

Rechnen mit Bruchtermen:

1. Vereinfache durch Herausheben und Kürzen:

$$(a) \quad \frac{2x^3 - 3x}{2x} =$$

$$(b) \quad \frac{4x^3 + 3x^2}{2x^2} =$$

$$(c) \quad \frac{3y + 5y^2}{y} =$$

$$(d) \quad \frac{6z^3 - 5z}{2z} =$$

$$(e) \quad \frac{9y - 3y^3}{3y} =$$

$$(f) \quad \frac{8z^4 - 3z^3}{5z^2} =$$

$$(g) \quad \frac{4a^2 - 4a}{8a^2} =$$

$$(h) \quad \frac{12a^3 + 8a^2}{4a^3} =$$

$$(i) \quad \frac{5r^2 + 10rs}{2r} =$$

$$(j) \quad \frac{16g^3 - 14g^2h^3}{2g^2} =$$

$$(k) \quad \frac{5x - 10y}{15x + 5y} =$$

$$(l) \quad \frac{6 - 3z}{6 + 12z} =$$

$$(m) \quad \frac{8a + 4ab}{6ab - 2a} =$$

$$(n) \quad \frac{7ab + 14a}{14a^2 + 7ab} =$$

$$(o) \quad \frac{6a^2 + 2ab}{12ab + 4b^2} =$$

$$(p) \quad \frac{3rs + 6r^2}{9r - 3rs} =$$

$$(q) \quad \frac{5x^3 + 10x^2y}{5x^2 - 15xy} =$$

$$(r) \quad \frac{6z^5 - 3z^2}{9z^2 + 6z^3} =$$

$$(s) \quad \frac{5a^2b - 10a^2}{3ab - 6a} =$$

$$(t) \quad \frac{2a^2 + 3ab}{2ab + 3b^2} =$$

2. Vereinfache:

$$(a) \quad \frac{(4x^2 - 4)(x + 3)}{(2x - 2)(2x + 4)} =$$

$$(b) \quad \frac{8y - 8}{(2y - 2)(4y + 8)} =$$

$$(c) \quad \frac{y^2 - 9}{3y + y^2} =$$

$$(d) \quad \frac{5x^2 - 5}{(x + 1)^2} =$$

$$(e) \quad \frac{10z - 10}{(5z - 5)(2z + 4)} =$$

$$(f) \quad \frac{7x^2 - 28}{(8 - 4x)(x + 3)} =$$

$$(g) \quad \frac{6x^2 - 6}{15x + 15x^2} =$$

$$(h) \quad \frac{6x + 12}{(3x + 6)(2x - 4)} =$$

$$(i) \quad \frac{3x^2 + 3x}{4x^2 - 4} =$$

$$(j) \quad \frac{18x^2 - 18x}{27x^2} =$$

$$(k) \quad \frac{75 - 3x^2}{(2x - 10)(3x + 6)} =$$

$$(l) \quad \frac{16x^2 - 16}{12 - 12x^2} =$$

3. Finde das kleinste gemeinsame Vielfache und vereinfache:

$$(a) \quad \frac{2r}{5st} + \frac{s}{6rt} + \frac{t}{10rs} =$$

$$(b) \quad \frac{3x}{(x+5)(x-1)} + \frac{2x}{(x-1)(x-2)} =$$

$$(c) \quad \frac{1}{2x+5} + \frac{6}{3-x} =$$

$$(d) \quad \frac{10}{x^2-1} + \frac{5}{x+1} =$$

$$(e) \quad \frac{4y-1}{3y+3} - \frac{1-2y}{y^2-1} =$$

$$(f) \quad \frac{3z^2+8}{9z^2-16} - \frac{3z-1}{12+9z} =$$

$$(g) \quad \frac{2r}{rs-s^2} - \frac{2s}{r^2-rs} - \frac{r+s}{rs} =$$

$$(h) \quad \frac{2s}{s-3} - \frac{7s^2}{s^2-9} - \frac{5s}{3-s} =$$

$$(i) \quad \frac{1}{a^2} + \frac{b}{a^3-ab^2} - \frac{b}{a^3+a^2b} =$$

$$(j) \quad \frac{d}{de-e^2} - \frac{e}{d^2+de} - \frac{1}{d+e} + \frac{1}{d} =$$

$$(k) \quad \frac{d}{de-e^2} - \frac{e}{d^2+de} - \frac{1}{d+e} + \frac{1}{d-e} =$$

$$(l) \quad \frac{r+s}{6(r-s)^2} - \frac{r-s}{6(r+s)^2} - \frac{4s^3}{3(r^2-s^2)^2} =$$

