Série N°9 : 2nde

Factorisation

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Exercice N°1 :

Factoriser les expressions suivantes :

$A = 7a + 21$

$B = 14a - 35$

$C = 10x + 5$

$D = 27x - 36$

Exercice N°2 :

Factoriser les expressions suivantes :

$A = a^2 + 2a$

$B = 3a^2 - 6a$

$C = 12x^2 - 14x$

$D = 27x^4 - 18x^3 - 15x^2$

Exercice N°3 :

Factoriser

$A = 5(x+1) + x(x+1)$

$B = (x-1)(2x+3) + (x-1)(5x-2)$

$C = (2x-5)(4x-3) - (2x-5)(3x-1)$

$D = 2(3x-1)(x+3) - 3(x+3)(4x+1)$

$E = 7(x-7) - x(x-7) + 4(x-7)$

$F = (2x+5)(3x-7) - (2x+5)(5x-3)$

$G = (5x+7)(x-1) + (x-1)(3x-4)$

$H = (3x-2)(x-5) + (x-5)^2$

$I = (x+7)(5x+2) - 3(5x+2)^2$

$J = (3x-4)(2x+3) - (2x-3)(3x-4)$

Exercice N°4 :

Factoriser

$A = (5x-2) + 4(2x+1)(5x-2)$

$B = 7x(2x+3) + 2x + 3$

$C = (3x+5)(x-1) + (x-1)$

$D = (7x-2)(3x+4) - (3x+4)$

$E = (5x-1)(2x+3) - 5x + 1$

$F = (7x-2)(x-9) + 14x - 4$

$G = (x+4)^2 + (x-4)(x+4) + 2x + 8$

$H = (2x+6)(x-5) + 3x + 9$

Corrigé : Factorisation

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 :

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

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

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

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

Exercice N°3 :

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

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

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

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

Remarque : Attention à la gestion des signes dans le crochet

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

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

Remarque : La forme attendue est $(*)$. Trouver la dernière est parfai

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

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

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

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

Exercice N°4 :

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

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

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

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

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

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