = -3x - 12$ $4x + 3x = -2 - 12$ $x = 1$	
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$$\frac{3x-2}{3} + \frac{3+x}{12} = \frac{3x+3}{4} - \frac{1}{6}$$

$$x - \frac{2}{3} + \frac{3}{12} + \frac{1}{12}x = \frac{3}{4}x + \frac{3}{4} - \frac{1}{6}$$

$$x + \frac{1}{12}x - \frac{3}{4}x = +\frac{3}{4} - \frac{1}{6} + \frac{2}{3} - \frac{3}{12}$$

$$\frac{12+1-9}{12}x = \frac{9-2+8-3}{12}$$

$$\frac{4}{12}x = \frac{12}{12}$$

$$x = \frac{12}{12} \cdot \frac{12}{4}$$

$$x = 3$$

$$\frac{3 \cdot 3 - 2}{3} + \frac{3+3}{12} = \frac{3 \cdot 3 + 3}{4} - \frac{1}{6}$$

$$\frac{9-2}{3} + \frac{6}{12} = \frac{9+3}{4} - \frac{1}{6}$$

$$\frac{7}{3} + \frac{1}{2} = \frac{12^3}{4_1} - \frac{1}{6}$$

$$\frac{14+3}{6} = \frac{18-1}{6}$$

$$\frac{17}{6} = \frac{17}{6}$$

$$\frac{2-x}{2} + \frac{3-2x}{11} = \frac{x+1}{3} + 5$$

$$\frac{33 \cdot (2-x) + 6 \cdot (3-2x)}{66} = \frac{22 \cdot (x+1) + 66 \cdot 5}{66}$$

$$66 - 33x + 18 - 12x = 22x + 22 + 330$$

$$-33x - 12x - 22x = +22 + 330 - 66 - 18$$

$$-45x - 22x = +352 - 84$$

$$-67x = 268$$

$$x = \frac{268}{-67} = -1$$

$$\frac{2-x}{2} + \frac{3-2x}{11} = \frac{x+1}{3} + 5$$

$$\frac{2+4}{2} + \frac{3-2 \cdot (-4)}{11} = \frac{-4+1}{3} + 5$$

$$\frac{6}{2} + \frac{3+8}{11} = -\frac{3}{3} + 5$$

$$3 + \frac{11}{11} = -1 + 5$$

$$4 = 4$$

verificata

$$\frac{5x-3}{2} + \frac{1}{5} = \frac{x-7}{2} - \frac{7-x}{5}$$

$$10 \cdot \frac{25x-15+2}{10} = \frac{5x-35-14+2x}{10} \cdot 10$$

$$25x-15+2 = 5x-35-14+2x$$

$$25x-5x-2x = -35-14+15-2$$

$$20x-2x = -35+1-2$$

$$\frac{18}{18}x = -\frac{36}{18}x$$

$$x = -2$$

$$\frac{5 \cdot (-2) - 3}{2} + \frac{1}{5} = \frac{(-2) - 7}{2} - \frac{7 - (-2)}{5}$$

$$\frac{-10-3}{2} + \frac{1}{5} = -\frac{9}{2} - \frac{7+2}{5}$$

$$-\frac{13}{2} + \frac{1}{5} = -\frac{9}{2} - \frac{9}{5}$$

$$\frac{-65+2}{10} = \frac{-45-18}{10}$$

$$-\frac{63}{10} = -\frac{63}{10}$$



$$\frac{1-2x}{2} + \frac{4-4x}{10} = \frac{2x-13}{10} - \frac{4x-3}{5}$$

$$5 - 10x + 4 - 4x = 2x - 13 - 8x + 6$$

$$-10x - 4x - 2x + 8x = -13 + 6 - 5 - 4$$

$$8x - 16x = 6 - 22$$

$$-8x = -16$$

$$8x = 16$$

$$x = \frac{16}{8} = 2$$

$$\frac{1-4}{2} + \frac{4-8}{10} = \frac{4-13}{10} - \frac{8-3}{5}$$

$$-\frac{3}{2} - \frac{4}{10} = -\frac{9}{10} - \frac{5}{5}$$

$$\frac{-15-4}{10} = \frac{-9-10}{10}$$

$$-\frac{19}{10} = -\frac{19}{10}$$

Verificata

$$\frac{2x-3}{6} + \frac{21-x}{3} - \frac{5}{6} = \frac{21-x}{3} - \frac{x+1}{12}$$

$$2(2x-3) - 2(5) = -(x+1)$$

$$4x - 6 - 10 = -x - 1$$

$$4x + x = -1 + 6 + 10$$

$$5x = 15$$

$$x = \frac{15}{5} = 3$$

$$\frac{(6-3)}{6} + \frac{21-3}{3} - \frac{5}{6} = \frac{21-3}{3} - \frac{3+1}{12}$$

$$\frac{3}{6} + \frac{18}{3} - \frac{5}{6} = \frac{18}{3} - \frac{4}{12}$$

$$\frac{3}{6} + 6 - \frac{5}{6} = \frac{72-4}{12}$$

$$\frac{3+36-5}{6} = \frac{68}{12}$$

$$\frac{34}{6} = \frac{68}{12}$$

$$\frac{34}{6} = \frac{34}{6}$$

Verificata

$$4x - \frac{x+3}{4} - \frac{5 \cdot (x+1)}{3} = \frac{3 \cdot (x-2)}{2} - \frac{4 \cdot (x+1)}{3}$$

