INTERRO DE COURS – SEMAINE 2

Exercice 1 – Développer, réduire et ordonner les expressions suivantes.

1. $A(x) = (4x-1)(-2x+3)$

Solution :

$$\begin{aligned} A(x) &= (4x-1)(-2x+3) \\ &= -8x^2 + 12x + 2x - 3 \\ &= -8x^2 + 14x - 3 \end{aligned}$$

2. $B(x) = (5x-2)^2$

Solution :

$$\begin{aligned} B(x) &= (5x-2)^2 \\ &= (5x)^2 - 2 \times (5x) \times 2 + 2^2 \\ &= 25x^2 - 20x + 4 \end{aligned}$$

3. $C(x) = (2x+3)^2 - (2x-1)(x-4)$

Solution :

$$\begin{aligned} C(x) &= (2x+3)^2 - (2x-1)(x-4) \\ &= (2x)^2 + 2 \times (2x) \times 3 + 3^2 - \left(2x^2 - 8x - x + 4\right) \\ &= 4x^2 + 12x + 9 - \left(2x^2 - 9x + 4\right) \\ &= 4x^2 + 12x + 9 - 2x^2 + 9x - 4 \\ &= 2x^2 + 21x + 5 \end{aligned}$$

Exercice 2 – Factoriser au maximum les expressions données.

1. $A(x) = (2x+3)(4x-3) + (2x+3)^2$

Solution :

$$\begin{aligned} A(x) &= (2x+3)(4x-3) + (2x+3)^2 \\ &= (2x+3)(4x-3) + (2x+3)(2x+3) \\ &= (2x+3)\left(4x-3+2x+3\right) \\ &= (2x+3) \times 6x \\ &= 6x(2x+3) \end{aligned}$$

2. $B(x) = 4x^2 + 8x$

Solution :

$$\begin{aligned} B(x) &= 4x^2 + 8x \\ &= 4x \times x + 4x \times 2 \\ &= 4x(x+2) \end{aligned}$$

3. $C(x) = 4x^2 - 12x + 9$

Solution :

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

4. $D(x) = (x-1)^2 - (4x-2)^2$

Solution :

$$\begin{aligned} D(x) &= (x-1)^2 - (4x-2)^2 \\ &= ((x-1) - (4x-2))\,((x-1) + (4x-2)) \\ &= (x-1-4x+2)\,(x-1+4x-2) \\ &= (-3x+1)(5x-3) \end{aligned}$$

Exercice 3 – Résoudre les équations suivantes.

1. $-x + 4 = 12$

Solution : $-x + 4 = 12 \iff -x = 8 \iff x = -8$ donc $\mathscr{S} = \{-8\}$

2. $3x - 5 = 0$

Solution : $3x - 5 = 0 \iff 3x = 5 \iff x = \dfrac{5}{3}$ donc $\mathscr{S} = \left\{\dfrac{5}{3}\right\}$

3. $2x - 4 = 3x + \dfrac{1}{2}$

Solution : $2x-4 = 3x+\dfrac{1}{2} \iff 2x-3x = \dfrac{1}{2}+4 \iff -x = \dfrac{9}{2} \iff x = \dfrac{-9}{2}$ donc $\mathscr{S} = \left\{\dfrac{-9}{2}\right\}$

4. $17x + 4 = 24x + 1$

Solution : $17x + 4 = 24x + 1 \iff 17x - 24x = 1 - 4 \iff -7x = -3 \iff x = \dfrac{-7}{-3} = \dfrac{7}{3}$
donc $\mathscr{S} = \left\{\dfrac{7}{3}\right\}$