

Equazioni di primo grado con frazioni. Livello intermedio. Raccolta uno.

Completi di soluzione guidata. *First-Degree Equations**Résolution des équations du premier degré*

- | | | |
|-----|--|-----------------------------------|
| 1. | $\frac{x-1}{2} - \frac{x+1}{2} = x-1$ | [0]
soluzione |
| 2. | $x - \frac{x-1}{3} = -1 - \frac{x+2}{2}$ | [-3]
soluzione |
| 3. | $\frac{3x-2}{3} + \frac{3+x}{12} = \frac{3x+3}{4} - \frac{1}{6}$ | [3]
soluzione |
| 4. | $\frac{2-x}{2} + \frac{3-2x}{11} = \frac{x+1}{3} + 5$ | [-1]
soluzione |
| 5. | $\frac{5x-3}{2} + \frac{1}{5} = \frac{x-7}{2} - \frac{7-x}{5}$ | [-2]
soluzione |
| 6. | $\frac{1-2x}{2} + \frac{4-4x}{10} = \frac{2x-13}{10} - \frac{4x-3}{5}$ | [2]
soluzione |
| 7. | $\frac{5x-6}{4} + 1 - \frac{2x+1}{3} = x$ | [-2]
soluzione |
| 8. | $\frac{1}{6} \cdot (4+x) = 1 - \frac{1}{9} \cdot (1-2x)$ | [-4]
soluzione |
| 9. | $\frac{1+3x}{2} + \frac{1}{3} = \frac{x+6}{6} + \frac{x-2}{2}$ | [-1]
soluzione |
| 10. | $\frac{2x-3}{6} + \frac{21-x}{3} - \frac{5}{6} = \frac{21-x}{3} - \frac{x+1}{12}$ | [3]
soluzione |
| 11. | $4x - \frac{x+3}{4} - \frac{5 \cdot (x+1)}{3} = \frac{3 \cdot (x-2)}{2} - \frac{4 \cdot (x+1)}{3}$ | [-1]
soluzione |
| 12. | $\frac{x+1}{2} - \frac{3-x}{4} = 2 - \frac{1}{3}(6-x)$ | [3]
soluzione |
| 13. | $\frac{3 \cdot (2x+1)}{5} - \frac{3 \cdot (1+x)}{15} = 2 + \frac{15x-2}{20}$ | [6]
soluzione |
| 14. | $3 \cdot \left(\frac{5}{2} - \frac{x+16}{4} \right) - (x-2) - \frac{1}{4} = -\frac{2x+1}{4}$ | [-2]
soluzione |

15. $\frac{2x+1}{4} - (x-2) = -3 \cdot \left(\frac{5}{2} - \frac{x+16}{4} \right) + \frac{1}{4}$ [-2]
[soluzione](#)
16. $\frac{3 \cdot (2x-1)}{4} - \frac{5 \cdot (3x-5)}{3} = \frac{7-4x}{12} + \frac{2}{3}$ [2]
[soluzione](#)
17. $\frac{1}{3} \left(x - \frac{1}{2} \right) - \frac{1}{2} \left(x - \frac{1}{3} \right) = \frac{x-4}{2}$ [3] (*)
[soluzione](#)
18. $\frac{3x-1}{4} - \frac{1}{2} = \frac{2(2x+3)}{5} - \frac{x+3}{2}$ [1]
[soluzione](#)
19. $\frac{2x+3}{2} - \frac{3(x+2)}{4} = \frac{1}{3} - \frac{2-x}{3}$ [4]
[soluzione](#)
20. $\frac{2(x+3)}{15} = \frac{2x+1}{3} - \frac{x-2}{5}$ [-1]
[soluzione](#)
21. $\frac{x-7}{3} - \frac{2x-1}{15} - \frac{8}{15} = \frac{3x-1}{10} - \frac{x-1}{2}$ [8]
[soluzione](#)
22. $\frac{13x-2}{12} + \frac{2-3x}{10} - \frac{x+1}{5} = 1$ [2]
[soluzione](#)
23. $\frac{3x-9}{2} + 3x-3 = \frac{x+1}{4} + x+2$ [3]
[soluzione](#)
24. $\frac{3 \cdot (x+1) - x}{3} + 4x = 3 + \frac{2x-2}{3}$ $\left[\frac{1}{3} \right]$
[soluzione](#)
25. $\frac{x-2}{5} - \frac{2x+1}{3} + \frac{2x+6}{15} = 0$ [-1]
[soluzione](#)
26. $\frac{2(x+2)}{3} - \frac{3x-1}{2} = 1 + \frac{2(x-1)}{3}$ [1]
[soluzione](#)
27. $\frac{2(x-5)}{3} - \frac{2x+3}{5} = \frac{1}{3}x + \frac{2(-x-25)}{15}$ [9]
[soluzione](#)
28. $4 + \frac{1-x}{3} = x - \frac{x+3}{2}$ [2]
[soluzione](#)
29. $\frac{9-x}{2} + \frac{1}{20}x = \frac{29}{20} - \frac{x-5}{2} + \frac{x-1}{5}$ [5]
[soluzione](#)

