

**Exercice N°1 :**

$$A = 7a + 21 = 7 \times a + 7 \times 3 = 7(a + 3)$$

$$B = 14a - 35 = 7 \times 2a - 7 \times 5 = 7(2a - 5)$$

$$C = 10x + 5 = 5 \times 2x + 5 \times 1 = 5(2x + 1)$$

**Remarque :** il ne faut surtout pas oublié le 1.

$$D = 27x - 36 = 9 \times 3x - 9 \times 4 = 9(3x - 4)$$

**Exercice N°2 :**

$$A = a^2 + 2a = a \times a + a \times 2 = a(a + 2)$$

$$B = 3a^2 - 6a = 3a \times a - 3a \times 2 = 3a(a - 2)$$

$$C = 12x^2 - 14x = 2x \times 6x - 2x \times 7 = 2x(6x - 7)$$

$$D = 27x^4 - 18x^3 - 15x^2 = 3x^2 \times 9x^2 - 3x^2 \times 6x - 3x^2 \times 5 = 3x^2(9x^2 - 6x - 5)$$

**Exercice N°3 :**

$$\begin{aligned} A &= 5(x + 1) + x(x + 1) \\ &= (x + 1)(5 + x) \end{aligned}$$

$$\begin{aligned} B &= (x - 1)(2x + 3) + (x - 1)(5x - 2) \\ &= (x - 1)[(2x + 3) + (5x - 2)] \\ &= (x - 1)(2x + 3 + 5x - 2) \\ &= (x - 1)(7x + 1) \end{aligned}$$

$$\begin{aligned} C &= (2x - 5)(4x - 3) - (2x - 5)(3x - 1) \\ &= (2x - 5)[(4x - 3) - (3x - 1)] \\ &= (2x - 5)(4x - 3 - 3x + 1) \\ &= (2x - 5)(x - 2) \end{aligned}$$

$$\begin{aligned} D &= 2(3x - 1)(x + 3) - 3(x + 3)(4x + 1) \\ &= (x + 3)[2(3x - 1) - 3(4x + 1)] \\ &= (x + 3)(6x - 2 - 12x - 3) \\ &= (x + 3)(-6x - 5) \end{aligned}$$

**Remarque :** Attention à la gestion des signes dans le crochet

$$\begin{aligned} E &= 7(x - 7) - x(x - 7) + 4(x - 7) \\ &= (x - 7)(7 - x + 4) \\ &= (x - 7)(11 - x) \end{aligned}$$

$$\begin{aligned}
F &= (2x + 5)(3x - 7) - (2x + 5)(5x - 3) \\
&= (2x + 5)[(3x - 7) - (5x - 3)] \\
&= (2x + 5)(3x - 7 - 5x + 3) \\
&= (2x + 5)(-2x - 4) \quad (*) \\
&= (2x + 5)[-2(x + 2)] \\
&= -2(2x + 5)(x + 2)
\end{aligned}$$

**Remarque :** La forme attendue est (\*). Trouver la dernière est parfait ;).

$$\begin{aligned}
G &= (5x + 7)(x - 1) + (x - 1)(3x - 4) \\
&= (x - 1)[(5x + 7) + (3x - 4)] \\
&= (x - 1)(5x + 7 + 3x - 4) \\
&= (x - 1)(8x + 3)
\end{aligned}$$

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

$$\begin{aligned}
I &= (x + 7)(5x + 2) - 3(5x + 2)^2 \\
&= (x + 7)(5x + 2) - 3(5x + 2)(5x + 2) \\
&= (5x + 2)[(x + 7) - 3(5x + 2)] \\
&= (5x + 2)(x + 7 - 15x - 6) \\
&= (5x + 2)(-14x + 1)
\end{aligned}$$

$$\begin{aligned}
J &= (3x - 4)(2x + 3) - (2x - 3)(3x - 4) \\
&= (3x - 4)[(2x + 3) - (2x - 3)] \\
&= (3x - 4)(2x + 3 - 2x + 3) \\
&= (3x - 4) \times 6 \\
&= 6(3x - 4)
\end{aligned}$$

