

Bruchrechnen

Definitionen und Regeln

$$\begin{aligned}a/b &:= a : b := \frac{a}{b} \\ \frac{a}{b} \cdot \frac{c}{d} &:= \frac{a}{b} \cdot \frac{c}{d} \\ \frac{a}{b} + \frac{c}{d} &= \frac{ad + bc}{bd} \quad (\text{gleichnamig machen}) \\ \frac{a}{b} \cdot \frac{c}{d} &= \frac{ac}{bd} \\ \frac{\frac{a}{b}}{\frac{c}{d}} &= \frac{ad}{bc} \quad (\text{Multiplikation mit Kehrbruch}) \\ \frac{ab}{ac} &= \frac{b}{c} \quad (\text{kürzen oder erweitern})\end{aligned}$$

Übungen 1

1. $\frac{1}{5} \cdot \frac{1}{7}$

2. $\frac{4}{5} \cdot \frac{-7}{9}$

3. $\frac{6 \cdot 13}{5 \cdot (-13)}$

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

5. $\frac{3}{8} + \frac{5}{9}$

6. $\frac{3}{4} : \frac{5}{7}$

Übungen 2

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

2. $\frac{8}{3} \cdot \frac{-5}{4}$

3. $-\frac{3}{5} \cdot \frac{15}{-9}$

4. $-\frac{11}{15} \left(-\frac{60}{121}\right)$

5. $\frac{23}{25} \cdot \frac{125}{69} \cdot 12$

6. $\frac{42}{123} \cdot \frac{41}{6} \cdot \frac{36}{24} \cdot \frac{3}{14}$

Übungen 3

1. $-\frac{3}{13} : \frac{5}{26}$

2. $\frac{15}{8} : 18$

3. $16 : \frac{-4}{5}$

4. $\frac{75}{49} : \frac{30}{14}$

5. $\left(\frac{1}{4} : \frac{6}{7}\right) : \frac{3}{8}$

6. $\frac{1}{4} : \left(\frac{6}{7} : \frac{3}{8}\right)$

Übungen 4

1. $\frac{8}{5} : \frac{3}{7}$

2. $\frac{5}{42} + \frac{3}{14}$

3. $\frac{1}{6} - \frac{10}{9}$

4. $\frac{13}{3} - 3$

5. $11 - \frac{22}{8}$

6. $\frac{2}{12} - \frac{3}{7}$

7. $\frac{5}{6} + \frac{1}{12} - \frac{7}{24}$

8. $\frac{8}{3} - \frac{5}{9} + \frac{1}{6}$

9. $\frac{3}{2} - \frac{4}{3} - \frac{1}{7}$

10. $\frac{19}{7} - \frac{11}{6} + \frac{6}{21}$

11. $\frac{5}{14} - \frac{2}{35} + \frac{3}{70} - \frac{2}{7}$

12. $\frac{8}{3} - \frac{6}{5} - \frac{3}{4} - \frac{1}{20}$

Übungen 5

1. $\left(\frac{4}{7} : \frac{3}{14}\right) \frac{7}{22}$

2. $\left(\frac{2}{3} - \frac{3}{4}\right) : \frac{5}{6}$

3. $\left(\frac{12}{35} : \frac{15}{14}\right) \frac{5}{2}$

4. $\left(\left(\frac{4}{7} - \left(\frac{3}{5} : \frac{5}{6}\right)\right) \frac{15}{26}\right) - \frac{3}{7}$

5. $\left(\frac{2}{3} - \frac{1}{5} - \frac{5}{6}\right) \left(\frac{2}{11} - \frac{1}{22}\right)$

6. $\left(\frac{7}{22} : \frac{5}{14}\right) : \left(5 - \frac{17}{35}\right)$

Übungen 6

- $\frac{4}{x} - \frac{2}{x}$
- $\frac{4}{x} - \frac{2}{y}$
- $\frac{4c}{x} - \frac{2c}{x}$
- $\frac{n+x}{3} + \frac{n-x}{3}$
- $\frac{ax-ay}{m+n} + \frac{nx+ny}{m+n}$
- $\frac{3x}{6} + \frac{5x}{9}$
- $\frac{a+3b}{2} + \frac{3a-b}{4} + \frac{2a-5y}{8}$
- $\frac{5x}{12a} + \frac{8x}{15b}$
- $\frac{5x+3y}{3a} - \frac{2x+5y}{6b} + \frac{8x+6y}{6ab}$
- $\frac{6x}{bc} \frac{bc}{18x}$
- $\frac{a+b}{n} \frac{c+d}{a-b} \frac{nx}{a+b} \frac{a-b}{c+d}$
- $\frac{2a}{3b} + \frac{5ac}{4bd}$
- $\frac{144abx}{3c} : 12ax$
- $(3 + \frac{5}{8}) a : (\frac{39}{14} \frac{a}{b})$
- $\frac{8ac-4adx-a}{2a}$
- $\frac{6(x+y)}{15(x-y)} : \frac{3(x+y)}{5(x-y)}$
- $\frac{24nx-12bx+16cx}{-4x}$
- $\frac{36x-54z}{4x-6z}$

Lösungen 1

- $\frac{1}{35}$
- $-\frac{28}{45}$
- $-\frac{6}{5}$
- 2
- $\frac{67}{72}$
- $\frac{21}{20}$

Lösungen 2

- $\frac{21}{8}$
- $-\frac{10}{3}$
- 1
- $\frac{4}{11}$
- 20
- $\frac{3}{4}$

Lösungen 3

- $-\frac{6}{5}$
- $\frac{5}{48}$
- 20
- $\frac{5}{7}$
- $\frac{7}{9}$
- $\frac{7}{64}$

Lösungen 4

- $\frac{56}{15}$
- $\frac{1}{3}$
- $-\frac{17}{18}$
- $\frac{4}{3}$
- $\frac{33}{4}$
- $-\frac{11}{42}$
- $\frac{5}{8}$
- $\frac{41}{18}$
- $\frac{1}{42}$
- $\frac{7}{6}$
- $\frac{2}{35}$
- $\frac{2}{3}$

Lösungen 5

- $\frac{28}{33}$
- $-\frac{1}{10}$
- $\frac{4}{5}$
- $-\frac{18}{35}$
- $-\frac{1}{20}$
- $\frac{343}{1738}$

Lösungen 6

- $\frac{2}{x}$
- $\frac{4y-2x}{xy}$
- $\frac{2c}{x}$
- $\frac{2n}{3}$
- $\frac{a(x-y)+n(x+y)}{m+n}$
- $\frac{19x}{18}$
- $\frac{12a+10b-5y}{8}$
- $\frac{20bx+40ax}{60ab} = \frac{x(b+2a)}{3ab}$
- $\frac{10bx+6by-2ax-5ay+8x+6y}{6ab}$
- $\frac{1}{3}$
- x
- $\frac{8ad+15ac}{12bd}$

$$13. \frac{4a^2b}{c}x^2$$

$$14. \frac{203b}{156}$$

$$15. \frac{8ac-4adx-a}{2a} = 4c-2dx-\frac{1}{2}$$

$$16. \frac{6(x+y)5(x-y)}{5(x-y)3(x+y)} = 2$$

$$17. 3b - 4c - 6n$$

$$18. \frac{6(6x-9z)}{4(x-z)} = \frac{3}{2} \frac{(6x-9z)}{(x-z)}$$