30. $\frac{x+6}{2} + \frac{7}{6}x = \frac{2x+3}{3} - 3$ [-5]
[soluzione](#)

31. $x + \frac{x+2}{4} + \frac{1}{3}x = 3 + \frac{1}{3}x$ [2]
[soluzione](#)

32. $-\frac{x+6}{2} + \frac{1}{3}x = -\frac{2x+3}{3} + \frac{1}{2}$ [5]
[soluzione](#)

33. $\frac{1}{2}x - \frac{2(x+6)}{3} = -\frac{1}{3} - \frac{2x+3}{2} + x$ [-13]
[soluzione](#)

34. $\frac{2x-3}{4} + \frac{2x+3}{3} = 1 + \frac{5}{12}x$ [1]
[soluzione](#)

35. $\frac{3 \cdot (x-2)}{2} - \frac{4 \cdot (x+1)}{3} = 4x - \frac{x+3}{4} - \frac{5 \cdot (x+1)}{3}$ [-1]
[soluzione](#)

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

Soluzioni

Metodo 1	Metodo 2
$\frac{x-1}{2} - \frac{x+1}{2} = x-1$ Applico il 2° principio in modo da ottenere una equazione priva di frazioni $2 \cdot \frac{x-1}{2} - 2 \cdot \frac{x+1}{2} = 2 \cdot x - 2 \cdot 1$ $x-1-x-1=2x-2$ Elimino gli opposti e sommo i monomi simili $-2=2x-2$ $-2x=2-2$ $-2x=0$ $x=0$ NB sarebbe stato possibile anche elidere i due termini uguali a sinistra e destra del segno di uguaglianza	$\frac{x-1}{2} - \frac{x+1}{2} = x-1$ Trasformo l'equazione in una a termini frazionari $\frac{1}{2}x - \frac{1}{2} - \frac{1}{2}x - \frac{1}{2} = x-1$ Elimino gli opposti e sommo i monomi simili $\frac{-1-1}{2} = x-1$ $-1 = x-1$ $x-1 = -1$ $x = -1+1 = 0$ NB sarebbe stato possibile anche elidere i due termini uguali a sinistra e destra del segno di uguaglianza

