Puissances - Calculs

Puissances sur Minimaths.fr

Exercice 1 :

Donner le résultat des calculs suivants en écriture décimale.

a) $49{,}4 \times 10^{-1}$
b) $3{,}017 \times 10^{7}$
c) 8×10^{-3}
d) 25×10^{6}
e) 7×10^{2}
f) $877{,}804 \times 10^{2}$
g) $60{,}1 \times 10^{-7}$
h) 8×10^{-5}

Exercice 2 :

Écrire sous la forme 10^n.

a) $A = 10^{-5} \times 10^{-3}$
b) $B = 10^{4} \times 10^{-3}$
c) $C = 10^{8} \times 10^{6}$
d) $D = 10^{-6} \times 10^{-9}$
e) $E = 10^{8} \times 10^{-5}$
f) $F = 10^{5} \times 10^{9}$
g) $G = 10^{-4} \times 10^{-8}$
h) $H = 10^{-4} \times 10^{2}$

Exercice 3 :

Écrire sous la forme 10^n.

a) $A = \dfrac{10^{-5}}{10^{-9}}$
b) $B = \dfrac{10^{3}}{10^{-9}}$
c) $C = \dfrac{10^{9}}{10^{6}}$
d) $D = \dfrac{10^{-3}}{10^{-4}}$
e) $E = \dfrac{10^{-5}}{10^{7}}$
f) $F = \dfrac{10^{8}}{10^{3}}$
g) $G = \dfrac{10^{-5}}{10^{-6}}$
h) $H = \dfrac{10^{-3}}{10^{5}}$

Exercice 4 :

Écrire sous la forme 10^n.

a) $A = (10^{-2})^{-4}$
b) $B = (10^{2})^{-3}$
c) $C = (10^{3})^{4}$
d) $D = (10^{-3})^{-4}$
e) $E = (10^{2})^{-4}$
f) $F = (10^{2})^{4}$
g) $G = (10^{-4})^{-3}$
h) $H = (10^{-3})^{2}$

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Exercice 5 :

Écrire sous la forme 10^n.

a) $A = (10^{-3})^{-4}$

b) $B = 10^8 \times 10^{-2}$

c) $C = \dfrac{10^4}{10^3}$

d) $D = 10^{-9} \times 10^{-4}$

e) $E = \dfrac{10^{-7}}{10^3}$

f) $F = (10^2)^4$

g) $G = \dfrac{10^{-9}}{10^{-6}}$

h) $H = 10^4 \times 10^{-7}$

Exercice 6 :

Écrire sous la forme a^n.

a) $A = \dfrac{7^2 \times 49}{7^{-4} \times 7^4}$

b) $B = \dfrac{2^2 \times 4}{2^6 \times 2^{-5}}$

c) $C = \dfrac{7^3 \times 7^3}{7^{-2}}$

d) $D = \dfrac{6^{-5} \times 36}{6^3 \times 6^4}$

e) $E = \dfrac{6^{-3} \times 6^3}{6^3}$

f) $F = \dfrac{(-3)^{-4} \times (-3)^3}{(-3)^{-6}}$

g) $G = \dfrac{2^{-6} \times 4}{2^6 \times 2^{-5}}$

h) $H = \dfrac{5^4 \times 5^3}{5^{-8}}$

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Exercice 1 :

a) $49{,}4 \times 10^{-1} = \mathbf{4{,}94}$

b) $3{,}017 \times 10^{7} = \mathbf{30\,170\,000}$

c) $8 \times 10^{-3} = \mathbf{0{,}008}$

d) $25 \times 10^{6} = \mathbf{25\,000\,000}$

e) $7 \times 10^{2} = \mathbf{700}$

f) $877{,}804 \times 10^{2} = \mathbf{87\,780{,}4}$

g) $60{,}1 \times 10^{-7} = \mathbf{0{,}000\,006\,01}$

h) $8 \times 10^{-5} = \mathbf{0{,}000\,08}$

Exercice 2 :

