Calcul algébrique

Correction de l'exercice 1

1.

$$\begin{aligned} A &= \frac{10^3 \times (10^2)^3 + 10^7}{10^2 \times 10^4} \\ &= \frac{10^3 \times 10^6 + 10^7}{10^6} \\ &= \frac{10^9 + 10^7}{10^6} \\ &= \frac{10^9}{10^6} + \frac{10^7}{10^6} \\ &= 10^3 + 10 \\ &= 1010 \end{aligned}$$

2.

$$\begin{aligned} B &= \frac{10^{-2} \times (10^2)^4 + 10^7}{10 \times 10^4} \\ &= \frac{10^{-2} \times 10^8 + 10^7}{10^5} \\ &= \frac{10^6 + 10^7}{10^5} \\ &= \frac{10^6}{10^5} + \frac{10^7}{10^5} \\ &= 10 + 10^2 \\ &= 110 \end{aligned}$$

3.

$$\begin{aligned} C &= \frac{10 + 10 \times 10^3}{10^3} \\ &= \frac{10}{10^3} + \frac{10^4}{10^3} \\ &= 10^{-2} + 10 \\ &= 0,01 + 10 \\ &= 10,01 \end{aligned}$$

Correction de l'exercice 2

1.

$$\begin{aligned} A &= \frac{10^2 \times (10^3)^4 + 10^8}{(10^4)^2} \\ &= \frac{10^2 \times 10^{12} + 10^8}{10^8} \\ &= \frac{10^{14} + 10^8}{10^8} \\ &= \frac{10^{14}}{10^8} + \frac{10^8}{10^8} \\ &= 10^6 + 1 \\ &= 1000000 + 1 \\ &= 1000001 \end{aligned}$$

2.

$$\begin{aligned} B &= \frac{10^{-2} \times (10^{-1})^3 + 10^{-5}}{10 \times 10^{-6}} \\ &= \frac{10^{-2} \times 10^{-3} + 10^{-5}}{10^{-5}} \\ &= \frac{10^{-5} + 10^{-5}}{10^{-5}} \\ &= \frac{2 \times 10^{-5}}{10^{-5}} \\ &= 2 \end{aligned}$$

3.

$$\begin{aligned} C &= \frac{10^{-2} + 10 \times 10^3}{10^{-3}} \\ &= \frac{10^{-2} + 10^4}{10^{-3}} \\ &= \frac{10^{-2}}{10^{-3}} + \frac{10^4}{10^{-3}} \\ &= 10 + 10^7 \\ &= 10000010 \end{aligned}$$

Correction de l'exercice 3

1.

$$\begin{aligned}
A &= \frac{10^2 \times (10^2)^{-2} + 10^3}{10^2 \times 10} \\
&= \frac{10^2 \times 10^{-4} + 10^3}{10^3} \\
&= \frac{10^{-2} + 10^3}{10^3} \\
&= \frac{10^{-2}}{10^3} + \frac{10^3}{10^3} \\
&= 10^{-5} + 1 \\
&= 1,00001
\end{aligned}$$

2.

$$\begin{aligned}
B &= \frac{10^2 \times (10^2)^3 - 10^6}{(10^2)^4} \\
&= \frac{10^2 \times 10^6 - 10^6}{10^8} \\
&= \frac{10^8 - 10^6}{10^8} \\
&= \frac{10^8}{10^8} - \frac{10^6}{10^8} \\
&= 1 - 10^{-2} \\
&= 1 - 0,01 \\
&= 0,99
\end{aligned}$$

3.

$$\begin{aligned}
C &= \frac{10 - 10^{-3} \times 10^3}{10^3} \\
&= \frac{10 - 10^0}{10^3} \\
&= \frac{10 - 1}{10^3} \\
&= \frac{9}{10^3} \\
&= 9 \times 10^{-3} \\
&= 0,009
\end{aligned}$$

Correction de l'exercice 4

1.

$$\begin{aligned}
A &= \frac{2 \times (10^3)^2 \times 10^{-2} + 3 \times 10}{10^2 \times 10} \\
&= \frac{2 \times 10^6 \times 10^{-2} + 3 \times 10}{10^3} \\
&= \frac{2 \times 10^4 + 3 \times 10}{10^3} \\
&= \frac{2 \times 10^4}{10^3} + \frac{3 \times 10}{10^3} \\
&= 2 \times 10 + 3 \times 10^{-2} \\
&= 20 + 0,03
\end{aligned}$$

2.

$$\begin{aligned}
B &= \frac{5 + 2 \times (10^3 \times 10^{-2})^2}{10 \times 10^3} \\
&= \frac{5 + 2 \times 10^2}{10^4} \\
&= \frac{5}{10^4} + \frac{2 \times 10^2}{10^4} \\
&= 5 \times 10^{-4} + 2 \times 10^{-2} \\
&= 0,0005 + 0,02 \\
&= 0,0205
\end{aligned}$$

3.

$$\begin{aligned}
C &= \frac{3 + 20 \times 10^{-3}}{(10^2)^2} \\
&= \frac{3 + 2 \times 10^{-2}}{10^4} \\
&= \frac{3}{10^4} + 2 \times 10^{-6} \\
&= 3 \times 10^{-4} + 2 \times 10^{-6} \\
&= 0,0003 + 0,000002 \\
&= 0,000302
\end{aligned}$$

Correction de l'exercice 5

1.

$$\begin{aligned}
A &= \frac{2 \times (10^2)^2 \times 10^{-4} + 5 \times 10^3}{10^{-3} \times 10} \\
&= \frac{2 \times 10^4 \times 10^{-4} + 5 \times 10^3}{10^{-2}} \\
&= \frac{2 \times 10^0 + 5 \times 10^3}{10^{-2}} \\
&= \frac{2 + 5 \times 10^3}{10^{-2}} \\
&= \frac{2}{10^{-2}} + \frac{5 \times 10^3}{10^{-2}} \\
&= 2 \times 10^2 + 5 \times 10^5 \\
&= 200 + 500000 \\
&= 500200
\end{aligned}$$

2.

$$\begin{aligned}
B &= \frac{45 \times 10^2 + 5 \times (10^3)^2}{10^6 \times 10^{-2}} \\
&= \frac{45 \times 10^2 + 5 \times 10^6}{10^4} \\
&= 45 \times 10^{-2} + 5 \times 10^2 \\
&= 0,45 + 500 \\
&= 500,45
\end{aligned}$$

3.

$$\begin{aligned}
C &= \frac{120 \times 10^3 + 2 \times 10 \times 10^4}{10^3} \\
&= \frac{120 \times 10^3 + 2 \times 10^5}{10^3} \\
&= 120 + 2 \times 10^2 \\
&= 120 + 200 \\
&= 320
\end{aligned}$$