Verifica

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

$$\frac{0-1}{2} - \frac{0+1}{2} = 0-1$$

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

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

$$-1 = -1$$

Metodo 1	Metodo 2
$x - \frac{x-1}{3} = -1 - \frac{x+2}{2}$ Applico il 2° principio in modo da ottenere una equazione priva di frazioni $6 \cdot x - 6 \cdot \frac{x-1}{3} = 6 \cdot (-1) - 6 \cdot \frac{x+2}{2}$ $6x - 2(x-1) = -6 - 3(x+2)$ $6x - 2x + 2 = -6 - 3x - 6$ Sommo i monomi simili $4x + 2 = -3x - 12$ Applico la regola del trasporto $4x + 3x = -2 - 12$ $7x = -14$ $x = -\frac{14}{7} = -2$	$x - \frac{x-1}{3} = -1 - \frac{x+2}{2}$ Trasformo l'equazione in una a termini frazionari $x - \frac{1}{3}x + \frac{1}{3} = -1 - \frac{1}{2}x - \frac{2}{2}$ Applico la regola del trasporto $x - \frac{1}{3}x + \frac{1}{2}x = -1 - 1 - \frac{1}{3}$ Sommo i monomi simili $\frac{6-2+3}{6}x = \frac{-3-3-1}{3}$ $\frac{7}{6}x = -\frac{7}{3}$ $x = -\frac{7}{3} \cdot \frac{6}{7} = -\frac{6}{3} = -2$

Verifica

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

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

$$-2 + \frac{3}{3} = -1 - \frac{0}{2}$$

$$-2 + 1 = -1$$

$$-1 = -1$$

Metodo 1	Metodo 2
$\frac{3x-2}{3} + \frac{3+x}{12} = \frac{3x+3}{4} - \frac{1}{6}$ Trasformo l'equazione in una a termini frazionari $x - \frac{2}{3} + \frac{3}{12} + \frac{1}{12}x = \frac{3}{4}x + \frac{3}{4} - \frac{1}{6}$ $x + \frac{1}{12}x - \frac{3}{4}x = +\frac{3}{4} - \frac{1}{6} + \frac{2}{3} - \frac{3}{12}$ $\frac{12+1-9}{12}x = \frac{9-2+8-3}{12}$ $\frac{4}{12}x = \frac{12}{12}$ $x = \frac{12}{12} \cdot \frac{12}{4}$ $x = 3$	$\frac{3x-2}{3} + \frac{3+x}{12} = \frac{3x+3}{4} - \frac{1}{6}$ Applico il 2° principio in modo da ottenere una equazione priva di frazioni $12 \cdot \frac{3x-2}{3} + 12 \cdot \frac{3+x}{12} = 12 \cdot \frac{3x+3}{4} - 12 \cdot \frac{1}{6}$ $4 \cdot (3x-2) + 3+x = 3 \cdot (3x+3) - 2$ $12x - 8 + 3 + x = 9x + 9 - 2$ $12x + x - 9x = 9 - 2 + 8 - 3$ $4x = 12$ $x = \frac{12}{4} = 3$

Verifica

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

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

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

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

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

Metodo 1	Metodo 2
$\frac{2-x}{2} + \frac{3-2x}{11} = \frac{x+1}{3} + 5$ $\frac{33 \cdot (2-x) + 6 \cdot (3-2x) = 22 \cdot (x+1) + 66 \cdot 5}{66}$ $66 - 33x + 18 - 12x = 22x + 22 + 330$ $-33x - 12x - 22x = +22 + 330 - 66 - 18$ $-45x - 22x = +352 - 84$ $-67x = 268$ $x = \frac{268}{-67} = -4$	$\frac{2-x}{2} + \frac{3-2x}{11} = \frac{x+1}{3} + 5$ $1 - \frac{1}{2}x + \frac{3}{11} - \frac{2}{11}x = \frac{1}{3}x + \frac{1}{3} + 5$ $-\frac{1}{2}x - \frac{2}{11}x - \frac{1}{3}x = \frac{1}{3} + 5 - \frac{3}{11} - 1$ $\frac{-33 - 12 - 22}{66}x = \frac{22 + 330 - 18 - 66}{66}$ $-\frac{67}{66}x = \frac{268}{66}$ $x = \frac{268}{66} \cdot \left(-\frac{66}{67}\right) = -4$

