

Variablen und Gleichungen - Aufgabensammlung

Rahal Learning

unkompliziert und verlässlich



Hier findest du einige Rechenaufgaben die dir helfen zu überprüfen ob du das Thema Bruchrechnen beherrschst. Auf unserer Webseite [Rahal-Teaching.ch/downloads](https://www.rahall-teaching.ch/downloads) findest du die Lösungen und einige vorgerechnete Beispiele. Viel Spass beim lösen!

Löse nach x auf (Am Ende sollte x alleine auf einer Seite des Gleichs stehen):

1. $x + 1 = 3$

$$\begin{aligned} x + 1 &= 3 & | -1 \\ x &= 2 \end{aligned}$$

2. $x - 4 = 9$

$$\begin{aligned} x - 4 &= 9 & | +4 \\ x &= 13 \end{aligned}$$

3. $2x = 4$

$$\begin{aligned} 2x &= 4 & | \div 2 \\ x &= 2 \end{aligned}$$

4. $5 - x = 3$

$$\begin{aligned} 5 - x &= 3 & | +x \\ 5 &= 3 + x & | -3 \\ 2 &= x \end{aligned}$$

5. $2x + 2 = 4$

$$\begin{aligned} 2x + 2 &= 4 & | -2 \\ 2x &= 2 & | \div 2 \\ x &= 1 \end{aligned}$$

6. $4 - 2x = 2$

$$\begin{aligned} 4 - 2x &= 2 & | +2x \\ 4 &= 2 + 2x & | -2 \\ 2 &= 2x & | \div 2 \\ 1 &= x \end{aligned}$$

7. $3x = 2$

$$\begin{aligned} 3x &= 2 & | \div 3 \\ x &= \frac{2}{3} \end{aligned}$$

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

$$\begin{aligned} \frac{x}{2} &= 2 & | \times 2 \\ x &= 4 \end{aligned}$$

9. $\frac{x}{4} + 4 = \frac{1}{4}$

$$\begin{aligned} \frac{x}{4} + 4 &= \frac{1}{4} & | \times 4 \\ x + 16 &= 1 & | -16 \\ x &= -15 \end{aligned}$$

10. $2(x + 1) = 4$

$$\begin{aligned} 2x + 2 &= 4 & | -2 \\ 2x &= 2 & | \div 2 \\ x &= 1 \end{aligned}$$

11. $2(x - 1) = 0$

$$\begin{aligned} 2x - 2 &= 0 & | +2 \\ 2x &= 2 & | \div 2 \\ x &= 1 \end{aligned}$$

12. $3(2 - x) = -9$

$$\begin{aligned} 6 - 3x &= -9 & | +3x \\ 6 &= 3x - 9 & | +9 \\ 15 &= 3x & | \div 3 \\ 5 &= x \end{aligned}$$

13. $x^2 = 9$

$$\begin{aligned} x^2 &= 9 & | \sqrt{} \\ x &= \pm 3 \end{aligned}$$

$\pm$ steht, weil $(-3)^2$ und 3^2 beide 9 ergeben

14. $\sqrt{x} = 2$

$$\begin{aligned} \sqrt{x} &= 2 & | ()^2 \\ x &= 4 \end{aligned}$$

15. $x^2 = \sqrt{16}$

$$\begin{aligned} x^2 &= 4 & | \sqrt{} \\ x &= \pm 2 \end{aligned}$$

16. $x(x + 1) = x^2 + 4$

$$\begin{aligned} x^2 + x &= x^2 + 4 & | -x^2 \\ x &= 4 \end{aligned}$$

17. $(x - 2)(x + 1) = x^2 + 4$

$$\begin{aligned} x^2 + x - 2x - 2 &= x^2 + 4 & | -x^2 \\ -x - 2 &= 4 & | +2 \\ -x &= 6 & | \times (-1) \\ x &= -6 \end{aligned}$$

18. $x^3 = 4x$

$$\begin{aligned} x^3 &= 4x & | \div x \\ x^2 &= 4 & | \sqrt{} \\ x &= \pm 2 \end{aligned}$$

