

2. Radizieren, Quadrieren von Gleichungen

2.1. Radizieren von Gleichungen

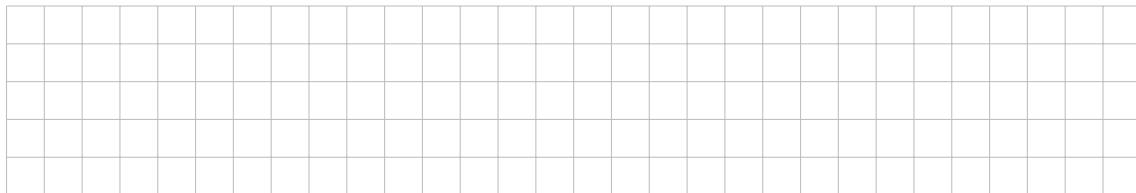
1. Beispiele

a) Löse die Gleichung $x^2 = 25$.

b) Ebenso: $(x - 5)^2 = 4$



2. Rechenregel



In Zeichen: $x^2 = y^2 \Rightarrow \begin{cases} x = y \\ x = -y \end{cases}$

Man setzt *ein* Vorzeichen, egal auf welcher Seite der Gleichung.

3. Übungen

a) $(x - 3)^2 = 16$

b) $(2x - 1)^2 = (x + 3)^2$

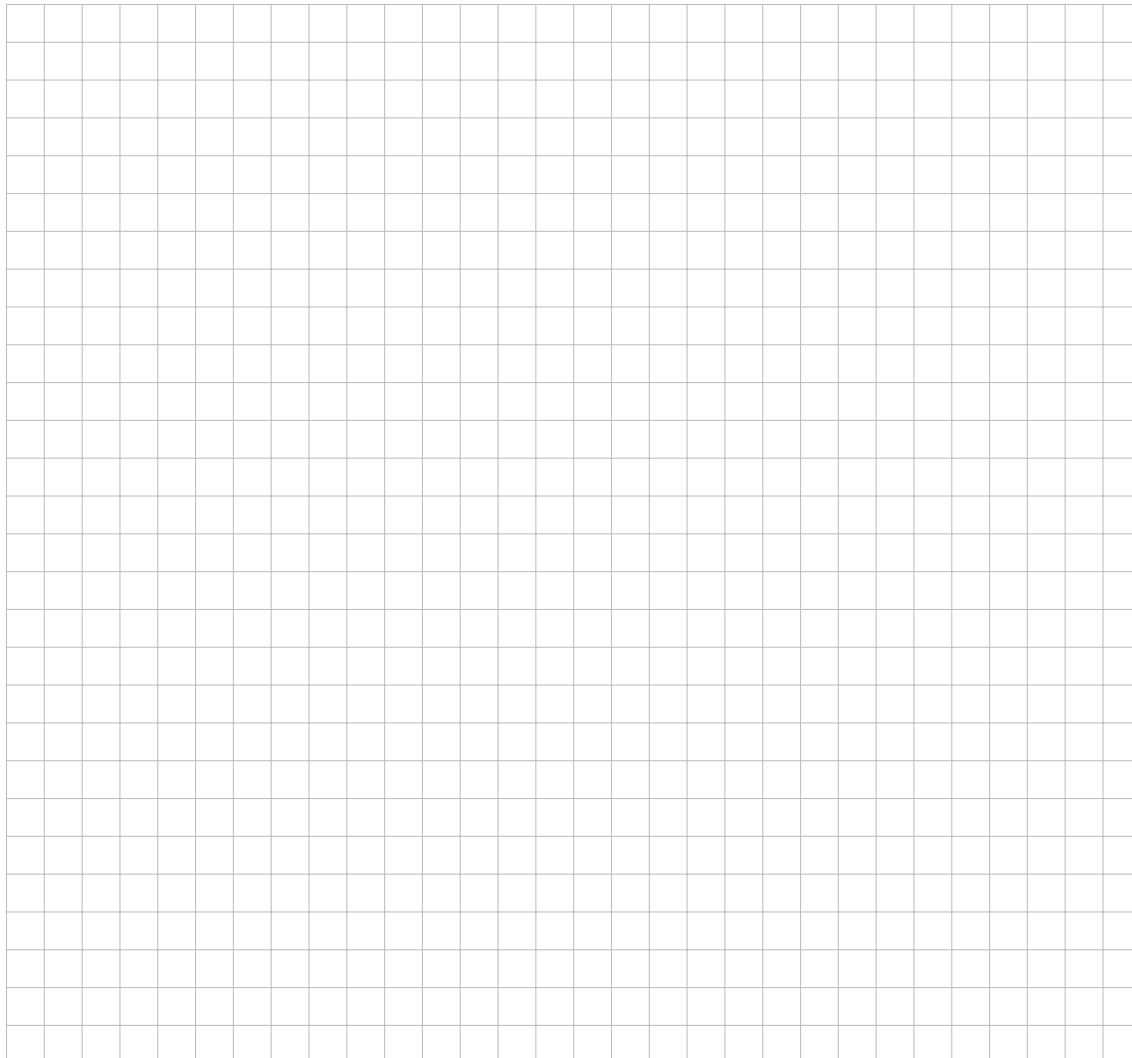
c) $(x + 5)^2 = (x - 3)^2$



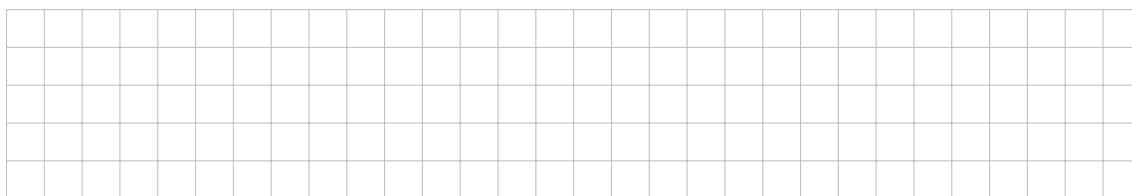