Verifica

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

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

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

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

$$4 = 4$$

$$\begin{aligned}\frac{5x-3}{2} + \frac{1}{5} &= \frac{x-7}{2} - \frac{7-x}{5} \\ 10 \cdot \frac{25x-15+2}{10} &= \frac{5x-35-14+2x}{10} \cdot 10 \\ 25x-15+2 &= 5x-35-14+2x \\ 25x-5x-2x &= -35-14+15-2 \\ 20x-2x &= -35+1-2 \\ \frac{18}{18}x &= -\frac{36}{18}x \\ x &= -2\end{aligned}$$

$$\begin{aligned}\frac{5 \cdot (-2) - 3}{2} + \frac{1}{5} &= \frac{(-2) - 7}{2} - \frac{7 - (-2)}{5} \\ \frac{-10-3}{2} + \frac{1}{5} &= -\frac{9}{2} - \frac{7+2}{5} \\ -\frac{13}{2} + \frac{1}{5} &= -\frac{9}{2} - \frac{9}{5} \\ \frac{-65+2}{10} &= \frac{-45-18}{10} \\ -\frac{63}{10} &= -\frac{63}{10}\end{aligned}$$

$$\begin{aligned}\frac{1-2x}{2} + \frac{4-4x}{10} &= \frac{2x-13}{10} - \frac{4x-3}{5} \\ 5-10x+4-4x &= 2x-13-8x+6 \\ -10x-4x-2x+8x &= -13+6-5-4 \\ 8x-16x &= 6-22 \\ -8x &= -16 \\ 8x &= 16 \\ x &= \frac{16}{8} = 2\end{aligned}$$

$$\begin{aligned}\frac{1-4}{2} + \frac{4-8}{10} &= \frac{4-13}{10} - \frac{8-3}{5} \\ -\frac{3}{2} - \frac{4}{10} &= -\frac{9}{10} - \frac{5}{5} \\ \frac{-15-4}{10} &= \frac{-9-10}{10} \\ -\frac{19}{10} &= -\frac{19}{10}\end{aligned}$$

Verificata

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

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

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

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

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

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

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

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

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

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

$$-2 = -2$$

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

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

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

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

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

$$-x = 4$$

$$x = -4$$

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

$$0 = 1 - 1$$

$$0 = 0$$

$$\begin{aligned}\frac{1+3x}{2} + \frac{1}{3} &= \frac{x+6}{6} + \frac{x-2}{2} \\ 6 \cdot \frac{1+3x}{2} + 6 \cdot \frac{1}{3} &= 6 \cdot \frac{x+6}{6} + 6 \cdot \frac{x-2}{2} \\ 3 \cdot (1+3x) + 2 &= x+6 + 3 \cdot (x-2) \\ 3+9x+2 &= x+6+3x-6 \\ 9x-x-3x &= -3-2 \\ 5x &= -5 \\ x &= -1\end{aligned}$$

$$\begin{aligned}\frac{1+3 \cdot (-1)}{2} + \frac{1}{3} &= \frac{-1+6}{6} + \frac{-1-2}{2} \\ \frac{1-3}{2} + \frac{1}{3} &= \frac{5}{6} - \frac{3}{2} \\ -\frac{2}{2} + \frac{1}{3} &= \frac{5-9}{6} \\ \frac{-3+1}{3} &= \frac{5-9}{6} \\ -\frac{2}{3} &= -\frac{2^2}{6_3}\end{aligned}$$

$$\begin{aligned}\frac{2x-3}{6} + \frac{21-x}{3} - \frac{5}{6} &= \frac{21-x}{3} - \frac{x+1}{12} \\ 2(2x-3) - 2(5) &= -(x+1) \\ 4x-6-10 &= -x-1 \\ 4x+x &= -1+6+10 \\ 5x &= 15 \\ x = \frac{15}{5} &= 3\end{aligned}$$

$$\begin{aligned}\frac{(6-3)}{6} + \frac{21-3}{3} - \frac{5}{6} &= \frac{21-3}{3} - \frac{3+1}{12} \\ \frac{3}{6} + \frac{18}{3} - \frac{5}{6} &= \frac{18}{3} - \frac{4}{12} \\ \frac{3}{6} + 6 - \frac{5}{6} &= \frac{72-4}{12} \\ \frac{3+36-5}{6} &= \frac{68}{12} \\ \frac{34}{6} &= \frac{68}{12} \\ \frac{34}{6} &= \frac{34}{6}\end{aligned}$$