$$12 \cdot 4x - 12^3 \cdot \frac{x+3}{4_1} - 12^4 \cdot \frac{5 \cdot (x+1)}{3_1} = 12^6 \cdot \frac{3 \cdot (x-2)}{2_1} - 12^4 \cdot \frac{4 \cdot (x+1)}{3_1}$$

$$48x - 3x - 9 - 20x - 20 = 18x - 36 - 16x - 16$$

$$48x - 3x - 20x - 18x + 16x = -36 - 16 + 9 + 20$$

$$45x - 20x - 2x = -52 + 29$$

$$23x = -23$$

$$x = -\frac{23}{23} = -1$$

$$4x - \frac{x+3}{4} - \frac{5 \cdot (x+1)}{3} = \frac{3 \cdot (x-2)}{2} - \frac{4 \cdot (x+1)}{3}$$

$$4 \cdot (-1) - \frac{-1+3}{4} - \frac{5 \cdot (-1+1)}{3} = \frac{3 \cdot (-1-2)}{2} - \frac{4 \cdot (-1+1)}{3}$$

$$-4 - \frac{2^1}{4_2} = \frac{3 \cdot (-3)}{2}$$

$$\frac{-8-1}{2} = -\frac{9}{2}$$

$$-\frac{9}{2} = -\frac{9}{2}$$

$$\frac{3x-1}{6} + \frac{3x-1}{4} - \frac{4-x}{3} = \frac{x+2}{12} + \frac{2}{3} + \frac{11}{12}$$

$$2 \cdot (3x-1) + 3 \cdot (3x-1) - 4 \cdot (4-x) = x+2+4 \cdot 2+11$$

$$6x-2+9x-3-16+4x = x+2+8+11$$

$$6x+9x+4x-x = 2+8+11+2+3+16$$

$$18x = 42$$

$$x = \frac{42}{18} = \frac{7}{3}$$

$$3 \cdot \left(\frac{7}{3}\right) - 1 - 3 \cdot \left(\frac{7}{3}\right) - 1 - 4 - \frac{7}{3} = \frac{7}{3} + 2 + \frac{2}{3} + \frac{11}{12}$$

$$\frac{7-1}{6} + \frac{7-1}{4} - \frac{12-7}{3} = \frac{7+6}{12} + \frac{2}{3} + \frac{11}{12}$$

$$1 + \frac{6}{4} - \frac{5}{3} \cdot \frac{1}{3} = \frac{13}{3} \cdot \frac{1}{12} + \frac{2}{3} + \frac{11}{12}$$

$$\frac{18+27-10}{18} = \frac{13+24+33}{36}$$

$$\frac{35}{18} = \frac{75^{35}}{36_{18}}$$

$$\frac{x+1}{2} - \frac{3-x}{4} = 2 - \frac{1}{3}(6-2x)$$

$$6x+6-9+3x = 24-4(6-2x)$$

$$9x-3 = 24-24+8x$$

$$9x-8x = 3$$

$$x = 3$$

$$\frac{3+1}{2} - \frac{3-3}{4} = 2 - \frac{1}{3}(6-6)$$

$$\frac{4}{2} = 2$$

$$2 = 2$$

verificata

$$\frac{3 \cdot (2x-5)}{4} - \frac{4 \cdot (x-2)}{5} + \frac{-10x+10}{10} = \frac{x-12}{10}$$

$$\frac{6x-15}{4} - \frac{4x-8}{5} + \frac{-10x+10}{10} = \frac{x-12}{10}$$

$$+\frac{6}{4}x - \frac{15}{4} - \frac{4}{5}x + \frac{8}{5} - \frac{10}{10}x + \frac{10}{10} = +\frac{1}{10}x - \frac{12}{10}$$

$$+\frac{6}{4}x - \frac{4}{5}x - \frac{10}{10}x - \frac{1}{10}x = -\frac{12}{10} + \frac{15}{4} - \frac{8}{5} - \frac{10}{10}$$

$$+\frac{30-16-20-2}{20}x = \frac{-24+75-32-20}{20}$$

$$-\frac{8}{20}x = -\frac{1}{20}$$

$$\frac{8}{20}x = \frac{1}{20}$$

$$x = \frac{1}{20} \cdot \frac{20}{8} = \frac{1}{8}$$

$$3 \cdot \left(2\frac{1}{8}-5\right) - 4 \cdot \left(\frac{1}{8}-2\right) - \frac{10}{8} + 10 = \frac{1}{8} - 12$$

$$\frac{3 \cdot \left(\frac{1}{4}-5\right) - 4 \cdot \left(\frac{1}{8}-2\right) - \frac{10}{8} + 10}{4} = \frac{\frac{1}{8}-12}{10}$$

$$\frac{3 \cdot \left(\frac{1-20}{4}\right) - 4 \cdot \left(\frac{1-16}{8}\right) - \frac{10+80}{8}}{4} = \frac{\frac{1-96}{8}}{10}$$

$$\frac{3 \cdot \left(-\frac{19}{4}\right) - 4 \cdot \left(-\frac{15}{8}\right) - \frac{90}{8}}{4} = \frac{-\frac{95}{8}}{10}$$