2.2. Quadrieren von Gleichungen

1. Musterbeispiele

- a) $\sqrt{x+5} = 4$
- b) $\sqrt{x^2 + 5} = x + 1$
- c) $3 \cdot \sqrt{x+5} = \sqrt{x+11}$
- d) $4 + 9 \cdot \sqrt{x^2 + 9} = 49$
- e) $\sqrt{1-x} = \sqrt{x-11}$

A large grid of squares, approximately 20 columns by 30 rows, intended for students to work out their solutions to the exercises.

2. Rechenregel

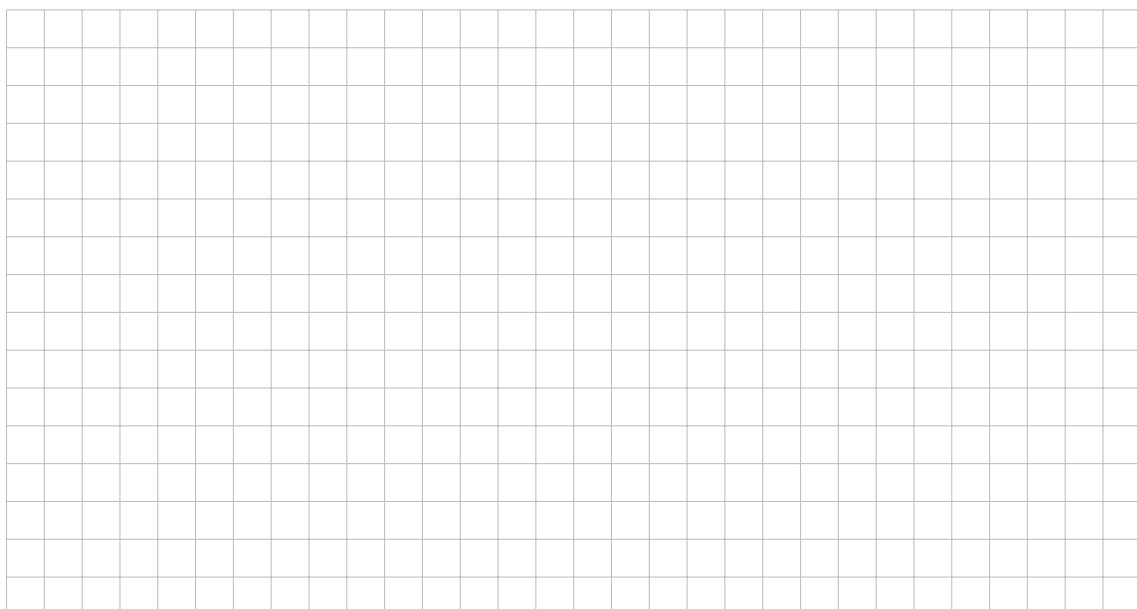
A large grid of squares, approximately 20 columns by 30 rows, intended for students to work out their solutions to the exercises.

