Calcul littéral - Solutions

2nd – septembre 2022

Exercice 4 — Solution — Réduire - technique

1.

$$\begin{aligned} A &= -6x - 7 + 10x + 3 \\ &= -6x - 7 + 10x + 3 \\ &= -6x + 10x - 7 + 3 \\ &= (-6 + 10) \times x - 4 \\ &= 4x - 4 \end{aligned}$$

2.

$$\begin{aligned} B &= -4t - 3 - 10t - 7t \\ &= -4t - 3 + (-10 - 7) \times t \\ &= -4t - 3 - 17t \\ &= -4t - 17t - 3 \\ &= (-4 - 17) \times t - 3 \\ &= -21t - 3 \end{aligned}$$

3.

$$\begin{aligned} C &= -8t - 4 - 3t + 8t \\ &= -8t - 4 + (-3 + 8) \times t \\ &= -8t - 4 + 5t \\ &= -8t + 5t - 4 \\ &= (-8 + 5) \times t - 4 \\ &= -3t - 4 \end{aligned}$$

4.

$$\begin{aligned} D &= 4x + 5 - 4x - 9 \\ &= 4x + 5 - 4x - 9 \\ &= 4x - 4x + 5 - 9 \\ &= (4 - 4) \times x - 4 \\ &= 0x - 4 \\ &= -4 \end{aligned}$$

5.

$$\begin{aligned} E &= -7t + 9 + 2t - 9 - 4t \\ &= -7t + 9 + (2 - 4) \times t - 9 \\ &= -7t + 9 - 9 - 2t \\ &= (-7 - 2) \times t + 0 \\ &= -9t \end{aligned}$$

6.

$$\begin{aligned} F &= \frac{-9}{9} + 9a + 4a + 8 \\ &= 9a + \frac{-9}{9} + 4a + 8 \\ &= 9a + 4a + \frac{-9}{9} + 8 \\ &= (9 + 4) \times a + \frac{-9}{9} + \frac{8}{1} \\ &= 13a + \frac{-9}{9} + \frac{8 \times 9}{1 \times 9} \\ &= 13a + \frac{-9}{9} + \frac{72}{9} \\ &= 13a + \frac{-9}{9} + \frac{72}{9} \\ &= 13a + \frac{-9 + 72}{9} \\ &= 13a + \frac{63}{9} \end{aligned}$$

7.

$$\begin{aligned} G &= 6x^2 + 4 - 2x^2 + 4 - 5x^2 \\ &= 6x^2 + 4 + (-2 - 5) \times x^2 + 4 \\ &= 6x^2 + 4 + 4 - 7x^2 \\ &= (6 - 7) \times x^2 + 8 \\ &= -x^2 + 8 \end{aligned}$$

8.

$$\begin{aligned} H &= -9x - 10 - 3x^2 + 5 - 4x^2 \\ &= -3x^2 - 9x - 10 + 5 - 4x^2 \\ &= -3x^2 - 4x^2 - 9x - 10 + 5 \\ &= (-3 - 4) \times x^2 - 9x - 5 \\ &= -7x^2 - 9x - 5 \end{aligned}$$

9.

$$\begin{aligned} I &= -9x - 5 + 7x^2 + 9x + 9x^2 \\ &= 7x^2 - 9x - 5 + 9x + 9x^2 \\ &= 7x^2 + 9x^2 - 9x + 9x - 5 \\ &= (7 + 9) \times x^2 + (-9 + 9) \times x - 5 \\ &= 16x^2 - 5 \end{aligned}$$

Exercice 5 — Solution — Développer 1 - technique

1.

$$\begin{aligned} A &= -6(3x - 7) \\ &= -6 \times 3x - 6(-7) \\ &= -6 \times 3 \times x + 42 \\ &= -18x + 42 \end{aligned}$$

2.

$$\begin{aligned} B &= -6(-7 + 3t) \\ &= -6 \times 3t - 6(-7) \\ &= -6 \times 3 \times t + 42 \\ &= -18t + 42 \end{aligned}$$

3.

$$\begin{aligned} C &= t(7 - 5t) \\ &= t \times -5t + t \times 7 \\ &= -5t^2 + 7t \end{aligned}$$

4.

$$\begin{aligned} D &= 10x(4x + 7) \\ &= 10x \times 4x + 10x \times 7 \\ &= 10 \times 4 \times x^{1+1} + 7 \times 10 \times x \\ &= 40x^2 + 70x \end{aligned}$$

5.

$$\begin{aligned} E &= -3x(-5x - 4) \\ &= -3x \times -5x - 3x(-4) \\ &= -3(-5) \times x^{1+1} - 4(-3) \times x \\ &= 15x^2 + 12x \end{aligned}$$

6.

$$\begin{aligned} F &= \frac{2}{10} \times x(2x + 9) \\ &= \frac{2}{10} \times x \times 2x + \frac{2}{10} \times x \times 9 \\ &= \frac{2}{10} \times 2 \times x^{1+1} + 9 \times \frac{2}{10} \times x \\ &= \frac{2 \times 2}{10} \times x^2 + \frac{9 \times 2}{10} \times x \\ &= \frac{4}{10} \times x^2 + \frac{18}{10} \times x \end{aligned}$$