$$-\frac{57}{4} \cdot \left(\frac{1}{4}\right) - \left(-\frac{15}{2}\right) \cdot \left(\frac{1}{5}\right) + \frac{70}{8} \cdot \left(\frac{1}{10}\right) = -\frac{95}{8} \cdot \frac{1}{10}$$

$$-\frac{57}{16} + \frac{3}{2} + \frac{7}{4} = -\frac{19}{8} \cdot \frac{1}{2}$$

$$-\frac{57+24+14}{16} = -\frac{19}{16}$$

$$-\frac{19}{16} = -\frac{19}{16}$$

$$\begin{aligned} \frac{3 \cdot (2x+1)}{5} - \frac{3 \cdot (1+x)}{15} &= 2 + \frac{15x-2}{20} \\ 60 \frac{3(2x+1)}{5} - 60 \frac{3(1+x)}{15} &= 60 \cdot 2 + 60 \frac{15x-2}{20} \\ 12 \frac{3(2x+1)}{1} - 4 \frac{3(1+x)}{1} &= 120 + 3 \frac{15x-2}{1} \\ 36(2x+1) - 12(1+x) &= 120 + 3(15x-2) \\ 72x + 36 - 12 - 12x &= 120 + 45x - 6 \\ 72x - 12x - 45x &= 120 - 6 - 36 + 12 \\ 60x - 45x &= 120 - 30 \\ 15x &= 90 \\ x &= 90/15 = 6 \end{aligned}$$

$$\begin{aligned} \frac{3 \cdot (2x+1)}{5} - \frac{3 \cdot (1+x)}{15} &= 2 + \frac{15x-2}{20} \\ \frac{3 \cdot (2 \cdot 6+1)}{5} - \frac{3 \cdot (1+6)}{15} &= 2 + \frac{15 \cdot 6-2}{20} \\ \frac{3 \cdot (13)}{5} - \frac{3 \cdot (7)}{15} &= 2 + \frac{90-2}{20} \\ \frac{39}{5} - \frac{21}{15} &= 2 + \frac{88}{20} \\ \frac{117-21}{15} &= \frac{40+88}{20} \\ \frac{96}{15} &= \frac{128}{20} \\ \frac{32}{5} &= \frac{32}{5} \end{aligned}$$

Oppure

$$\begin{aligned} \frac{6x+3}{5} - \frac{3+3x}{15} &= 2 + \frac{15}{20}x - \frac{2}{20} \\ \frac{6}{5}x + \frac{3}{5} - \frac{3}{15} - \frac{3}{15}x &= 2 + \frac{15}{20}x - \frac{2}{20} \\ \frac{6}{5}x - \frac{3}{15}x - \frac{15}{20}x &= 2 - \frac{2}{20} - \frac{3}{5} + \frac{3}{15} \\ \frac{6}{5}x - \frac{1}{5}x - \frac{3}{4}x &= 2 - \frac{1}{10} - \frac{3}{5} + \frac{1}{5} \\ \frac{24-4-15}{20}x &= \frac{20-1-6+2}{10} \\ \frac{5}{20}x &= \frac{15}{10} \\ x &= \frac{15}{10} \cdot \frac{20}{5} = \frac{3 \cdot 2}{1} = 6 \end{aligned}$$

$$3 \cdot \left(\frac{5}{2} - \frac{x+16}{4} \right) - (x-2) - \frac{1}{4} = -\frac{2x+1}{4}$$

$$4 \cdot 3 \cdot \left(\frac{5}{2} - \frac{x+16}{4} \right) - 4 \cdot (x-2) - 4 \cdot \frac{1}{4} = 4 \cdot \left(-\frac{2x+1}{4} \right)$$

$$12 \cdot \left(\frac{5}{2} - \frac{1}{4}x - \frac{16}{4} \right) - 4 \cdot (x-2) - 1 = 4 \cdot \left(-\frac{2}{4}x - \frac{1}{4} \right)$$

$$30 - 3x - 48 - 4x + 8 - 1 = -2x - 1$$

$$-3x - 4x + 2x = -1 - 30 + 48 - 8 + 1$$

$$-5x = 10$$

$$x = -2$$

Per disegnare la retta corrispondente

$$3 \cdot \left(\frac{5}{2} - \frac{x+16}{4} \right) - (x-2) - \frac{1}{4} = -\frac{2x+1}{4}$$

$$30 - 3x - 48 - 4x + 8 - 1 = -2x - 1$$

$$-3x - 4x + 2x = -1 - 30 + 48 - 8 + 1$$

$$0 = 3x + 4x - 2x - 1 - 30 + 48 - 8 + 1$$

$$0 = 5x + 10$$

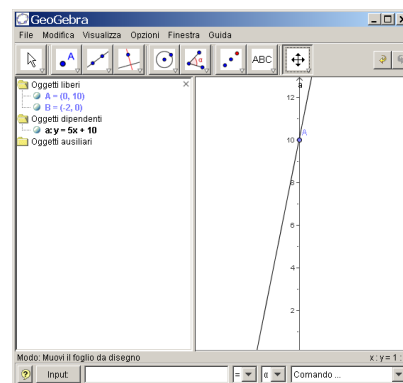
$$y = 5x + 10$$

$$3 \cdot \left(\frac{5}{2} - \frac{-2+16}{4} \right) - (-2-2) - \frac{1}{4} = -\frac{-4+1}{4}$$