a) $A = 10^{-5} \times 10^{-3}$

$A = \dfrac{1}{10^{5+3}} = \dfrac{1}{10^{8}} = \mathbf{10^{-8}}$

b) $B = 10^{4} \times 10^{-3}$

$B = \dfrac{10^{4}}{10^{3}} = 10^{4-3} = \mathbf{10^{1}}$

c) $C = 10^{8} \times 10^{6}$

$C = 10^{8+6} = \mathbf{10^{14}}$

d) $D = 10^{-6} \times 10^{-9}$

$D = \dfrac{1}{10^{6+9}} = \dfrac{1}{10^{15}} = \mathbf{10^{-15}}$

e) $E = 10^{8} \times 10^{-5}$

$E = \dfrac{10^{8}}{10^{5}} = 10^{8-5} = \mathbf{10^{3}}$

f) $F = 10^{5} \times 10^{9}$

$F = 10^{5+9} = \mathbf{10^{14}}$

g) $G = 10^{-4} \times 10^{-8}$

$G = \dfrac{1}{10^{4+8}} = \dfrac{1}{10^{12}} = \mathbf{10^{-12}}$

h) $H = 10^{-4} \times 10^{2}$

$H = \dfrac{10^{2}}{10^{4}} = \dfrac{1}{10^{4-2}} = \dfrac{1}{10^{2}} = \mathbf{10^{-2}}$

Exercice 3 :

a) $A = \dfrac{10^{-5}}{10^{-9}}$

$A = 10^{9-5} = \mathbf{10^{4}}$

b) $B = \dfrac{10^{3}}{10^{-9}}$

$B = 10^{3+9} = \mathbf{10^{12}}$

c) $C = \dfrac{10^{9}}{10^{6}}$

$C = 10^{9-6} = \mathbf{10^{3}}$

d) $D = \dfrac{10^{-3}}{10^{-4}}$

$D = 10^{4-3} = \mathbf{10^{1}}$

e) $E = \dfrac{10^{-5}}{10^{7}}$

$E = \dfrac{1}{10^{5+7}} = \dfrac{1}{10^{12}} = \mathbf{10^{-12}}$

f) $F = \dfrac{10^{8}}{10^{3}}$

$F = 10^{8-3} = \mathbf{10^{5}}$

g) $G = \dfrac{10^{-5}}{10^{-6}}$

$G = 10^{6-5} = \mathbf{10^{1}}$

h) $H = \dfrac{10^{-3}}{10^{5}}$

$H = \dfrac{1}{10^{3+5}} = \dfrac{1}{10^{8}} = \mathbf{10^{-8}}$

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Exercice 4 :

a) $A = (10^{-2})^{-4}$

$A = \dfrac{1}{(10^{-2})^4}$

$A = 10^{2\times 4} = \mathbf{10^{8}}$

b) $B = (10^{2})^{-3}$

$B = \dfrac{1}{(10^{2})^3}$

$B = \dfrac{1}{10^{2\times 3}} = \dfrac{1}{10^{6}} = \mathbf{10^{-6}}$

c) $C = (10^{3})^{4}$

$C = 10^{3\times 4} = \mathbf{10^{12}}$

d) $D = (10^{-3})^{-4}$

$D = \dfrac{1}{(10^{-3})^4}$

$D = 10^{3\times 4} = \mathbf{10^{12}}$

e) $E = (10^{2})^{-4}$

$E = \dfrac{1}{(10^{2})^4}$

$E = \dfrac{1}{10^{2\times 4}} = \dfrac{1}{10^{8}} = \mathbf{10^{-8}}$

f) $F = (10^{2})^{4}$

$F = 10^{2\times 4} = \mathbf{10^{8}}$

g) $G = (10^{-4})^{-3}$

$G = \dfrac{1}{(10^{-4})^3}$

$G = 10^{4\times 3} = \mathbf{10^{12}}$

h) $H = (10^{-3})^{2}$

$H = \dfrac{1}{10^{3\times 2}} = \dfrac{1}{10^{6}} = \mathbf{10^{-6}}$

Exercice 5 :

