

DIE AUFGABEN

**Wichtig: Sie sollten keine Klammern ausmultiplizieren!
In aller Regel werden Sie sogar weiter faktorisieren müssen.
Sie sollten die Aufgaben der Übung 6 begriffen haben!**

$$1 \quad 4z \cdot \frac{z+1}{8z^2+12z} =$$

$$2 \quad \frac{5x+5y}{8x-8y} \cdot \frac{20x-20y}{3x+3y} =$$

$$3 \quad \frac{5a^2}{5b-3} \cdot \frac{9-15b}{10ac} =$$

$$4 \quad \frac{5}{q^2-1} \cdot (q-1) =$$

$$5 \quad \frac{x^2+y^2}{x^2-y^2} \cdot \frac{x-y}{xy} =$$

$$6 \quad \frac{7r^2s}{12(r-s)} \cdot \frac{(2s-2r)^2}{21rs^2} =$$

$$7 \quad \frac{d}{d^2-8d+15} \cdot (d-5) =$$

$$8 \quad (3x+3y) \cdot \frac{9}{x+y} =$$

$$9 \quad \frac{d-1}{18d} \cdot \frac{12d^2}{1-d} =$$

$$10 \quad \frac{t}{4u+4v} \cdot \frac{3u^2-3v^2}{t^2+t} =$$

$$11 \quad \frac{v^2+4v+4}{3t-3} \cdot \frac{9t-9}{v^2+5v+6} =$$

$$12 \quad \frac{x^2-6xy+9y^2-z^2}{5m-5n} \cdot \frac{m^4-n^4}{x-3y+z} =$$

DIE LÖSUNGEN

$$1 \quad 4z \cdot \frac{z+1}{8z^2+12z} = \frac{4z(z+1)}{4z(2z+3)} = \frac{z+1}{2z+3}$$

$$2 \quad \frac{5x+5y}{8x-8y} \cdot \frac{20x-20y}{3x+3y} = \frac{5(x+y) \cdot 20(x-y)}{8(x-y) \cdot 3(x+y)} = \frac{25}{6}$$

$$3 \quad \frac{5a^2}{5b-3} \cdot \frac{9-15b}{10ac} = \frac{5a^2 \cdot 3(3-5b)}{(5b-3) \cdot 10ac} = \frac{5a^2 \cdot (-3)(-3+5b)}{(5b-3) \cdot 10ac} = -\frac{3a}{2c}$$

$$4 \quad \frac{5}{q^2-1} \cdot (q-1) = \frac{5 \cdot (q-1)}{(q-1)(q+1)} = \frac{5}{q+1}$$

$$5 \quad \frac{x^2+y^2}{x^2-y^2} \cdot \frac{x-y}{xy} = \frac{(x^2+y^2) \cdot (x-y)}{(x+y) \cdot (x-y) \cdot xy} = \frac{x^2+y^2}{xy(x+y)}$$

$$6 \quad \frac{7r^2s}{12(r-s)} \cdot \frac{(2s-2r)^2}{21rs^2} = \frac{7r^2s \cdot (2s-2r)(2s-2r)}{12(r-s) \cdot 21rs^2} = \frac{r \cdot 2(s-r) \cdot 2(s-r)}{12(r-s) \cdot 3s}$$
$$= \frac{r \cdot (-1)(-s+r) \cdot (s-r)}{3(r-s) \cdot 3s} = \frac{r \cdot (-1)(s-r)}{3 \cdot 3s} = -\frac{r(s-r)}{9s}$$

$$7 \quad \frac{d}{d^2-8d+15} \cdot (d-5) = \frac{d(d-5)}{(d-5)(d-3)} = \frac{d}{d-3}$$

$$8 \quad (3x+3y) \cdot \frac{9}{x+y} = \frac{(3x+3y) \cdot 9}{x+y} = \frac{27(x+y)}{x+y} = 27$$

$$9 \quad \frac{d-1}{18d} \cdot \frac{12d^2}{1-d} = \frac{(d-1) \cdot 12d^2}{-18d(-1+d)} = -\frac{2d}{3}$$

$$10 \quad \frac{t}{4u+4v} \cdot \frac{3u^2-3v^2}{t^2+t} = \frac{t \cdot 3(u+v)(u+v)}{4(u+v) \cdot t(t+1)} = \frac{3(u+v)}{4(t+1)}$$

$$11 \quad \frac{v^2+4v+4}{3t-3} \cdot \frac{9t-9}{v^2+5v+6} = \frac{(v+2)(v+2) \cdot 9(t-1)}{3(t-1) \cdot (v+2)(v+3)} = \frac{3(v+2)}{v+3}$$

$$12 \quad \frac{x^2-6xy+9y^2-z^2}{5m-5n} \cdot \frac{m^4-n^4}{x-3y+z} = \frac{(x-3y+z)(x-3y-z) \cdot (m^2+n^2)(m+n)(m-n)}{5(m-n)(x-3y+z)}$$
$$= \frac{(x-3y-z)(m^2+n^2)(m+n)}{5}$$

$$x^2-6xy+9y^2-z^2 = (x-3y)^2-z^2 = [(x-3y)+z][(x-3y)-z] = (x-3y+z)(x-3y-z)$$

$$m^4-n^4 = (m^2+n^2)(m^2-n^2) = (m^2+n^2)(m+n)(m-n)$$