$$3 \cdot \left(\frac{5}{2} - \frac{7}{2} \right) + 4 - \frac{1}{4} = +\frac{3}{4}$$

$$-3 + 4 - \frac{1}{4} = +\frac{3}{4}$$

$$\frac{3}{4} = +\frac{3}{4}$$



$$\frac{2x+1}{4} - (x-2) = -3 \cdot \left(\frac{5}{2} - \frac{x+16}{4} \right) + \frac{1}{4}$$

$$4 \cdot \frac{2x+1}{4} - 4 \cdot (x-2) = 4 \cdot (-3) \cdot \left(\frac{5}{2} - \frac{x+16}{4} \right) + 4 \cdot \frac{1}{4}$$

$$4 \cdot \left(\frac{2}{4}x + \frac{1}{4} \right) - 4 \cdot (x-2) = -12 \cdot \left(\frac{5}{2} - \frac{1}{4}x - \frac{16}{4} \right) + 1$$

$$2x + 1 - 4x + 8 = -30 + 3x + 48 + 1$$

$$2x - 4x - 3x = -30 + 48 + 1 - 1 - 8$$

$$-5x = 10$$

$$x = -2$$

Per disegnare la retta corrispondente

$$\frac{2x+1}{4} - (x-2) = -3 \cdot \left(\frac{5}{2} - \frac{x+16}{4} \right) + \frac{1}{4}$$

$$2x + 1 - 4x + 8 = -30 + 3x + 48 + 1$$

$$2x - 4x - 3x = -30 + 48 + 1 - 1 - 8$$

$$0 = -2x + 4x + 3x - 30 + 48 + 1 - 1 - 8$$

$$0 = 5x + 10$$

$$y = 5x + 10$$

$$\frac{-4+1}{4} - (-2-2) = -3 \cdot \left(\frac{5}{2} - \frac{-2+16}{4} \right) + \frac{1}{4}$$

$$-\frac{3}{4} + 4 = -3 \cdot \left(\frac{5}{2} - \frac{7}{2} \right) + \frac{1}{4}$$

$$-\frac{3}{4} + 4 = 3 + \frac{1}{4}$$

$$\frac{13}{4} = \frac{13}{4}$$

$$\frac{3 \cdot (x-2)}{4} + \frac{1}{2}x - x = \frac{x-1}{2} - \frac{2 \cdot (x+3)}{4} + \frac{1}{6}$$

$$\frac{3 \cdot 3 \cdot (x-2) + 6x - 12x}{12} = \frac{6 \cdot (x-1) - 3 \cdot 2 \cdot (x+3) + 2}{12}$$

$$9 \cdot (x-2) - 6x = 6x - 6 - 6 \cdot (x+3) + 2$$

$$9x - 18 - 6x = 6x - 6 - 6x - 18 + 2$$

$$9x - 6x = -6 + 2$$

$$3x = -4$$

$$x = -\frac{4}{3}$$

$$\frac{3 \cdot \left(-\frac{4}{3} - 2\right)}{4} + \frac{1}{2} \left(-\frac{4}{3}\right) - \left(-\frac{4}{3}\right) = \frac{-\frac{4}{3} - 1}{2} - \frac{2 \cdot \left(-\frac{4}{3} + 3\right)}{4} + \frac{1}{6}$$

$$\frac{3 \cdot \left(-\frac{10}{3}\right)}{4} - \frac{2}{3} + \frac{4}{3} = \frac{-\frac{7}{3}}{2} - \frac{2 \cdot \left(+\frac{5}{3}\right)}{4} + \frac{1}{6}$$

$$-\frac{10}{4} - \frac{2}{3} + \frac{4}{3} = -\frac{7}{6} - \frac{\frac{10}{3}}{4} + \frac{1}{6}$$

$$\frac{-30 - 8 + 16}{12} = -\frac{7}{6} - \frac{10}{12} + \frac{1}{6}$$

$$-\frac{22}{12} = \frac{-14 - 10 + 2}{12}$$

$$-\frac{11}{6} = -\frac{22}{12}$$

$$2x - \frac{9}{4} + 3 \cdot (x-1) = 2 \cdot \left(x - \frac{1}{3}\right) - \frac{5}{6}$$

$$2x - \frac{9}{4} + 3x - 3 = 2x - \frac{2}{3} - \frac{5}{6}$$

$$3x = -\frac{2}{3} - \frac{5}{6} + \frac{9}{4} + 3$$

$$3x = \frac{-8 - 10 + 27 + 36}{12}$$

$$3x = \frac{45}{12}$$

$$x = \frac{45}{12} \cdot \frac{1}{3} =$$

$$x = \frac{15}{12} = \frac{5}{4}$$

$$2 \cdot \frac{5}{4} - \frac{9}{4} + 3 \cdot \left(\frac{5}{4} - 1\right) = 2 \cdot \left(\frac{5}{4} - \frac{1}{3}\right) - \frac{5}{6}$$

$$\frac{5}{2} - \frac{9}{4} + 3 \cdot \left(\frac{1}{4}\right) = 2 \cdot \left(\frac{15 - 4}{12}\right) - \frac{5}{6}$$

