

Binomial formula

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

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

$$3 \quad (a+b)(a-b) = a^2 - b^2$$

examples

72

a) $(r + s)^2$

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

g) $(25 + 2x)^2$

b) $(k + 3)^2$

e) $(3k + 4m)^2$

h) $(9a + 2b)^2$

c) $(9 + x)^2$

f) $(7d + 2e)^2$

i) $(8m + 5n)^2$

73

a) $(x - y)^2$

d) $(4m - 5)^2$

g) $(9x - 2y)^2$

b) $(a - 3)^2$

e) $(6m - 5)^2$

h) $(5d - 2e)^2$

c) $(m - n)^2$

f) $(3k - 4)^2$

i) $(5x - 7y)^2$

74

a) $(x + 3)(x - 3)$

d) $(7x + 4y)(7x - 4y)$

g) $(2d + 3e)(2d - 3e)$

b) $(5 + k)(5 - k)$

e) $(5u + 12)(5u - 12)$

h) $(5v + 3w)(5v - 3w)$

c) $(5 + m)(5 - m)$

f) $(2k + 3m)(2k - 3m)$

i) $(4e + 5f)(4e - 5f)$

75

a) $(a^2 + 1)^2$

d) $(2b^2 - 4)^2$

g) $(2m^2 - 3n^2)^2$

b) $(3a^2 + 5)^2$

e) $(4x^2 + 5y^2)^2$

h) $(0,5p^2 + 4q^2)^2$

c) $(b^2 - 3)^2$

f) $(6m^2 - 8n^2)^2$

i) $(7e - 3f^2)^2$

76

a) $(\frac{1}{3} + \frac{2}{5}q)^2$

b) $(\frac{3}{4}r - \frac{1}{2}s)^2$

c) $(\frac{3}{4}u - \frac{5}{6}v)^2$

d) $(\frac{2}{3}x + \frac{1}{5}y)^2$

e) $(\frac{5}{8}m + \frac{1}{5}n)^2$

f) $(\frac{1}{3}a - \frac{4}{7}b)^2$

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a) $(\frac{3}{5}p + \frac{1}{4}q)(\frac{3}{5}p - \frac{1}{4}q)$

b) $(\frac{1}{8}x + \frac{1}{3}y)(\frac{1}{8}x - \frac{1}{3}y)$

c) $(0,2a + 0,3b)(0,2a - 0,3b)$

d) $(3a^2 + 4b^2)(3a^2 - 4b^2)$

e) $(b^3 + 1)(b^3 - 1)$

f) $(k^5 + m^4)(k^5 - m^4)$

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Berechne mit Hilfe der Binomischen Formeln.

a) $32^2; 24^2; 43^2$

b) $48^2; 67^2; 88^2$

c) $73^2; 77^2; 94^2$

d) $304^2; 298^2; 1001^2$

e) $64 \cdot 56$

f) $92 \cdot 88$

g) $47 \cdot 53$

h) $119 \cdot 121$

i) $1005 \cdot 995$

79

a) $(3a - 5b)^2 - (a - 4b)(a + 4b) - (2a + 7b)^2$

b) $(4x + 1)^2 - (3x + 1)(3x - 1) - (7x - 3y)(3y + 7x)$

c) $(4m + n)^2 + (2m - 5n)(2m + 5n) - (m - 3n)^2$

d) $(5p - 2)^2 - (3 - 4p)^2 - (4 - p)(4 + p)$

e) $(6a - b)^2 + (6a - b)(6a + b) - (6a + b)^2$

f) $(3x - 7y)^2 - (7x - 3y)^2 - (7x - 3y)(3y + 7x)$

80

a) $(a + 4)^2 + (a + 1)(a - 1)$

b) $(2a + 3b)(2a - 3b) + (2a + 5b)(2a - 5b)$

c) $(3u - 8v)^2 - (6u - 4v)(6u + 4v)$

d) $(9p + 4q)^2 - (2p + 3q)(2p - 3q) - (6p - q)^2$

$(0,5r + 0,1s)^2 - (0,1r - 0,2s)^2$

$$\sqrt{81x^2+180x+100}$$

$$\sqrt{4x^2-4x+1}$$

$$\sqrt{64x^2+96x+36}$$

$$\sqrt{9x^2+60x+100}$$

$$\sqrt{25x^2-40x+16}$$

$$\sqrt{81x^2-90x+25}$$

$$\sqrt{36x^2+84x+49}$$

$$\sqrt{81x^2-144x+64}$$

$$\sqrt{4x^2-32x+64}$$

$$\sqrt{25x^2+90x+81}$$

$$\sqrt{9x^2+48x+64}$$

$$\sqrt{36x^2+96x+64}$$

$$\sqrt{64x^2+32x+4}$$

$$\sqrt{4x^2+4x+1}$$

$$\sqrt{81x^2-90x+25}$$

$$\sqrt{16x^2+56x+49}$$

$$\sqrt{16x^2+24x+9}$$

$$\sqrt{100x^2-160x+64}$$

$$\sqrt{25x^2-20x+4}$$

$$\sqrt{100x^2-80x+16}$$

$$\sqrt{4x^2-40x+100}$$

$$\sqrt{4x^2-12x+9}$$

$$\sqrt{64x^2+64x+16}$$

$$\sqrt{100x^2-60x+9}$$

$$\sqrt{25x^2-80x+64}$$

$$\sqrt{25x^2+10x+1}$$

$$\sqrt{x^2-4x+4}$$

$$\sqrt{81x^2+162x+81}$$

$$\sqrt{36x^2+84x+49}$$

$$\sqrt{36x^2+120x+100}$$

$$81x^2 - \square + \square = (\square - 1)^2$$

$$\square + 60x + 100 = (\square - 10)^2$$

$$4x^2 + \square + \square = (\square + 7)^2$$

$$\square + 4ab + \square = (\square + 2b)^2$$

$$\square + 20x + \square = (2x + \square)^2$$

$$\square - 1 = (\square + \square) \cdot (6n - \square)$$

$$900m^2 - \square = (\square + \square) \cdot (\square - 80n)$$

$$\square + \square + c^2 = (3b + \square)^2$$

$$x^2 - xy + \square = (\square - \frac{1}{2}y)^2$$

$$\square - b^2 = (\square - \square) \cdot (7 + \square)$$

$$\square - \square = (\square - \frac{1}{2}) \cdot (\frac{1}{3}x + \square)$$

$$\square + 18uv + \square = (u + \square)^2$$

$$\square - 20x + 5 = 5 \cdot (4x^2 - \square + \square) = \square \cdot (\square - \square)^2$$

$$\square - 6ab + 0,5b^2 = 2 \cdot (9a^2 - \square + \square) = \square \cdot (\square + \square)^2$$

$$4 + \square + \square = (\square + 30)^2$$

$$\square - \square + 4 = (\square - 2)^2$$

$$\square - 16x + \square = (\square - 8)^2$$

$$\square - 4mn + \square = (2n - \square)^2$$

$$\square + \square + 4y^2 = (9x + \square)^2$$

$$\square - 12xy + \square = (\square - y)^2$$

$$0,01n^2 + 0,2n + \square = (\square + 1)^2$$

$$121 + \square + \square = (\square + 3x)^2$$

$$\square + \square + 36y^2 = (10x + \square)^2$$

$$50a^2 - 200a + 200 = \square \cdot (\square - \square + \square) = \square \cdot (\square - \square)^2$$

$$128x^2 - 98y^2 = \square \cdot (\square - \square) = \square \cdot (\square - \square) \cdot (\square + \square)$$