a) $A = (10^{-3})^{-4}$

$A = 10^{3\times 4} = \mathbf{10^{12}}$

b) $B = 10^{8} \times 10^{-2}$

$B = \dfrac{10^{8}}{10^{2}} = 10^{8-2} = \mathbf{10^{6}}$

c) $C = \dfrac{10^{4}}{10^{3}}$

$C = 10^{4-3} = \mathbf{10^{1}}$

d) $D = 10^{-9} \times 10^{-4}$

$D = \dfrac{1}{10^{9+4}} = \dfrac{1}{10^{13}} = \mathbf{10^{-13}}$

e) $E = \dfrac{10^{-7}}{10^{3}}$

$E = \dfrac{1}{10^{7+3}} = \dfrac{1}{10^{10}} = \mathbf{10^{-10}}$

f) $F = (10^{2})^{4}$

$F = 10^{2\times 4} = \mathbf{10^{8}}$

g) $G = \dfrac{10^{-9}}{10^{-6}}$

$G = \dfrac{1}{10^{9-6}} = \dfrac{1}{10^{3}} = \mathbf{10^{-3}}$

h) $H = 10^{4} \times 10^{-7}$

$H = \dfrac{10^{4}}{10^{7}} = \dfrac{1}{10^{7-4}} = \dfrac{1}{10^{3}} = \mathbf{10^{-3}}$

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Exercice 6 :

a)
$$\begin{aligned} A &= \frac{7^2 \times 49}{7^{-4} \times 7^4} \\ &= \frac{7^2 \times 7^2}{7^{-4} \times 7^4} \\ &= \frac{7^{2+2}}{7^{-4+4}} \\ &= \frac{7^4}{7^0} \\ &= 7^{4-0} \\ &= \mathbf{7^4} \end{aligned}$$

b)
$$\begin{aligned} B &= \frac{2^2 \times 4}{2^6 \times 2^{-5}} \\ &= \frac{2^2 \times 2^2}{2^6 \times 2^{-5}} \\ &= \frac{2^{2+2}}{2^{6+(-5)}} \\ &= \frac{2^4}{2^1} \\ &= 2^{4-1} \\ &= \mathbf{2^3} \end{aligned}$$

c)
$$\begin{aligned} C &= \frac{7^3 \times 7^3}{7^{-2}} \\ &= \frac{7^{3+3}}{7^{-2}} \\ &= \frac{7^6}{7^{-2}} \\ &= 7^{6-(-2)} \\ &= \mathbf{7^8} \end{aligned}$$

d)
$$\begin{aligned} D &= \frac{6^{-5} \times 36}{6^3 \times 6^4} \\ &= \frac{6^{-5} \times 6^2}{6^3 \times 6^4} \\ &= \frac{6^{-5+2}}{6^{3+4}} \\ &= \frac{6^{-3}}{6^7} \\ &= 6^{-3-7} \\ &= \mathbf{6^{-10}} \end{aligned}$$

e)
$$\begin{aligned} E &= \frac{6^{-3} \times 6^3}{6^3} \\ &= \frac{6^{-3+3}}{6^3} \\ &= \frac{6^0}{6^3} \\ &= 6^{0-3} \\ &= \mathbf{6^{-3}} \end{aligned}$$

f)
$$\begin{aligned} F &= \frac{(-3)^{-4} \times (-3)^3}{(-3)^{-6}} \\ &= \frac{(-3)^{-4+3}}{(-3)^{-6}} \\ &= \frac{(-3)^{-1}}{(-3)^{-6}} \\ &= (-3)^{-1-(-6)} \\ &= \mathbf{(-3)^5} \end{aligned}$$

g)
$$\begin{aligned} G &= \frac{2^{-6} \times 4}{2^6 \times 2^{-5}} \\ &= \frac{2^{-6} \times 2^2}{2^6 \times 2^{-5}} \\ &= \frac{2^{-6+2}}{2^{6+(-5)}} \\ &= \frac{2^{-4}}{2^1} \\ &= 2^{-4-1} \\ &= \mathbf{2^{-5}} \end{aligned}$$

h)
$$\begin{aligned} H &= \frac{5^4 \times 5^3}{5^{-8}} \\ &= \frac{5^{4+3}}{5^{-8}} \\ &= \frac{5^7}{5^{-8}} \\ &= 5^{7-(-8)} \\ &= \mathbf{5^{15}} \end{aligned}$$