Lösungen

Kürzen

1. $\frac{8ac}{12ab} \underset{\text{kürzen}}{\overset{\text{mit } 4a}{=}} \frac{2c}{3b}$

2. $\frac{7x}{3x} \underset{\text{kürzen}}{\overset{\text{mit } x}{=}} \frac{7}{3}$

3. $\frac{24nm}{8pq} \underset{\text{kürzen}}{\overset{\text{mit } 8}{=}} \frac{3nm}{pq}$

4. $\frac{36a-12}{24} = \frac{12(3a-1)}{24} \underset{\text{kürzen}}{\overset{\text{mit } 12}{=}} \frac{3a-1}{2}$

5. $\frac{36a-12}{24} = \frac{4(3n-5m)}{10} \underset{\text{kürzen}}{\overset{\text{mit } 2}{=}} \frac{2(3n-5m)}{5} = \frac{6n-10m}{5}$

6. $\frac{9ab+12ac}{6a} = \frac{3a(3b+4c)}{6a} \underset{\text{kürzen}}{\overset{\text{mit } 3a}{=}} \frac{3a+4c}{2}$

Addition und Subtraktion von Bruchtermen

1. $\frac{3}{2}+\frac{4}{b} = \frac{3\cdot b}{2\cdot b}+\frac{2\cdot 4}{2\cdot b} = \frac{3b}{2b}+\frac{8}{2b} = \frac{3b+8}{2b}$

2. $\frac{2a}{5x}+\frac{3b}{10y} = \frac{2y\cdot 2a}{2y\cdot 5x}+\frac{3b\cdot x}{10y\cdot x}$
$= \frac{4ay}{10yx}+\frac{3bx}{10yx} = \frac{4ay+3bx}{10yx}$

3. $\frac{3a}{4}+\frac{5}{b-c} = \frac{3a(b-c)}{4\cdot(b-c)}+\frac{4\cdot 5}{4\cdot(b-c)}$
$= \frac{3ab-3ac}{4b-4c}+\frac{20}{4b-4c}$
$= \frac{3ab-3ac+20}{4b-4c}$

4. $\frac{5a}{4}-\frac{a}{3b} = \frac{3b\cdot 5a}{3b\cdot 4}-\frac{4\cdot a}{4\cdot 3b}$
$= \frac{15ab}{12b}-\frac{4a}{12b} = \frac{15ab}{12b}$

5. $\frac{7}{3y}-\frac{4}{x} = \frac{7x}{3xy}-\frac{4\cdot 3y}{3xy}$
$= \frac{7x}{3xy}-\frac{12y}{3xy} = \frac{7x-12y}{3xy}$

6. $\frac{c-d}{a+b}-\frac{c+d}{4a+4b} = \frac{4(c-d)}{4(a+b)}-\frac{c+d}{4a+4d}$
$= \frac{4c-4d}{4a+4b}-\frac{c+d}{4a+4d} = \frac{4c-4d-c-d}{4a+4b}$
$= \frac{3c-5d}{4a+4b}$

7. $\frac{c+d}{2a+4b}-\frac{c-d}{-a-2b}$
$= \frac{c+d}{2a+4b}-\frac{(-2)(c-d)}{(-2)(-a-2b)}$
$= \frac{c+d}{2a+4b}-\frac{2d-2c}{2a+4b}$
$= \frac{c+d-2d+2c}{2a+4b} = \frac{3c-d}{2a+4b}$

8. $\frac{m}{2(p-k)}-\frac{2m}{n}$
$=\frac{nm}{2n(p-k)}-\frac{2m\cdot 2(p-k)}{2n(p-k)}$
$=\frac{nm}{2n(p-k)}-\frac{4m(p-k)}{2n(p-k)}$
$=\frac{nm-4m(p-k)}{2n(p-k)}$
$=\frac{m(n-4p+4k)}{2n(p-k)}$

Multiplikation und Division von Bruchtermen

1. $\frac{2a}{3}\cdot\frac{5}{c}=\frac{2a\cdot 5}{3\cdot c}=\frac{10a}{3c}$

2. $\frac{3n}{8m}\cdot\frac{4m}{9p}=\frac{3n\cdot 4m}{8m\cdot 9p}=\frac{n\cdot 1}{2\cdot 3p}=\frac{n}{6p}$

3. $\frac{4a}{a+b}\cdot\frac{2-c}{2c}=\frac{4a\cdot(2-c)}{(a+b)\cdot 2c}=\frac{8a-4ac}{2ac+2bc}$

4. $\frac{4}{5x}\div\frac{2y}{3x}=\frac{4}{5x}\cdot\frac{3x}{2y}=\frac{4\cdot 3x}{5x\cdot 2y}$
$=\frac{2\cdot 3}{5\cdot y}=\frac{6}{5y}$

5. $\frac{2}{3n-m}\div\frac{2y}{3x}=\frac{2}{3n-m}\cdot\frac{n}{6}=\frac{2\cdot n}{(3n-m)\cdot 6}$
$=\frac{n}{(3n-m)\cdot 3}=\frac{n}{9n-3m}$

6. $\frac{4a+2b}{3ac}\div\frac{2a+b}{6a}=\frac{4a+2b}{3ac}\cdot\frac{6a}{2a+b}$
$=\frac{2(2a+b)\cdot 6a}{3ac\cdot(2a+b)}=\frac{2\cdot 2}{c\cdot 1}=\frac{4}{c}$