

Binomische Formeln (Level 2)

Aufgabe

Multipliziere die folgenden Terme mit Hilfe der binomischen Formeln aus:

a) $(7p + 8x) \cdot (7p - 8x)$

b) $(2q + 2w)^2$

c) $(4n + v)^2$

d) $(10k - 9z)^2$

e) $(4m - 2e)^2$

f) $(8a + 9t)^2$

g) $(10s + 7q)^2$

h) $(10t - 6d)^2$

i) $(8s + 8x) \cdot (8s - 8x)$

j) $(3d - 3w)^2$

k) $(5w + 5b)^2$

l) $(3y + 3r)^2$

m) $(5t - 2m)^2$

n) $(2r + 2u)^2$

o) $(7r - 10r)^2$

p) $(8m - 2y)^2$

q) $(p + 3u) \cdot (p - 3u)$

r) $(3k - 7m)^2$

s) $(5k + 4c)^2$

t) $(10z - 8c)^2$

u) $(5a + 2p) \cdot (5a - 2p)$

v) $(7p + 7t)^2$

w) $(4e + 5w) \cdot (4e - 5w)$

x) $(d + 4t)^2$

y) $(7c - 9v)^2$

z) $(8e + 9d) \cdot (8e - 9d)$

Tipp

Es gibt drei binomische Formeln:

I. $(a + b)^2 = a^2 + 2ab + b^2$

II. $(a - b)^2 = a^2 - 2ab + b^2$

III. $(a + b) \cdot (a - b) = a^2 - b^2$

Rechenweg

- a) $(7p + 8x) \cdot (7p - 8x) = (7p)^2 - (8x)^2 = 49p^2 - 64x^2$
- b) $(2q + 2w)^2 = (2q)^2 + 2 \cdot 2q \cdot 2w + (2w)^2 = 4q^2 + 8qw + 4w^2$
- c) $(4n + v)^2 = (4n)^2 + 2 \cdot 4n \cdot v + v^2 = 16n^2 + 8nv + v^2$
- d) $(10k - 9z)^2 = (10k)^2 - 2 \cdot 10k \cdot 9z + (9z)^2 = 100k^2 - 180kz + 81z^2$
- e) $(4m - 2e)^2 = (4m)^2 - 2 \cdot 4m \cdot 2e + (2e)^2 = 16m^2 - 16em + 4e^2$
- f) $(8a + 9t)^2 = (8a)^2 + 2 \cdot 8a \cdot 9t + (9t)^2 = 64a^2 + 144at + 81t^2$
- g) $(10s + 7q)^2 = (10s)^2 + 2 \cdot 10s \cdot 7q + (7q)^2 = 100s^2 + 140qs + 49q^2$
- h) $(10t - 6d)^2 = (10t)^2 - 2 \cdot 10t \cdot 6d + (6d)^2 = 100t^2 - 120dt + 36d^2$
- i) $(8s + 8x) \cdot (8s - 8x) = (8s)^2 - (8x)^2 = 64s^2 - 64x^2$
- j) $(3d - 3w)^2 = (3d)^2 - 2 \cdot 3d \cdot 3w + (3w)^2 = 9d^2 - 18dw + 9w^2$
- k) $(5w + 5b)^2 = (5w)^2 + 2 \cdot 5w \cdot 5b + (5b)^2 = 25w^2 + 50bw + 25b^2$
- l) $(3y + 3r)^2 = (3y)^2 + 2 \cdot 3y \cdot 3r + (3r)^2 = 9y^2 + 18ry + 9r^2$
- m) $(5t - 2m)^2 = (5t)^2 - 2 \cdot 5t \cdot 2m + (2m)^2 = 25t^2 - 20mt + 4m^2$
- n) $(2r + 2u)^2 = (2r)^2 + 2 \cdot 2r \cdot 2u + (2u)^2 = 4r^2 + 8ru + 4u^2$
- o) $(7r - 10r)^2 = (7r)^2 - 2 \cdot 7r \cdot 10r + (10r)^2 = 49r^2 - 140r^2 + 100r^2$
- p) $(8m - 2y)^2 = (8m)^2 - 2 \cdot 8m \cdot 2y + (2y)^2 = 64m^2 - 32my + 4y^2$
- q) $(p + 3u) \cdot (p - 3u) = p^2 - (3u)^2 = p^2 - 9u^2$
- r) $(3k - 7m)^2 = (3k)^2 - 2 \cdot 3k \cdot 7m + (7m)^2 = 9k^2 - 42km + 49m^2$
- s) $(5k + 4c)^2 = (5k)^2 + 2 \cdot 5k \cdot 4c + (4c)^2 = 25k^2 + 40ck + 16c^2$
- t) $(10z - 8c)^2 = (10z)^2 - 2 \cdot 10z \cdot 8c + (8c)^2 = 100z^2 - 160cz + 64c^2$
- u) $(5a + 2p) \cdot (5a - 2p) = (5a)^2 - (2p)^2 = 25a^2 - 4p^2$
- v) $(7p + 7t)^2 = (7p)^2 + 2 \cdot 7p \cdot 7t + (7t)^2 = 49p^2 + 98pt + 49t^2$
- w) $(4e + 5w) \cdot (4e - 5w) = (4e)^2 - (5w)^2 = 16e^2 - 25w^2$
- x) $(d + 4t)^2 = d^2 + 2 \cdot d \cdot 4t + (4t)^2 = d^2 + 8dt + 16t^2$

$$y) (7c - 9v)^2 = (7c)^2 - 2 \cdot 7c \cdot 9v + (9v)^2 = 49c^2 - 126cv + 81v^2$$

$$z) (8e + 9d) \cdot (8e - 9d) = (8e)^2 - (9d)^2 = 64e^2 - 81d^2$$

Lösung

a) $49p^2 - 64x^2$

d) $100k^2 - 180kz + 81z^2$

g) $100s^2 + 140qs + 49q^2$

j) $9d^2 - 18dw + 9w^2$

m) $25t^2 - 20mt + 4m^2$

p) $64m^2 - 32my + 4y^2$

s) $25k^2 + 40ck + 16c^2$

v) $49p^2 + 98pt + 49t^2$

y) $49c^2 - 126cv + 81v^2$

b) $4q^2 + 8qw + 4w^2$

e) $16m^2 - 16em + 4e^2$

h) $100t^2 - 120dt + 36d^2$

k) $25w^2 + 50bw + 25b^2$

n) $4r^2 + 8ru + 4u^2$

q) $p^2 - 9u^2$

t) $100z^2 - 160cz + 64c^2$

w) $16e^2 - 25w^2$

z) $64e^2 - 81d^2$

c) $16n^2 + 8nv + v^2$

f) $64a^2 + 144at + 81t^2$

i) $64s^2 - 64x^2$

l) $9y^2 + 18ry + 9r^2$

o) $49r^2 - 140r^2 + 100r^2$

r) $9k^2 - 42km + 49m^2$

u) $25a^2 - 4p^2$

x) $d^2 + 8dt + 16t^2$