19. $(x + 3)^2 = x^2 + 3$

$$\begin{aligned} (x + 3)(x + 3) &= x^2 + 3 \\ x^2 + 6x + 9 &= x^2 + 3 & | -x^2 \\ 6x + 9 &= 3 & | -9 \\ 6x &= -6 & | \div 6 \\ x &= -1 \end{aligned}$$

20. $\frac{x}{3} = \frac{6}{2}$

$$\begin{aligned} \frac{x}{3} &= 3 & | \times 3 \\ x &= 9 \end{aligned}$$

21. $\frac{x + 2}{5} = 3$

$$\begin{aligned} \frac{x + 2}{5} &= 3 & | \times 5 \\ x + 2 &= 15 & | -2 \\ x &= 13 \end{aligned}$$

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$$22. \frac{x}{3} - \frac{2}{7} = 0$$

$$\begin{aligned} \frac{x}{3} - \frac{2}{7} &= 0 \quad | + \frac{2}{7} \\ \frac{x}{3} &= \frac{2}{7} \quad | \times 3 \\ x &= \frac{6}{7} \quad | \times 7 \\ 7x &= 6 \quad | \div 7 \\ x &= \frac{6}{7} \end{aligned}$$

$$23. \frac{2}{3} \div \frac{1}{3x} = 1$$

$$\begin{aligned} \frac{2}{3} \times \frac{3x}{1} &= 1 \\ \frac{6x}{3} &= 1 \quad | \times 3 \\ 6x &= 3 \quad | \div 6 \\ x &= \frac{3}{6} \\ x &= \frac{1}{2} \end{aligned}$$

$$24. \frac{4}{x} = 2$$

$$\begin{aligned} \frac{4}{x} &= 2 \quad | \times x \\ 4 &= 2x \quad | \div 2 \\ 2 &= x \end{aligned}$$

$$25. \begin{cases} x + y = 2 & \text{I.} \\ y = 1 & \text{II.} \end{cases}$$

$$\begin{aligned} \text{I.} - \text{II.} &\rightarrow x + y - y = 2 - 1 \\ x &= 1, \quad y = 1 \end{aligned}$$

$$26. \begin{cases} x + 2y = 2 & \text{I.} \\ 4y = 8 & \text{II.} \end{cases}$$

$$\begin{aligned} \text{II.} \div 2 &\rightarrow 2y = 4 \quad \text{I.} - \text{II.} \div 2 \rightarrow x + 2y - 2y = 2 - 4 \rightarrow x = -2 \\ \text{II.} \div 4 &\rightarrow y = 2 \end{aligned}$$

$$27. \begin{cases} x + y = 4 & \text{I.} \\ y = 4 & \text{II.} \end{cases}$$

$$\text{I.} - \text{II.} \rightarrow x + y - y = 4 - 4 \rightarrow x = 0, y = 4$$

$$28. \begin{cases} x + y = 3 & \text{I.} \\ x - y = 1 & \text{II.} \end{cases}$$

$$\begin{aligned} \text{I.} + \text{II.} &\rightarrow x + y + x - y = 3 + 1 \rightarrow 2x = 4 \quad | \div 2 \rightarrow x = 2 \\ x \text{ in I. eingesetzt} &\rightarrow 2 + y = 3 \quad | - 2 \rightarrow y = 1 \end{aligned}$$

$$29. \begin{cases} 2x + y = -1 & \text{I.} \\ x + 2y = 1 & \text{II.} \end{cases}$$

$$\begin{aligned} 2 \times \text{I.} - \text{II.} &\rightarrow 4x + 2y - x - 2y = -2 - 1 \rightarrow 3x = -3 \quad | \div 3 \\ x &= -1 \xrightarrow{\text{in I.}} -2 + y = -1 \quad | + 2 \rightarrow y = 1 \end{aligned}$$

$$30. \begin{cases} y - x = 2 & \text{I.} \\ 2x = 4 & \text{II.} \end{cases}$$

$$\begin{aligned} 2 \times \text{I.} + \text{II.} &= 2y - 2x + 2x = 4 + 4 \\ 2y &= 8 \quad | \div 2 \rightarrow y = 4, \quad \text{II.} \div 2 \rightarrow x = 2 \end{aligned}$$