**Exercice N°4 :**

$$\begin{aligned}
A &= (5x - 2) + 4(2x + 1)(5x - 2) \\
&= (5x - 2) \times 1 + 4(2x + 1)(5x - 2) \\
&= (5x - 2)[1 + 4(2x + 1)] \\
&= (5x - 2)(1 + 8x + 4) \\
&= (5x - 2)(5 + 8x)
\end{aligned}$$

$$\begin{aligned}
B &= 7x(2x + 3) + 2x + 3 \\
&= 7x(2x + 3) + (2x + 3) \times 1 \\
&= (2x + 3)(7x + 1)
\end{aligned}$$

$$\begin{aligned}
C &= (3x + 5)(x - 1) + (x - 1) \\
&= (3x + 5)(x - 1) + (x - 1) \times 1 \\
&= (x - 1) [(3x + 5) + 1] \\
&= (x - 1)(3x + 5 + 1) \\
&= (x - 1)(3x + 6) \quad \text{forme attendue} \\
&= (x - 1)(3x + 3 \times 2) \\
&= 3(x - 1)(x + 2) \quad \text{forme espérée}
\end{aligned}$$

$$\begin{aligned}
D &= (7x - 2)(3x + 4) - (3x + 4) \\
&= (7x - 2)(3x + 4) - (3x + 4) \times 1 \\
&= (3x + 4) [(7x - 2) - 1] \\
&= (3x + 4)(7x - 2 - 1) \\
&= (3x + 4)(7x - 3)
\end{aligned}$$

$$\begin{aligned}
E &= (5x - 1)(2x + 3) - 5x + 1 \\
&= (5x - 1)(2x + 3) - (5x - 1) \\
&= (5x - 1)(2x + 3) - (5x - 1) \times 1 \\
&= (5x - 1) [(2x + 3) - 1] \\
&= (5x - 1)(2x + 3 - 1) \\
&= (5x - 1)(2x + 2) \quad \text{forme attendue} \\
&= 2(5x - 1)(x + 1) \quad \text{forme espérée}
\end{aligned}$$

$$\begin{aligned}
F &= (7x - 2)(x - 9) + 14x - 4 \\
&= (7x - 2)(x - 9) + 2(7x - 2) \\
&= (7x - 2) [(x - 9) + 2] \\
&= (7x - 2)(x - 9 + 2) \\
&= (7x - 2)(x - 7)
\end{aligned}$$

$$\begin{aligned}
G &= (x + 4)^2 + (x - 4)(x + 4) + 2x + 8 \\
&= (x + 4)(x + 4) + (x - 4)(x + 4) + 2(x + 4) \\
&= (x + 4) [(x + 4) + (x - 4) + 2] \\
&= (x + 4)(x + 4 + x - 4 + 2) \\
&= (x + 4)(2x + 2) \quad \text{forme attendue} \\
&= 2(x + 4)(x + 1) \quad \text{forme espérée}
\end{aligned}$$

$$\begin{aligned}
H &= (2x + 6)(x - 5) + 3x + 9 \\
&= 2(x + 3)(x - 5) + 3(x + 3) \\
&= (x + 3) [2(x - 5) + 3] \\
&= (x + 3)(2x - 10 + 3) \\
&= (x + 3)(2x - 7)
\end{aligned}$$

**Exercice N°5 :**

$$\begin{aligned}A &= 2(1 - 6x)(x + 1) - 3(2x - 1)(1 - 6x) \\ &= (1 - 6x)[2(x + 1) - 3(2x - 1)] \\ &= (1 - 6x)(2x + 2 - 6x + 3) \\ &= (1 - 6x)(-4x + 5)\end{aligned}$$

$$\begin{aligned}B &= (5x + 2)(3x - 4) - (3x - 4) \\ &= (5x + 2)(3x - 4) - (3x - 4) \times 1 \\ &= (3x - 4)[(5x + 2) - 1] \\ &= (3x - 4)(5x + 2 - 1) \\ &= (3x - 4)(5x + 1)\end{aligned}$$

$$\begin{aligned}C &= (2x - 1)(3x + 2) - 4x(2x - 1) \\ &= (2x - 1)[(3x + 2) - 4x] \\ &= (2x - 1)(3x + 2 - 4x) \\ &= (2x - 1)(2 - x)\end{aligned}$$

$$\begin{aligned}D &= 3(3x + 4)(2x + 3) - 2(3x + 4)(5 - 6x) \\ &= (3x + 4)[(3(2x + 3) - 2(5 - 6x))] \\ &= (3x + 4)(6x + 9 - 10 + 12x) \\ &= (3x + 4)(18x - 1)\end{aligned}$$