

## 1.2. Aufgaben zu Bruchtermen

Berechne und vereinfache jeweils:

### Aufgabe 1

$$\begin{array}{llll} \text{a) } \frac{x}{3} + \frac{y}{3} & \text{b) } \frac{3}{m} + \frac{2}{m} & \text{c) } \frac{a}{c} + \frac{b}{c} & \text{d) } \frac{7}{x^3} + \frac{12}{x^3} \\ \frac{13x}{5} - \frac{5x}{5} & \frac{4}{k} - \frac{2}{k} & \frac{15}{3p} - \frac{12}{3p} & \frac{a}{c^2} - \frac{b}{c^2} \end{array}$$

### Aufgabe 2

$$\begin{array}{llll} \text{a) } \frac{x}{5} - \frac{y}{10} & \text{b) } \frac{5}{7d} + \frac{8}{14d} & \text{c) } \frac{5}{a^2} + \frac{3}{a} & \text{d) } \frac{a}{b^3} - \frac{c}{b^2} \\ \frac{x}{3k} - \frac{y}{6k} & \frac{a}{7x} + \frac{b}{14x} & \frac{4}{x} - \frac{2}{x^2} & \frac{2x}{y^2z^2} + \frac{3}{yz} \end{array}$$

### Aufgabe 3

$$\begin{array}{lll} \text{a) } \frac{5x}{2} + \frac{3y}{6} - \frac{2z}{3} & \text{b) } \frac{5}{4x} + \frac{3}{5x} - \frac{7}{20x} & \text{c) } \frac{5}{x^2} - \frac{2}{x} + \frac{3}{x^3} \\ \frac{4a^2}{9} + \frac{2b^2}{6} - \frac{c^2}{18} & \frac{4}{8d} - \frac{2}{6d} + \frac{9}{24d^2} & \frac{3}{9m} - \frac{2}{18mn} + \frac{3}{6n} \end{array}$$

### Aufgabe 4

$$\begin{array}{lll} \text{a) } \frac{x+1}{3} - \frac{2x-4}{2} + \frac{3x-2}{6} & \text{b) } \frac{5}{a^2-b^2} + \frac{3}{a-b} - \frac{2}{a+b} & \text{c) } \frac{4}{p^2-q^2} + \frac{4}{p+q} - \frac{2}{p-q} \\ \frac{3a-4b}{5} - \frac{8a-7b}{2} + \frac{3b-4a}{10} & \frac{5a}{a^2-b^2} - \frac{3}{a+b} + \frac{5}{a-b} & \frac{8}{4x^2-9y^2} - \frac{2}{2x-3y} + \frac{5}{2x+3y} \end{array}$$

### Aufgabe 5

$$\begin{array}{llllll} \text{a) } \frac{x}{a} - \frac{y}{b} & \text{b) } \frac{x}{m} + \frac{y}{n} & \text{c) } \frac{1}{p} - \frac{1}{q} & \text{d) } \frac{7}{k} + 4 & \text{e) } \frac{x}{y} - 1 & \text{f) } 5 + \frac{1}{r} \end{array}$$

### Aufgabe 6

$$\begin{array}{lll} \text{a) } \frac{2a}{5} + \frac{2b}{3} - \frac{c}{6} & \text{b) } \frac{3}{x} + \frac{2}{y} - \frac{1}{z} & \text{c) } \frac{7}{x} + \frac{2}{y} - 1 \\ \frac{4a}{3} + \frac{5b}{2} - \frac{7}{8} & \frac{2x}{5p} + \frac{3y}{4q} - \frac{5z}{r} & \frac{5x}{8} - 1 + y \end{array}$$

### Aufgabe 7

$$\begin{array}{lll} \text{a) } \frac{2a+3b}{5} - \frac{3a-5b}{4} & \text{b) } \frac{5x-3y}{2a} - \frac{2x+3y}{b} & \text{c) } \frac{a}{x+1} - \frac{b}{x-1} \\ \frac{3-a}{x} + \frac{2-a}{y} & \frac{5}{x+1} - \frac{2}{x+2} & \frac{5}{2d-e} + \frac{4}{3d-e} \end{array}$$

### Aufgabe 8

$$\begin{array}{lll} \text{a) } \frac{2a+3b-4c}{4} - \frac{a-3b+5c}{5} & \text{b) } \frac{3x+4y}{2a-b} - \frac{5x+y}{a+3b} & \text{c) } \frac{2x-3y}{10m+3n} + \frac{4x-2y}{5m-2n} \\ \frac{2x+5y-z}{3} + \frac{3x-4y+2z}{5} & \frac{5x+3}{2x-4} + \frac{2x-1}{x+3} & \frac{a+5}{a^2+(a+2)} - \frac{a+5}{a^2-(a+2)} \end{array}$$