Exercice 6 — Solution — Développer 2 - technique

1.

$$
\begin{aligned}
A &= (-10x - 9)(3x - 5) \\
&= -10x \times 3x - 10x(-5) - 9 \times 3x - 9(-5) \\
&= -10 \times 3 \times x^{1+1} - 5(-10) \times x - 9 \times 3 \times x + 45 \\
&= 50x - 27x - 30x^2 + 45 \\
&= (50 - 27) \times x - 30x^2 + 45 \\
&= -30x^2 + 23x + 45
\end{aligned}
$$

2.

$$
\begin{aligned}
B &= (8t - 6)(4t - 2) \\
&= 8t \times 4t + 8t(-2) - 6 \times 4t - 6(-2) \\
&= 8 \times 4 \times t^{1+1} - 2 \times 8 \times t - 6 \times 4 \times t + 12 \\
&= -16t - 24t + 32t^2 + 12 \\
&= (-16 - 24) \times t + 32t^2 + 12 \\
&= 32t^2 - 40t + 12
\end{aligned}
$$

3.

$$
\begin{aligned}
C &= (2x + 6)(-6x - 7) \\
&= 2x \times -6x + 2x(-7) + 6 \times -6x + 6(-7) \\
&= 2(-6) \times x^{1+1} - 7 \times 2 \times x + 6(-6) \times x - 42 \\
&= -14x - 36x - 12x^2 - 42 \\
&= (-14 - 36) \times x - 12x^2 - 42 \\
&= -12x^2 - 50x - 42
\end{aligned}
$$

4.

$$
\begin{aligned}
D &= (2x - 9)(2x + 8) \\
&= 2x \times 2x + 2x \times 8 - 9 \times 2x - 9 \times 8 \\
&= 2 \times 2 \times x^{1+1} + 8 \times 2 \times x - 9 \times 2 \times x - 72 \\
&= 16x - 18x + 4x^2 - 72 \\
&= (16 - 18) \times x + 4x^2 - 72 \\
&= 4x^2 - 2x - 72
\end{aligned}
$$

5.

$$
\begin{aligned}
E &= (-3x + 2)^2 \\
&= (-3x + 2)(-3x + 2) \\
&= -3x \times -3x - 3x \times 2 + 2 \times -3x + 2 \times 2 \\
&= -3(-3) \times x^{1+1} + 2(-3) \times x + 2(-3) \times x + 4 \\
&= -6x - 6x + 9x^2 + 4 \\
&= (-6 - 6) \times x + 9x^2 + 4 \\
&= 9x^2 - 12x + 4
\end{aligned}
$$

6.

$$
\begin{aligned}
F &= (8x + 5)^2 \\
&= (8x + 5)(8x + 5) \\
&= 8x \times 8x + 8x \times 5 + 5 \times 8x + 5 \times 5 \\
&= 8 \times 8 \times x^{1+1} + 5 \times 8 \times x + 5 \times 8 \times x + 25 \\
&= 40x + 40x + 64x^2 + 25 \\
&= (40 + 40) \times x + 64x^2 + 25 \\
&= 64x^2 + 80x + 25
\end{aligned}
$$

7.

$$
\begin{aligned}
G &= (8x + 5)^2 \\
&= (8x + 5)(8x + 5) \\
&= 8x \times 8x + 8x \times 5 + 5 \times 8x + 5 \times 5 \\
&= 8 \times 8 \times x^{1+1} + 5 \times 8 \times x + 5 \times 8 \times x + 25 \\
&= 40x + 40x + 64x^2 + 25 \\
&= (40 + 40) \times x + 64x^2 + 25 \\
&= 64x^2 + 80x + 25
\end{aligned}
$$

8.

$$
\begin{aligned}
H &= (\frac{10}{7} \times x - 10)^2 \\
&= (\frac{10}{7} \times x - 10)(\frac{10}{7} \times x - 10) \\
&= \frac{10}{7} \times x \times \frac{10}{7} \times x + \frac{10}{7} \times x(-10) - 10 \times \frac{10}{7} \times x - 10(-10) \\
&= \frac{10}{7} \times \frac{10}{7} \times x^{1+1} - 10 \times \frac{10}{7} \times x - 10 \times \frac{10}{7} \times x + 100 \\
&= \frac{-10 \times 10}{7} \times x + \frac{-10 \times 10}{7} \times x + \frac{10 \times 10}{7 \times 7} \times x^2 + 100 \\
&= \frac{-100}{7} \times x + \frac{100}{49} \times x^2 + \frac{-100}{7} \times x + 100 \\
&= 100 + \frac{100}{49} \times x^2 + \frac{-100}{7} \times x + \frac{-100}{7} \times x \\
&= 100 + \frac{100}{49} \times x^2 + (\frac{-100}{7} + \frac{-100}{7}) \times x \\
&= 100 + \frac{100}{49} \times x^2 + \frac{-100 - 100}{7} \times x \\
&= \frac{100}{49} \times x^2 + \frac{-200}{7} \times x + 100
\end{aligned}
$$