

## Rövidített számolási képletek

$$1) a^2 - b^2 = (a-b)(a+b) \qquad 2) a^2 + b^2 = (a-ib)(a+ib) \text{ ahol } i = \sqrt{-1}$$

$$3) x - y = (\sqrt{x} - \sqrt{y})(\sqrt{x} + \sqrt{y})$$

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

$$5) a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$6) x - y = (\sqrt[3]{x} - \sqrt[3]{y})(\sqrt[3]{x^2} + \sqrt[3]{xy} + \sqrt[3]{y^2})$$

$$7) x + y = (\sqrt[3]{x} + \sqrt[3]{y})(\sqrt[3]{x^2} - \sqrt[3]{xy} + \sqrt[3]{y^2})$$

$$8) a^4 - b^4 = (a^2 - b^2)(a^2 + b^2) = (a-b)(a+b)(a^2 + b^2)$$

$$9) a^4 + b^4 = (a^2 + b^2 - ab\sqrt{2})(a^2 + b^2 + ab\sqrt{2})$$

$$10) a^6 - b^6 = (a^3 - b^3)(a^3 + b^3) = (a-b)(a+b)(a^2 + ab + b^2)(a^2 - ab + b^2)$$

$$11) a^6 + b^6 = (a^2 + b^2)(a^4 - a^2b^2 + b^4)$$

$$12) a^5 - b^5 = (a-b)(a^4 + a^3b + a^2b^2 + ab^3 + b^4)$$

$$13) a^5 + b^5 = (a-b)(a^4 + a^3b + a^2b^2 + ab^3 + b^4)$$

$$14) a^n - b^n = (a-b)(a^{n-1} + a^{n-2}b + \dots + ab^{n-2} + b^{n-1})$$

$$15) x - y = (\sqrt[n]{x} - \sqrt[n]{y})(\sqrt[n]{x^{n-1}} + \sqrt[n]{x^{n-2}y} + \dots + \sqrt[n]{xy^{n-2}} + \sqrt[n]{y^{n-1}})$$

$$16) a^{2n+1} + b^{2n+1} = (a+b)(a^{2n} - a^{2n-1}b + \dots - ab^{2n-1} + b^{2n})$$

$$17) x + y = (\sqrt[2n+1]{x} + \sqrt[2n+1]{y})(\sqrt[2n+1]{x^{2n}} - \sqrt[2n+1]{x^{2n-1}y} + \dots - \sqrt[2n+1]{xy^{2n-1}} + \sqrt[2n+1]{y^{2n}})$$

$$18) 1 + x + x^2 + \dots + x^{n-1} = \frac{x^n - 1}{x - 1}$$

$$19) 1 - x + x^2 - x^3 \dots - x^{2n-1} + x^{2n} = \frac{x^{2n+1} + 1}{x + 1}$$

$$20) (a+b)^2 = a^2 + 2ab + b^2$$

$$21) (a-b)^2 = a^2 - 2ab + b^2$$

$$22) (x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$$

$$23) (a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 = a^3 + b^3 + 3ab(a+b)$$

$$24) (a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 = a^3 - b^3 - 3ab(a-b)$$

$$25) (a+b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$$

$$26) (a-b)^4 = a^4 - 4a^3b + 6a^2b^2 - 4ab^3 + b^4$$

$$27) (a+b)^n = a^n + C_n^1 a^{n-1}b + C_n^2 a^{n-2}b^2 + \dots + C_n^{n-2} a^2 b^{n-2} + C_n^{n-1} a b^{n-1} + b^n \text{ ahol } C_n^k = \frac{n!}{k!(n-k)!}$$

(Newton binomiális képlete)

$$28) x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$$

$$29) (x + y + z)^3 = x^3 + y^3 + z^3 + 3(x+y)(y+z)(z+x)$$