3. Scheinlösungen, 1. Teil

- a) $\sqrt{5-x} = \sqrt{2x-4}$
- b) $\sqrt{5-x} = \sqrt{2x+14}$
- c) $\sqrt{5-x} = \sqrt{13-2x}$
- d) $\sqrt{5-x} = \sqrt{10-2x}$

A large grid of squares, approximately 10 columns by 20 rows, intended for students to show their work for the first part of the exercise.**4. Scheinlösungen, 2. Teil**

- a) $\sqrt{x} + 2 = 0$
- b) $\sqrt{x^2 - 5} = x - 1$
- c) $\sqrt{x^2 + 3} = x - 3$
- d) $\sqrt{x} = x - 6$

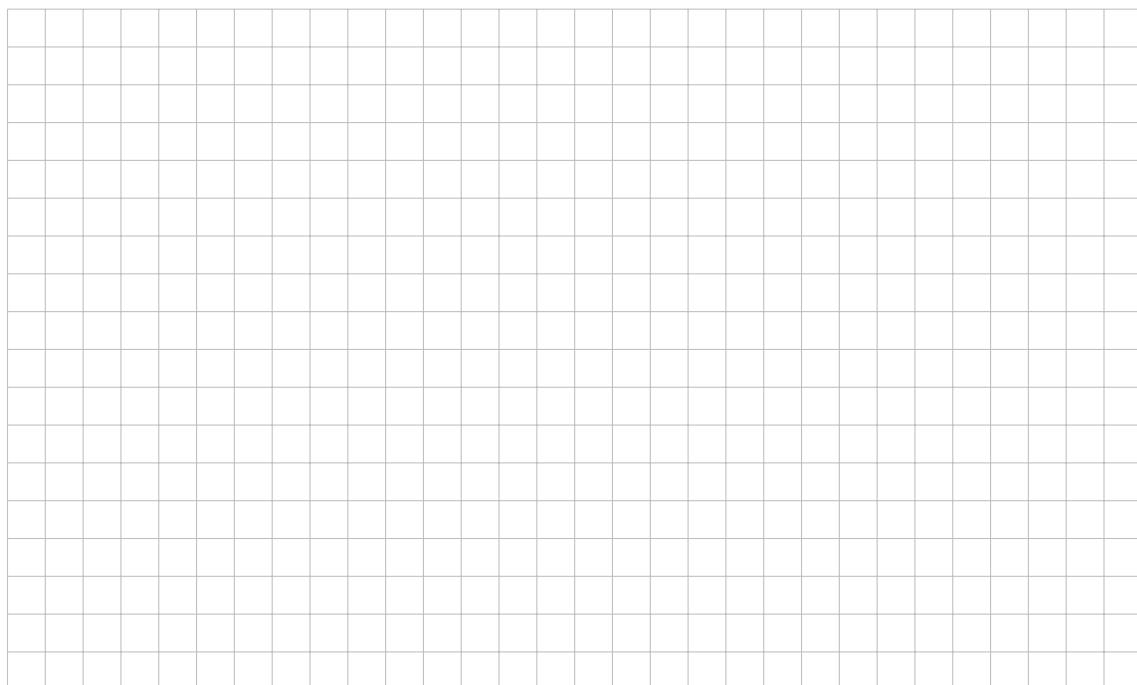
A large grid of squares, approximately 10 columns by 20 rows, intended for students to show their work for the second part of the exercise.

5. Übungen

- a) $\sqrt{3x} = \sqrt{x+3}$
- b) $\sqrt{2x+7} = \sqrt{5} + \sqrt{2}$
- c) $x - 4 = \sqrt{x \cdot (5x-8)}$

**6. Sonderfälle**

- a) $\sqrt{5-x} = \sqrt{12-x}$
- b) $\sqrt{5-x} = \sqrt{12-(x+7)}$
- c) $\sqrt{x^2 - 4 \cdot (x-1)} = 2-x$



7. Gleichungen mit Wurzeln im Nenner

a) $\frac{4x}{\sqrt{x^2 - 1}} = 5$

b) $\frac{6}{\sqrt{x+3}} + 1 = \sqrt{x+3}$

8. Gleichungssysteme

a)
$$\begin{array}{l|l} \sqrt{x} + \sqrt{y} &= 7 \\ 3 \cdot \sqrt{x} - 2 \cdot \sqrt{y} &= 1 \end{array}$$

b)
$$\begin{array}{l|l} 2x^2 - y^2 &= 3 \\ x^2 + 2y^2 &= 14 \end{array}$$

Lernkontrolle

- a) $(x - 4)^2 = 81$
- b) $\sqrt{3 - x} = \sqrt{2x - 9}$
- c) $x + 2 = \sqrt{2x + 19}$
- d) $(2x - 5)^2 = (x + 4)^2$
- e)
$$\begin{array}{l|l} 3x - y &= 5 \\ \sqrt{y - 3} &= x - 2 \end{array}$$