Verificata

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

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

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

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

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

$$23x = -23$$

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

Verifica

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

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

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

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

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

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

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

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

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

$$9x - 8x = 3$$

$$x = 3$$

Verifica

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

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

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

$$2 = 2$$

verificata

$$\frac{3 \cdot (2x+1)}{5} - \frac{3 \cdot (1+x)}{15} = 2 + \frac{15x-2}{20}$$

$$60 \frac{3(2x+1)}{5} - 60 \frac{3(1+x)}{15} = 60 \cdot 2 + 60 \frac{15x-2}{20}$$

$$12 \frac{3(2x+1)}{1} - 4 \frac{3(1+x)}{1} = 120 + 3 \frac{15x-2}{1}$$

$$36(2x+1) - 12(1+x) = 120 + 3(15x-2)$$

$$72x + 36 - 12 - 12x = 120 + 45x - 6$$

$$72x - 12x - 45x = 120 - 6 - 36 + 12$$

$$60x - 45x = 120 - 30$$

$$15x = 90$$

$$x = 90/15 = 6$$

$$\frac{3 \cdot (2x+1)}{5} - \frac{3 \cdot (1+x)}{15} = 2 + \frac{15x-2}{20}$$

$$\frac{3 \cdot (2 \cdot 6 + 1)}{5} - \frac{3 \cdot (1 + 6)}{15} = 2 + \frac{15 \cdot 6 - 2}{20}$$

$$\frac{3 \cdot (13)}{5} - \frac{3 \cdot (7)}{15} = 2 + \frac{90 - 2}{20}$$

$$\frac{39}{5} - \frac{21}{15} = 2 + \frac{88}{20}$$

$$\frac{117 - 21}{15} = \frac{40 + 88}{20}$$

$$\frac{96}{15} = \frac{128}{20}$$

$$\frac{32}{5} = \frac{32}{5}$$

Oppure

$$\frac{6x+3}{5} - \frac{3+3x}{15} = 2 + \frac{15}{20}x - \frac{2}{20}$$

$$\frac{6}{5}x + \frac{3}{5} - \frac{3}{15} - \frac{3}{15}x = 2 + \frac{15}{20}x - \frac{2}{20}$$

$$\frac{6}{5}x - \frac{3}{15}x - \frac{15}{20}x = 2 - \frac{2}{20} - \frac{3}{5} + \frac{3}{15}$$

$$\frac{6}{5}x - \frac{1}{5}x - \frac{3}{4}x = 2 - \frac{1}{10} - \frac{3}{5} + \frac{1}{5}$$

$$\frac{24-4-15}{20}x = \frac{20-1-6+2}{10}$$

$$\frac{5}{20}x = \frac{15}{10}$$

$$x = \frac{15}{10} \frac{20}{5} = \frac{3 \cdot 2}{1} = 6$$

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

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

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

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

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

$$-5x = 10$$

$$x = -2$$

Verifica

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

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

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

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

Per disegnare la retta corrispondente

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

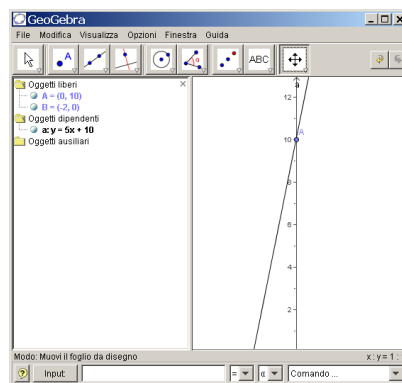
$$30 - 3x - 48 - 4x + 8 - 1 = -2x - 1$$

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

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

$$0 = 5x + 10$$

$$y = 5x + 10$$



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

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

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

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

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

$$-5x = 10$$

$$x = -2$$

Verifica

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

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

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

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

Per disegnare la retta corrispondente

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

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

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

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

$$0 = 5x+10$$

$$y = 5x+10$$

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

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

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

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

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

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

$$-38x = -76$$

$$38x = 76$$

$$x = 76/38 = 2$$

Verifica

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

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

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

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

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

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

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

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

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

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

$$-4x = -12$$

$$4x = 12$$

$$x = 3$$

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

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

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

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

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

$$20 \cdot \frac{x+3}{2} - 20 \cdot \frac{1}{2} = 20 \cdot \frac{2(2x+3)}{5} - 20 \cdot \frac{3x-1}{4}$$