### Aufgabe 9

$$\begin{array}{ll} \text{a) } \frac{x^2}{x^2-9} + \frac{x}{x+3} - \frac{x}{x-3} & \text{b) } \frac{a}{2(a+b)} - \frac{b}{3(a-b)} + \frac{ab}{a^2-b^2} \\ \frac{5}{a-b} + \frac{3}{a^2-b^2} + 1 & \frac{4x}{4x-6y} + \frac{2x}{6x+9y} - \frac{3x}{24x^2-54y^2} \end{array}$$

## Lösungen zu den Aufgaben zu Bruchtermen

### Aufgabe 1

$$\begin{array}{llll} \text{a) } \frac{x+y}{3} & \text{b) } \frac{5}{m} & \text{c) } \frac{a+b}{c} & \text{d) } \frac{19}{x^3} \\ \frac{8x}{5} & \frac{2}{k} & \frac{1}{p} & \frac{a-b}{c^2} \end{array}$$

### Aufgabe 2

$$\begin{array}{llll} \text{a) } \frac{2x-y}{10} & \text{b) } \frac{9}{7d} & \text{c) } \frac{5+3a}{a^2} & \text{d) } \frac{a-bc}{b^3} \\ \frac{2x-y}{6k} & \frac{2a+b}{14x} & \frac{4x-2}{x^2} & \frac{2x+3yz}{y^2z^2} \end{array}$$

### Aufgabe 3

$$\begin{array}{lll} \text{a) } \frac{15x+3y-4z}{6} & \text{b) } \frac{3}{2x} & \text{c) } \frac{5x-2x^2+3}{x^3} \\ \frac{8a^2+6b^2-c^2}{18} & \frac{4d+9}{24d^2} & \frac{6n+9m-2}{18mn} \end{array}$$

### Aufgabe 4

$$\begin{array}{lll} \text{a) } \frac{12-x}{6} & \text{b) } \frac{a+5b+5}{a^2-b^2} & \text{c) } \frac{2p-6q+4}{p^2-q^2} \\ \frac{15b-19a}{5} & \frac{7a+8b}{a^2-b^2} & \frac{6x-21y+8}{4x^2-9y^2} \end{array}$$

### Aufgabe 5

$$\text{a) } \frac{bx-ay}{ab} \quad \text{b) } \frac{nx+my}{mn} \quad \text{c) } \frac{q-p}{pq} \quad \text{d) } \frac{7+4k}{k} \quad \text{e) } \frac{x-y}{y} \quad \text{f) } \frac{5r+1}{r}$$

### Aufgabe 6

$$\begin{array}{lll} \text{a) } \frac{12a+20b-5c}{30} & \text{b) } \frac{3yz+2xz-xy}{xyz} & \text{c) } \frac{2x+7y-xy}{xy} \\ \frac{32a+60b-21}{24} & \frac{8qrx+15pry-100pqz}{20pqr} & \frac{5x+8y-8}{8} \end{array}$$

### Aufgabe 7

$$\begin{array}{lll} \text{a) } \frac{37b-7a}{20} & \text{b) } \frac{5bx-4ax-6ay-3by}{2ab} & \text{c) } \frac{ax-bx-a-b}{x^2-1} \\ \frac{3y+2x-ax-ay}{xy} & \frac{3x+8}{x^2+3x+2} & \frac{23d-9e}{6d^2-5de+e^2} \end{array}$$

### Aufgabe 8

$$\begin{array}{lll} \text{a) } \frac{6a+27b-40c}{20} & \text{b) } \frac{-7ax+14bx+2ay+13by}{2a^2+5ab-3b^2} & \text{c) } \frac{50mx-35my+8nx}{50m^2-5mn-6n^2} \\ \frac{19x+13y+z}{15} & \frac{9x^2+8x+13}{2x^2+2x-12} & \frac{-5a^2-11a-14}{a^4-(a+2)^2} \end{array}$$

### Aufgabe 9

$$\begin{array}{ll} \text{a) } \frac{x^2-6x}{x^2-9} & \text{b) } \frac{3a^2+ab-2b^2}{6a^2-6b^2} \\ \frac{a^2-b^2+5a+5b+3}{a^2-b^2} & \frac{32x^2+24xy-3x}{24x^2-54y^2} \end{array}$$