$$\frac{5}{2} - \frac{9}{4} + \frac{3}{4} = \frac{11}{6} - \frac{5}{6}$$

$$\frac{30 - 27 + 9}{12} = \frac{6}{6}$$

$$\frac{12}{12} = \frac{6}{6}$$

$$\frac{3}{4} \cdot \left(\frac{x+1}{2} - \frac{x+2}{6} \right) = x + \frac{3}{2}$$

$$\frac{3}{4} \cdot \left(\frac{1}{2}x + \frac{1}{2} - \frac{1}{6}x - \frac{2}{6} \right) = x + \frac{3}{2}$$

$$\frac{3}{4} \cdot \left(\frac{3-1}{6}x + \frac{3-2}{6} \right) = x + \frac{3}{2}$$

$$\frac{3}{4} \cdot \left(\frac{2}{6}x + \frac{1}{6} \right) = x + \frac{3}{2}$$

$$\frac{1}{4}x + \frac{1}{8} = x + \frac{3}{2}$$

$$\frac{1}{4}x - x = \frac{3}{2} - \frac{1}{8}$$

$$-\frac{3}{4}x = \frac{11}{8}$$

$$x = \frac{11}{8} \cdot \left(-\frac{4}{3} \right) = -\frac{11}{6}$$

$$\frac{3}{4} \cdot \left(\frac{-\frac{11}{6} + 1}{2} - \frac{-\frac{11}{6} + 2}{6} \right) = -\frac{11}{6} + \frac{3}{2}$$

$$\frac{3}{4} \cdot \left(-\frac{5}{6} \cdot \frac{1}{2} - \frac{1}{6} \cdot \frac{1}{6} \right) = \frac{-11+9}{6}$$

$$\frac{3}{4} \cdot \left(-\frac{5}{12} - \frac{1}{36} \right) = -\frac{2}{6}$$

$$\frac{3}{4} \cdot \left(-\frac{16}{36} \right) = -\frac{1}{3}$$

$$\frac{1}{1} \cdot \left(-\frac{4}{12} \right) = -\frac{1}{3}$$

$$-\frac{1}{3} = -\frac{1}{3}$$

$$\frac{3}{4} \cdot (2x-5) - \frac{4 \cdot (x-2)}{5} - \frac{3x-3}{3} = \frac{x-12}{10}$$

$$\frac{6}{4}x - \frac{15}{4} - \frac{4}{5}x + \frac{8}{5} - x + 1 = \frac{1}{10}x - \frac{12}{10}$$

$$30x - 75 - 16x + 32 - 20x + 20 = 2x - 24$$

$$30x - 16x - 20x - 2x = -24 + 75 - 32 - 20$$

$$30x - 38x = 51 - 52$$

$$-8x = -1$$

$$8x = 1$$

$$x = \frac{1}{8}$$

$$\frac{3}{4} \cdot \left(2 \left(\frac{1}{8} \right) - 5 \right) - \frac{4 \cdot \left(\frac{1}{8} - 2 \right)}{5} - \frac{3 \left(\frac{1}{8} \right) - 3}{3} = \frac{\frac{1}{8} - 12}{10}$$

$$\frac{3}{4} \cdot \left(\frac{1}{4} - 5 \right) - \frac{4 \cdot \left(\frac{1-16}{8} \right)}{5} - \frac{\frac{3}{8} - 3}{3} = \frac{1-96}{10}$$

$$\frac{3}{4} \cdot \left(\frac{1-20}{4} \right) - \frac{4 \cdot \left(-\frac{15}{8} \right)}{5} - \frac{\frac{3-24}{8}}{3} = \frac{-95}{10}$$

$$\frac{3}{4} \cdot \left(-\frac{19}{4} \right) - \frac{-\frac{15}{2}}{5} - \frac{-\frac{21}{8}}{3} = \frac{-95}{10} \cdot \frac{1}{10}$$

$$-\frac{57}{16} - \left(-\frac{15}{2} \right) \cdot \frac{1}{5} - \left(-\frac{21}{8} \right) \cdot \frac{1}{3} = -\frac{19}{8} \cdot \frac{1}{2}$$

$$-\frac{57}{16} - \left(-\frac{3}{2} \right) - \left(-\frac{7}{8} \right) = -\frac{19}{16}$$

$$-\frac{57}{16} + \frac{3}{2} + \frac{7}{8} = -\frac{19}{16}$$

$$\frac{-57 + 24 + 14}{16} = -\frac{19}{16}$$

$$-\frac{19}{16} = -\frac{19}{16}$$

$$\frac{1}{3} \cdot \left(\frac{3x-1}{2} - \frac{x+2}{3} \right) = \frac{1}{9}x - \frac{4}{9}$$

$$\frac{1}{3} \cdot \left(\frac{3}{2}x - \frac{1}{2} - \frac{1}{3}x - \frac{2}{3} \right) = \frac{1}{9}x - \frac{4}{9}$$

$$\frac{1}{2}x - \frac{1}{6} - \frac{1}{9}x - \frac{2}{9} = \frac{1}{9}x - \frac{4}{9}$$

$$\frac{1}{2}x - \frac{1}{9}x - \frac{1}{9}x = -\frac{4}{9} + \frac{1}{6} + \frac{2}{9}$$

