

### BINOMISCHE FORMELN - LÖSUNG

①  $(a+b)^2 = a^2 + 2ab + b^2$

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

$(a+b)(a-b) = a^2 - b^2$

② a)  $(3+6)^2 = 9 + 66 + 6^2$

b)  $(3-6)^2 = 3^2 - 2 \cdot 3 \cdot 6 + 6^2 = 9 - 66 + 6^2$

c)  $(-3+6)^2 = 9 - 66 + 6^2$

d)  $(2x+5)^2 = 4x^2 + 20x + 25$

e)  $(2x+3x^4)^2 = 4x^2 + 12x^6 + 9x^8$

f)  $(a-3)(a+3) = a^2 - 9$

g)  $(b^2+4)(b^2-4) = (b^2)^2 - 4^2 = b^4 - 16$

h)  $(2x+3)(2x-3) = 4x^2 - 9$

i)  $(2x+3)(2x+3) = 4x^2 + 12x + 9$

j)  $(-3-b)^2 = (-3)^2 + 2 \cdot (-3) \cdot (-b) + (-b)^2 = 9 + 6b + b^2$

$x^2 \cdot x^4 = x^{2+4} = x^6$   
 $\frac{x \cdot x \cdot x \cdot x}{x \cdot x} = \frac{x \cdot x \cdot x}{1} = x^3$   
 $(x^2)^3 = x^{2 \cdot 3} = x^6$

③ a)  $a^2 + 4ab + 4b^2 = (a+2b)^2$

b)  $4a^2 - 12ab + 9b^2 = (2a-3b)^2$

c)  $25x^2 + 40xy + 16y^2 = (5x+4y)^2$

d)  $x^4 + 2x^2y^2 + y^4 = (x^2 + y^2)^2$

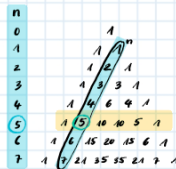
e)  $x^4 - y^4 = (x^2 + y^2)(x^2 - y^2)$

f)  $25x^2 - 16y^2 = (5x+4iy)(5x-4iy)$

g)  $25x^2 + 16y^2 = 25x^2 - 16y \cdot i^2 = (5x+4iy)(5x-4iy)$

$\sqrt{9} = 3$   
 $\sqrt{-9} = 3i$   
 $i^2 = -1$   
 Komplex Zahlen

④ a)



$(a+b)^2 = 1a^2 + 2ab + 1b^2$

b)  $(x+y)^4 = 1 \cdot x^4 \cdot y^0 + 4 \cdot x^3 \cdot y^1 + 6 \cdot x^2 \cdot y^2 + 4 \cdot x^1 \cdot y^3 + 1 \cdot x^0 \cdot y^4$   
 $= x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4$

c)  $(3-3x)^3 = 1 \cdot 3^3 \cdot (-3)^0 + 3 \cdot 3^2 \cdot (-3)^1 + 3 \cdot 3^1 \cdot (-3)^2 + 1 \cdot 3^0 \cdot (-3)^3$   
 $= 27 - 81x + 81x^2 - 27x^3$

d)  $(5+x)^5 = 1 \cdot 5^5 \cdot x^0 + 5 \cdot 5^4 \cdot x^1 + 10 \cdot 5^3 \cdot x^2 + 10 \cdot 5^2 \cdot x^3 + 5 \cdot 5^1 \cdot x^4 + 1 \cdot 5^0 \cdot x^5$   
 $= 3125 + 3125x + 1250x^2 + 250x^3 + 25x^4 + x^5$

e)  $(-2-4x)^2 = 1 \cdot (-2)^2 \cdot (-4x)^0 + 2 \cdot (-2) \cdot (-4x)^1 + 1 \cdot (-2)^2 \cdot (-4x)^2$   
 $= -8 - 48x - 64x^2$