4. Vereinfache:

$$(a) \quad \frac{7(x-1)}{4x+12} \cdot \frac{2x-6}{3x-3} =$$

$$(b) \quad \frac{9x-3}{3x+12} \cdot \frac{3x+6}{2-6x} =$$

$$(c) \quad \frac{(x+2)^2}{x^2-6x} \cdot \frac{3x-18}{4+2x} =$$

$$(d) \quad \frac{3(x+7)}{8x-16} \cdot \frac{5x-10}{28+4x} =$$

$$(e) \quad \frac{5x+10}{6x-9} \cdot \frac{2x^2-3x}{x^2+2x} =$$

$$(f) \quad \frac{4x^2-9}{16x^2-25} \cdot \frac{16x+20}{9-6x} =$$

$$(g) \quad \frac{5x+2}{3x^2-9x} \cdot (18-6x) =$$

$$(h) \quad \frac{2x-1}{(x-2)(x+3)} \cdot (x^3+3x^2) =$$

$$(i) \quad \frac{1}{25x^2-9} \cdot (5x+3)^2 =$$

$$(j) \quad \frac{5-x}{(6x-6)(5x^2-10x)} \cdot (4x^2-4) =$$

$$(k) \quad \frac{x}{y^2-xy} \cdot (x-y) =$$

$$(l) \quad \frac{6x^2y}{4x^2-6xy} \cdot (2x-3y) =$$

$$(m) \quad \frac{2x+y}{4x^2-9y^2} \cdot (2x+3y) =$$

$$(n) \quad (2x-7y) \cdot \frac{3x+y}{4x^2-49y^2} =$$

5. Vereinfache:

$$(a) \quad \frac{a-2b}{2a-b} : \frac{2b-a}{b-2a} =$$

$$(b) \quad \frac{4a+8b}{20a-30b} : \frac{3a+6b}{10a-15b} =$$

$$(c) \quad \frac{2x-y}{x+3y} : \frac{4x^2-y^2}{x^2-9y^2} =$$

$$(d) \quad \frac{9x^2-y^2}{x^2-y^2} : \frac{6x-2y}{3x+3y} =$$

$$(e) \quad \frac{5r^2}{3r+2s} : \frac{10r}{3rs+2s^2} =$$

$$(f) \quad \frac{pq+3q^2}{7q^2} : \frac{2p+6q}{21q} =$$

Lösungen:

1a) $\frac{-3+2x^2}{2}$

1b) $\frac{3+4x}{2}$

1c) $3+5y$

1d) $\frac{-5+6z^2}{2}$

1e) $3-y^2$

1f) $\frac{-3z+8z^2}{5}$

1g) $\frac{-1+a}{2a}$

1h) $\frac{2+3a}{a}$

1i) $\frac{5(r+2s)}{2}$

1j) $8g-7h^3$

1k) $\frac{x-2y}{3x+y}$

1l) $\frac{2-z}{2(1+2z)}$

1m) $\frac{2(2+b)}{-1+3b}$

1n) $\frac{2+b}{2a+b}$

1o) $\frac{a}{2b}$

1p) $\frac{-2r-s}{-3+s}$

1q) $\frac{x^2+2xy}{x-3y}$

1r) $\frac{-1+2z^3}{3+2z}$

1s) $\frac{5a}{3}$

1t) $\frac{a}{b}$

2a) $\frac{3+4x+x^2}{2+x}$

2b) $\frac{1}{2+y}$

2c) $\frac{-3+y}{y}$

2d) $\frac{5(-1+x)}{1+x}$

2e) $\frac{1}{2+z}$

2f) $\frac{-7(2+x)}{4(3+x)}$

2g) $\frac{2(-1+x)}{5x}$

2h) $\frac{1}{-2+x}$

2i) $\frac{3x}{4(-1+x)}$

2j) $\frac{2(-1+x)}{3x}$

2k) $\frac{-5-x}{2(2+x)}$

2l) $-\frac{4}{3}$

3a) $\frac{12r^2+5s^2+3t^2}{30rst}$

3b) $\frac{4x+5x^2}{10-13x+2x^2+x^3}$

3c) $\frac{-11(3+x)}{(-3+x)(5+2x)}$

3d) $\frac{5}{-1+x}$

3e) $\frac{-2+y+4y^2}{3(-1+y^2)}$

3f) $\frac{5}{3(-4+3z)}$

3g) $\frac{r+s}{rs}$

3h) $\frac{21s}{-9+s^2}$

3i) $\frac{1}{a^2-b^2}$

3j) $\frac{d}{(d-e)e}$

3k) $\frac{d^2+e^2}{d(d-e)e}$

3l) $-\frac{s}{-r^2+s^2}$

4a) $\frac{7(-3+x)}{6(3+x)}$

4b) $\frac{-3(2+x)}{2(4+x)}$

4c) $\frac{3(2+x)}{2x}$

4d) $\frac{15}{32}$

4e) $\frac{5}{3}$

4f) $\frac{-4(3+2x)}{3(-5+4x)}$

4g) $\frac{-2(2+5x)}{x}$

4h) $\frac{-x^2+2x^3}{-2+x}$

4i) $\frac{3+5x}{-3+5x}$

4j) $\frac{-2(-5-4x+x^2)}{15(-2+x)x}$

4k) $-\frac{x}{y}$

4l) $3xy$

4m) $\frac{2x+y}{2x-3y}$

4n) $\frac{3x+y}{2x+7y}$

5a) 1

5b) $\frac{2(a-2b)}{3(a+2b)}$

5c) $\frac{x-3y}{2x+y}$

5d) $\frac{3(3x+y)}{2(x-y)}$

5e) $\frac{rs}{2}$

5f) $\frac{3}{2}$