$$\frac{9-2-2}{18}x = \frac{-8+3+4}{18}$$

$$\frac{5}{18}x = -\frac{1}{18}$$

$$x = -\frac{1}{18} \cdot \frac{18}{5} = -\frac{1}{5}$$

$$\frac{1}{3} \cdot \left(\frac{3 \cdot \left(-\frac{1}{5} \right) - 1}{2} - \frac{-\frac{1}{5} + 2}{3} \right) = \frac{1}{9} \cdot \left(-\frac{1}{5} \right) - \frac{4}{9}$$

$$\frac{1}{3} \cdot \left(\frac{-\frac{3}{5} - 1}{2} - \frac{\frac{9}{5}}{3} \right) = -\frac{1}{45} - \frac{4}{9}$$

$$\frac{1}{3} \cdot \left(-\frac{8}{5} \cdot \frac{1}{2} - \frac{9}{5} \cdot \frac{1}{3} \right) = \frac{-1-20}{45}$$

$$\frac{1}{3} \cdot \left(-\frac{4}{5} - \frac{3}{5} \right) = -\frac{21}{45}$$

$$\frac{1}{3} \cdot \left(-\frac{7}{5} \right) = -\frac{7}{15}$$

$$-\frac{7}{15} = -\frac{7}{15}$$

$$\frac{3 \cdot (2x-1)}{4} - \frac{5 \cdot (3x-5)}{3} = \frac{7-4x}{12} + \frac{2}{3}$$

$$12 \cdot \frac{3 \cdot (2x-1)}{4} - 12 \cdot \frac{5 \cdot (3x-5)}{3} = 12 \cdot \frac{7-4x}{12} + 12 \cdot \frac{2}{3}$$

$$3 \cdot 3 \cdot (2x-1) - 4 \cdot 5 \cdot (3x-5) = 7-4x+4 \cdot 2$$

$$9 \cdot (2x-1) - 20 \cdot (3x-5) = 7-4x+8$$

$$18x-9-60x+100 = 7-4x+8$$

$$18x-60x+4x = 7+8+9-100$$

$$-38x = -76$$

$$38x = 76$$

$$x = 76/38 = 2$$

$$\frac{3 \cdot (2 \cdot 2 - 1)}{4} - \frac{5 \cdot (3 \cdot 2 - 5)}{3} = \frac{7 - 4 \cdot 2}{12} + \frac{2}{3}$$

$$\frac{3 \cdot (4-1)}{4} - \frac{5 \cdot (6-5)}{3} = \frac{7-8}{12} + \frac{2}{3}$$

$$\frac{3 \cdot (3)}{4} - \frac{5 \cdot (1)}{3} = -\frac{1}{12} + \frac{2}{3}$$

$$\frac{9}{4} - \frac{5}{3} = \frac{-1+8}{12}$$

$$\frac{27-20}{12} = \frac{7}{12}$$

$$\frac{7}{12} = \frac{7}{12}$$

$$\frac{5x-6}{4} + 1 - \frac{2x+1}{3} = x$$

$$\frac{5}{4}x - \frac{6}{4} + 1 - \frac{2}{3}x - \frac{1}{3} = x$$

$$\frac{5}{4}x - \frac{2}{3}x - x = -1 + \frac{6}{4} + \frac{1}{3}$$

$$\frac{15-8-12}{12}x = \frac{-12+18+4}{12}$$

$$-\frac{5}{12}x = \frac{10}{12}$$

$$x = \frac{10}{12} \cdot \left(-\frac{12}{5}\right) = -2$$

$$\frac{5 \cdot (-2) - 6}{4} + 1 - \frac{2 \cdot (-2) + 1}{3} = -2$$

$$\frac{-10-6}{4} + 1 - \frac{-4+1}{3} = -2$$

$$-\frac{16}{4} + 1 - \left(-\frac{3}{3}\right) = -2$$

$$-4 + 1 + 1 = -2$$

$$-2 = -2$$

$$-\frac{x}{2} = \frac{x+2}{5} - \frac{7}{10}x$$

$$-\frac{1}{2}x = \frac{1}{5}x + \frac{2}{5} - \frac{7}{10}x$$

$$-\frac{1}{2}x - \frac{1}{5}x + \frac{7}{10}x = +\frac{2}{5}$$

$$\frac{-5-2+7}{10}x = +\frac{2}{5}$$

$$0x = +\frac{2}{5}$$

impossibile

oppure

$$-\frac{x}{2} = \frac{x+2}{5} - \frac{7}{10}x$$

$$-5x = 2(x+2) - 7x$$

$$-5x = 2x + 4 - 7x$$

$$-5x - 2x + 7x = 4$$

$$0x = 4$$

impossibile

$$\frac{1}{6} \cdot (4+x) = 1 - \frac{1}{9} \cdot (1-2x)$$

$$18 \cdot \frac{1}{6} \cdot (4+x) = 18 \cdot 1 - 18 \cdot \frac{1}{9} \cdot (1-2x)$$

$$3 \cdot (4+x) = 18 - 2 \cdot (1-2x)$$

$$1812 + 3x = 18 - 2 + 4x$$

$$3x - 4x = 18 - 2 - 12$$

$$-x = 4$$

$$x = -4$$

$$\frac{1}{6} \cdot (4-4) = 1 - \frac{1}{9} \cdot (1+8)$$

$$0 = 1 - 1$$

$$0 = 0$$

$$\frac{1+3x}{2} + \frac{1}{3} = \frac{x+6}{6} + \frac{x-2}{2}$$

$$6 \cdot \frac{1+3x}{2} + 6 \cdot \frac{1}{3} = 6 \cdot \frac{x+6}{6} + 6 \cdot \frac{x-2}{2}$$