$$10x + 30 - 10 = 16x + 24 - 15x + 5$$

$$10x + 20 = x + 29$$

$$10x - x = 29 - 20$$

$$9x = 9$$

$$x = 1$$

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

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

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

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

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

$$\frac{3}{2} = \frac{3}{2}$$

$$\begin{aligned}\frac{2x+3}{2} - \frac{3(x+2)}{4} &= \frac{1}{3} - \frac{2-x}{3} \\ \frac{6(2x+3) - 9(x+2)}{12} &= \frac{4 - 4(2-x)}{12} \\ 12x + 18 - 9x - 18 &= 4 - 8 + 4x \\ 12x - 9x - 4x &= 4 - 8 \\ -x &= -4 \\ x &= 4\end{aligned}$$

$$\begin{aligned}\frac{2 \cdot 4 + 3}{2} - \frac{3(4+2)}{4} &= \frac{1}{3} - \frac{2-4}{3} \\ \frac{8+3}{2} - \frac{3 \cdot 6}{4} &= \frac{1}{3} - \frac{-2}{3} \\ \frac{11}{2} - \frac{18}{4} &= \frac{1}{3} + \frac{2}{3} \\ \frac{11}{2} - \frac{9}{2} &= \frac{3}{3} \\ \frac{2}{2} &= 1 \\ 1 &= 1\end{aligned}$$

$$\begin{aligned}\frac{2(x+3)}{15} &= \frac{2x+1}{3} - \frac{x-2}{5} \\ \frac{2(x+3)}{15} &= \frac{5(2x+1) - 3(x-2)}{15} \\ 2x + 6 &= 10x + 5 - 3x + 6 \\ 2x - 10x + 3x &= 5 + 6 - 6 \\ -5x &= 5 \\ x = \frac{5}{-5} &= -1\end{aligned}$$

Verifica

$$\begin{aligned}\frac{2(-1+3)}{15} &= \frac{2(-1)+1}{3} - \frac{-1-2}{5} \\ \frac{2 \cdot 2}{15} &= \frac{-2+1}{3} - \frac{-3}{5} \\ \frac{4}{15} &= -\frac{1}{3} + \frac{3}{5} = \\ \frac{4}{15} &= \frac{-5+9}{15} = \\ \frac{4}{15} &= \frac{4}{15}\end{aligned}$$

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

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

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

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

$$12x = 96$$

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

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

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

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

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

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

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

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

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

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

$$35x = 70$$

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

Verifica

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

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

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

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

$$2 - 1 = 1$$

$$1 = 1$$

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

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

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

$$13x = 39$$

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

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

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

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

$$6 = 6$$

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

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

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

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

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

$$12x = 4$$

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

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

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

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

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

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

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

$$\frac{x-2}{5} - \frac{2x+1}{3} + \frac{2x+6}{15} = 0$$

$$\frac{x}{5} - \frac{2}{5} - \frac{2x}{3} - \frac{1}{3} + \frac{2x}{15} + \frac{6}{15} = 0$$

$$\frac{x}{5} - \frac{2x}{3} + \frac{2x}{15} = +\frac{2}{5} + \frac{1}{3} - \frac{6}{15}$$

