CALCUL DE PUISSANCES

$\underbrace{a \times a \times \ldots \times a}_{n \text{ fois}} = a^n$

$3^3 = 3 \times 3 \times 3 = 27$
$(-3)^3 = (-3) \times (-3) \times (-3) = -27$

Règles de calcul

$a^0 = 1$

$a^{-n} = \frac{1}{a^n}$

$a^n \times a^p = a^{n+p}$

$\frac{a^n}{a^p} = a^{n-p}$

$(a^n)^p = a^{n \times p}$

$a^n \times b^n = (a \times b)^n$

$\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$

- $\frac{4^6}{4^8} = 4^{6-8} = 4^{-2} = \frac{1}{4^2} = \frac{1}{16}$
- $5^6 \times 5^{-7} \times 5^3 = 5^{6-7+3} = 5^2 = 25$
- $\frac{3^6}{3^{-7} \times 3^4} = \frac{3^6}{3^{-7+4}} = \frac{3^6}{3^{-3}} = 3^{6-(-3)} = 3^9$
- $\frac{5^7 \times 7^2}{7^{-7} \times 5^4} = \frac{5^7 \times 7^2}{5^4 \times 7^{-7}} = 5^{7-4} \times 7^{2-(-7)} = 5^3 \times 7^9$
- $\frac{21^2}{7^2} = \left(\frac{21}{7}\right)^2 = 3^2 = 9$

Écriture scientifique

$a \times 10^n$
avec
$1 \leq a < 10$

- $529\,804\,800\,000 = 5{,}298\,048 \times 10$
- $0{,}000\,000\,04 = 4{,}0 \times 10^{-8}$
- $\frac{3{,}45 \times 10^6}{7{,}09 \times 10^9} = \frac{3{,}45}{7{,}09} \times \frac{10^6}{10^9} \approx 0{,}49 \times 10^{-3}$
  $= 4{,}90 \times 10^{-2}$

CALCUL DE RACINES CARRÉS

Règles de calcul

$\sqrt{a^2} = a \quad (\sqrt{a})^2 = a$

$\sqrt{a \times b} = \sqrt{a} \times \sqrt{b}$

$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

$\sqrt{a \pm b} \neq \sqrt{a} \pm \sqrt{b}$

- $\sqrt{72} = \sqrt{36 \times 2} = \sqrt{36} \times \sqrt{2} = 6\sqrt{2}$
- $\sqrt{\frac{144}{100}} = \frac{\sqrt{144}}{\sqrt{100}} = \frac{12}{10} = \frac{6}{5}$
- $\sqrt{25 + 36} = \sqrt{61} \approx 7{,}8 \neq \sqrt{25} + \sqrt{36} = 11$