$$3 \cdot (1+3x) + 2 = x+6 + 3 \cdot (x-2)$$

$$3+9x+2 = x+6+3x-6$$

$$9x-x-3x = -3-2$$

$$5x = -5$$

$$x = -1$$

$$\frac{1+3 \cdot (-1)}{2} + \frac{1}{3} = \frac{-1+6}{6} + \frac{-1-2}{2}$$

$$\frac{1-3}{2} + \frac{1}{3} = \frac{5}{6} - \frac{3}{2}$$

$$-\frac{2}{2} + \frac{1}{3} = \frac{5-9}{6}$$

$$\frac{-3+1}{3} = \frac{5-9}{6}$$

$$-\frac{2}{3} = -\frac{2^2}{6_3}$$

$$\frac{x}{3} - \frac{x-4}{2} = \frac{6-x}{6} + 1$$

$$2x-3 \cdot (x-4) = 6-x+6$$

$$2x-3x+12 = 6-x+6$$

$$2x-3x+x = 6+6-12$$

$$0x = 0$$

indeterminata

$$\frac{1-x}{4} - \frac{2x-1}{2} = \frac{3x-1}{4} - x - \frac{2}{3}$$

$$3-3x-12x+6 = 9x-3-12x-8$$

$$-3x-12x-9x+12x = -3-8-3-6$$

$$-12x = -20$$

$$12x = 20$$

$$x = \frac{20}{12} = \frac{5}{3}$$

$$1 - \frac{5}{3} - \frac{2 \cdot \frac{5}{3} - 1}{2} = \frac{3 \cdot \frac{5}{3} - 1}{4} - \frac{5}{3} - \frac{2}{3}$$

$$-\frac{2}{3} - \frac{\frac{10}{3} - 1}{2} = \frac{5-1}{4} - \frac{5}{3} - \frac{2}{3}$$

$$-\frac{2}{3} - \frac{1}{4} - \frac{\frac{7}{3}}{2} = \frac{4}{4} - \frac{5}{3} - \frac{2}{3}$$

$$-\frac{1}{6} - \frac{7}{3} - \frac{1}{2} = 1 - \frac{5}{3} - \frac{2}{3}$$

$$-\frac{1}{6} - \frac{7}{6} = \frac{3}{3} - \frac{5}{3} - \frac{2}{3}$$

$$-\frac{8^4}{6_3} = -\frac{4}{3}$$

$$\frac{1}{3}\left(x - \frac{1}{2}\right) - \frac{1}{2}\left(x - \frac{1}{3}\right) = \frac{x-4}{2}$$

$$2 \cdot \left(x - \frac{1}{2}\right) - 3 \cdot \left(x - \frac{1}{3}\right) = 3 \cdot (x-4)$$

$$2x - 1 - 3x + 1 = 3x - 12$$

$$2x - 3x - 3x = -12$$

$$-4x = -12$$

$$4x = 12$$

$$x = 3$$

$$\frac{1}{3}\left(3 - \frac{1}{2}\right) - \frac{1}{2}\left(3 - \frac{1}{3}\right) = \frac{3-4}{2}$$

$$\frac{1}{3}\left(\frac{5}{2}\right) - \frac{1}{2}\left(\frac{8}{3}\right) = -\frac{1}{2}$$

$$\frac{5}{6} - \frac{8}{6} = -\frac{1}{2}$$

$$-\frac{3^1}{6_2} = -\frac{1}{2}$$

$$\frac{2x+3}{2} - \frac{3(x+2)}{4} = \frac{1}{3} - \frac{2-x}{3}$$

$$\frac{6(2x+3) - 9(x+2)}{12} = \frac{4 - 4(2-x)}{12}$$

$$12x + 18 - 9x - 18 = 4 - 8 + 4x$$

$$12x - 9x - 4x = 4 - 8$$

$$-x = -4$$

$$x = 4$$

$$\frac{2 \cdot 4 + 3}{2} - \frac{3(4+2)}{4} = \frac{1}{3} - \frac{2-4}{3}$$

$$\frac{8+3}{2} - \frac{3 \cdot 6}{4} = \frac{1}{3} - \frac{-2}{3}$$

$$\frac{11}{2} - \frac{18}{4} = \frac{1}{3} + \frac{2}{3}$$

$$\frac{11}{2} - \frac{9}{2} = \frac{3}{3}$$

$$\frac{2}{2} = 1$$

$$1 = 1$$

$$\frac{2(x+3)}{15} = \frac{2x+1}{3} - \frac{x-2}{5}$$

$$\frac{2(x+3)}{15} = \frac{5(2x+1) - 3(x-2)}{15}$$

$$2x + 6 = 10x + 5 - 3x + 6$$

$$2x - 10x + 3x = 5 + 6 - 6$$

$$-5x = 5$$

$$x = \frac{5}{-5} = -1$$

$$\frac{2(-1+3)}{15} = \frac{2(-1)+1}{3} - \frac{-1-2}{5}$$

$$\frac{2 \cdot 2}{15} = \frac{-2+1}{3} - \frac{-3}{5}$$

$$\frac{4}{15} = -\frac{1}{3} + \frac{3}{5}$$

$$\frac{4}{15} = \frac{-5+9}{15}$$

$$\frac{4}{15} = \frac{4}{15}$$

$$\frac{x-7}{3} - \frac{2x-1}{15} - \frac{8}{15} = \frac{3x-1}{10} - \frac{x-1}{2}$$