$$\frac{3x-10x+2x}{15} \cdot 15 = \frac{6+5-6}{15} \cdot 15$$

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

$$-5x = 5$$

$$5x = -5$$

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

$$\frac{(-1)-2}{5} - \frac{2 \cdot (-1)+1}{3} + \frac{2 \cdot (-1)+6}{15} = 0$$

$$-\frac{3}{5} - \frac{-1}{3} + \frac{4}{15} = 0$$

$$-\frac{3}{5} + \frac{1}{3} + \frac{4}{15} = 0$$

$$\frac{-9+5+4}{5} = 0$$

$$\frac{0}{15} = 0$$

$$0 = 0$$

2° modo

$$\frac{3(x-2) - 5(2x+1) + 2x+6}{15} = 0$$

$$3x-6-10x-5+2x+6=0$$

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

$$-5x=5$$

$$5x=-5$$

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

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

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

$$4x + 8 + 3 = 6 + 4x - 4$$

$$4x + 11 = 2 + 4x$$

$$-9x = 2 - 11$$

$$-9x = -9$$

$$9x = 9$$

$$x = 1$$

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

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

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

$$\frac{14}{3} \cdot \frac{1}{3} = 1 + \left(-\frac{4}{3}\right) \cdot \frac{1}{3}$$

$$\frac{14}{9} = 1 - \frac{4}{9}$$

$$\frac{2(x-5)}{3} - \frac{2x+3}{5} = \frac{1}{3}x + \frac{2(-x-25)}{15}$$

$$\frac{10(x-5) - 3(2x+3)}{15} = \frac{5x + 2(-x-25)}{15}$$

$$10x - 50 - 6x - 9 = 5x - 2x - 50$$

$$4x - 9 = 3x$$

$$4x - 3x = 9$$

$$x = 9$$

$$\frac{2 \cdot (9-5)}{3} - \frac{2 \cdot 9 + 3}{5} = \frac{1}{3} \cdot 9 + \frac{2 \cdot (-9-25)}{15}$$

$$\frac{2 \cdot 4}{3} - \frac{18+3}{5} = 3 + \frac{2 \cdot (-34)}{15}$$

$$\frac{8}{3} - \frac{21}{5} = 3 - \frac{68}{15}$$

$$\frac{40-63}{15} = \frac{45-68}{15}$$

$$-\frac{23}{15} = -\frac{23}{15}$$

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

$$\frac{24 + 2(1-x)}{6} = \frac{6x - 3(x+3)}{6}$$

$$24 + 2 - 2x = 6x - 3x - 9$$

$$26 - 2x = 3x - 9$$

$$-2x - 3x = -9 - 26$$

$$-5x = -35$$

$$5x = 35$$

$$x = \frac{35}{5} = 7$$

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

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

$$4 - 2 = 7 - 5$$

$$2 = 2$$

$$\frac{9-x}{2} + \frac{1}{20}x = \frac{29}{20} - \frac{x-5}{2} + \frac{x-1}{5}$$

$$\frac{10(9-x) + x}{20} = \frac{29 - 10(x-5) + 4(x-1)}{20}$$

$$90 - 10x + x = 29 - 10x + 50 + 4x - 4$$

$$90 + x = 29 + 50 + 4x - 4$$

$$x - 4x = 79 - 4 - 90$$

$$-3x = -15$$

$$3x = 15$$

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

$$\frac{9-5}{2} + \frac{1}{20} \cdot 5 = \frac{29}{20} - \frac{5-5}{2} + \frac{5-1}{5}$$