$$\frac{10(x-7) - 2(2x-1) - 16}{30} = \frac{3(3x-1) - 15(x-1)}{30}$$

$$10x - 70 - 4x + 2 - 16 = 9x - 3 - 15x + 15$$

$$10x - 4x - 9x + 15x = -3 + 15 + 70 - 2 + 16$$

$$12x = 96$$

$$x = \frac{96}{12} = 8$$

$$\frac{8-7}{3} - \frac{16-1}{15} - \frac{8}{15} = \frac{24-1}{10} - \frac{8-1}{2}$$

$$\frac{1}{3} - \frac{15}{15} - \frac{8}{15} = \frac{23}{10} - \frac{7}{2}$$

$$\frac{5-15-8}{15} = \frac{23-35}{10}$$

$$-\frac{18}{15} = -\frac{12}{10}$$

$$-\frac{6}{5} = -\frac{6}{5}$$

$$\frac{13x-2}{12} + \frac{2-3x}{10} - \frac{x+1}{5} = 1$$

$$\frac{5(13x-2) + 6(2-3x) - 12(x+1)}{60} = \frac{60}{60}$$

$$65x - 10 + 12 - 18x - 12x - 12 = 60$$

$$65x - 18x - 12x = 60 + 10$$

$$35x = 70$$

$$x = \frac{70}{35} = 2$$

$$\frac{13 \cdot 2 - 2}{12} + \frac{2 - 3 \cdot 2}{10} - \frac{2 + 1}{5} = 1$$

$$\frac{26 - 2}{12} + \frac{2 - 6}{10} - \frac{3}{5} = 1$$

$$\frac{24}{12} - \frac{4}{10} - \frac{3}{5} = 1$$

$$2 - \frac{2}{5} - \frac{3}{5} = 1$$

$$2 - 1 = 1$$

$$1 = 1$$

$$\frac{3x-9}{2} + 3x - 3 = \frac{x+1}{4} + x + 2$$

$$6x - 18 + 12x - 12 = x + 1 + 4x + 8$$

$$6x + 12x - x - 4x = 1 + 8 + 18 + 12$$

$$13x = 39$$

$$x = \frac{39}{13} = 3$$

$$\frac{3 \cdot 3 - 9}{2} + 3 \cdot 3 - 3 = \frac{3 + 1}{4} + 3 + 2$$

$$\frac{9 - 9}{2} + 9 - 3 = \frac{4}{4} + 3 + 2$$

$$0 + 9 - 3 = 1 + 3 + 2$$

$$6 = 6$$

$$\frac{3 \cdot (x+1) - x}{3} + 4x = 3 + \frac{2x-2}{3}$$

$$\frac{3 \cdot (x+1) - x + 12x}{3} = \frac{9 + 2x - 2}{3}$$

$$3 \cdot (x+1) - x + 12x = 9 + 2x - 2$$

$$3x + 3 - x + 12x = 2x + 7$$

$$3x - x + 12x - 2x = 7 - 3$$

$$12x = 4$$

$$x = \frac{4}{12} = \frac{1}{3}$$

$$\frac{3 \cdot \left(\frac{1}{3} + 1\right) - \left(\frac{1}{3}\right)}{3} + 4 \cdot \left(\frac{1}{3}\right) = 3 + \frac{2 \cdot \left(\frac{1}{3}\right) - 2}{3}$$

$$\frac{3 \cdot \frac{4}{3} - \frac{1}{3} + 4}{3} = 3 + \frac{\frac{2}{3} - 2}{3}$$






$$\frac{4 - \frac{1}{3} + 4}{3} = 3 + \frac{-\frac{4}{3}}{3}$$

$$\frac{11 - \frac{1}{3} + 4}{3} = 3 - \frac{4}{3} \cdot \frac{1}{3}$$

$$\frac{11 + 12}{9} = \frac{27 - 4}{9}$$

$$\frac{23}{9} = \frac{23}{9}$$

Keywords

-  *Algebra, equazioni, equazioni di primo grado, esercizi con soluzioni*
-  *Algebra, equation, linear equations, Algebraic Equations solved, exercises with solution*
-  *Algebra, ecuación, ecuaciones de primero grado*
-  *Algèbre, équations, système d'équations, équations en première*
-  *Algebra, reactievergelijking, Gleichung*

Arabic: مُعادلة

Chinese (Simplified): 反应式

Chinese (Traditional): 反應式

Czech: rovnice

Danish: regnestykke; ligning

Estonian: võrrand

Finnish: kaava

German: die Gleichung

Greek: εξίσωση (χημική αντίδραση)

Hungarian: egyenlet

Icelandic: efnajafna

Indonesian: persamaan

Japanese: 方程式

Korean: 반응식

Latvian: vienādojums

Lithuanian: formulė

Norwegian: likning

Polish: równanie, wzór

Portuguese: equação

Romanian: ecuație

Russian: формула реакции

Slovak: rovnica

Slovenian: enačba

Swedish: kemisk formel

Turkish: denklem