$$\frac{4}{2} + \frac{1}{4} = \frac{29}{20} + \frac{4}{5}$$

$$2 + \frac{1}{4} = \frac{29+16}{20}$$

$$\frac{9}{4} = \frac{45}{20}$$

$$\frac{9}{4} = \frac{9}{4}$$

$$\frac{x+6}{2} + \frac{7}{6}x = \frac{2x+3}{3} - 3$$

$$\frac{3(x+6) + 7x}{6} = \frac{2(2x+3) - 6 \cdot 3}{6}$$

$$3x + 18 + 7x = 4x + 6 - 18$$

$$3x + 7x - 4x = 6 - 18 - 18$$

$$6x = -30$$

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

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

$$\frac{1}{2} - \frac{35}{6} = -\frac{7}{3} - 3$$

$$\frac{3-35}{6} = \frac{-7-9}{3}$$

$$-\frac{32}{6} = -\frac{16}{3}$$

$$-\frac{16}{3} = -\frac{16}{3}$$

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

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

$$\frac{4x + x + 2}{4} = \frac{4 \cdot 3}{4}$$

$$4x + x + 2 = 12$$

$$5x = 12 - 2$$

$$5x = 10$$

$$x = \frac{10}{5} = 2$$

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

$$2 + 1 + \frac{2}{3} = 3 + \frac{2}{3}$$

$$3 + \frac{2}{3} = 3 + \frac{2}{3}$$

$$\begin{aligned}
-\frac{x+6}{2} + \frac{1}{3}x &= -\frac{2x+3}{3} + \frac{1}{2} \\
\frac{-3(x+6) + 2x}{6} &= \frac{-2(2x+3) + 3}{6} \\
-3x - 18 + 2x &= -4x - 6 + 3 \\
-3x + 2x + 4x &= -3 + 18 \\
3x &= +15 \\
x &= 5
\end{aligned}$$

$$\begin{aligned}
-\frac{5+6}{2} + \frac{1}{3} \cdot (5) &= -\frac{2 \cdot (5) + 3}{3} + \frac{1}{2} \\
-\frac{11}{2} + \frac{5}{3} &= -\frac{13}{3} + \frac{1}{2} \\
\frac{-33 + 10}{6} &= \frac{-26 + 3}{6} \\
-\frac{23}{6} &= -\frac{23}{6}
\end{aligned}$$

$$\begin{aligned}
\frac{1}{2}x - \frac{2(x+6)}{3} &= -\frac{1}{3} - \frac{2x+3}{2} + x \\
\frac{3x - 4(x+6)}{6} &= \frac{-2 - 3(2x+3) + 6x}{6} \\
3x - 4x - 24 &= -2 - 6x - 9 + 6x \\
3x - 4x &= -2 - 9 + 24 \\
-x &= +13 \\
x &= -13
\end{aligned}$$

$$\begin{aligned}
-\frac{13}{2} - \frac{2(-7)}{3} &= -\frac{1}{3} - \frac{-26+3}{2} - 13 \\
-\frac{13}{2} + \frac{14}{3} &= -\frac{1}{3} + \frac{23}{2} - 13 \\
\frac{-39 + 28}{6} &= \frac{-2 + 69 - 78}{6} \\
-\frac{11}{6} &= -\frac{11}{6}
\end{aligned}$$

$$\begin{aligned}
\frac{2x-3}{4} + \frac{2x+3}{3} &= 1 + \frac{5}{12}x \\
\frac{3(2x-3) + 4(2x+3)}{12} &= \frac{12+5x}{12} \\
6x - 9 + 8x + 12 &= 12 + 5x \\
6x + 8x - 5x &= 9 \\
9x &= 9 \\
x &= 1
\end{aligned}$$

$$\begin{aligned}
\frac{2-3}{4} + \frac{2+3}{3} &= 1 + \frac{5}{12} \\
-\frac{1}{4} + \frac{5}{3} &= \frac{12+5}{12} \\
\frac{-3+20}{12} &= \frac{17}{12} \\
\frac{17}{12} &= \frac{17}{12}
\end{aligned}$$

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

$$18 \cdot (x-2) - 16 \cdot (x+1) = 12 \cdot 4x - 3 \cdot (x+3) - 20 \cdot (x+1)$$

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

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

$$2x - 48x + 3x + 20x = -29 + 36 + 16$$

$$-46x + 3x + 20x = 7 + 16$$

$$-43x + 20x = 23$$

$$-23x = 23$$

$$23x = -23$$

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

$$x = -1$$

Verifica

$$\frac{3 \cdot (-3)}{2} - \frac{4 \cdot 0}{3} = -4 - \frac{2}{4} - \frac{5 \cdot 0}{3}$$

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

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

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