

Example 19

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

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

$$\begin{aligned} &\textcircled{3 \times 5} \times 8 \\ &15 \times 8 = 120 \end{aligned}$$

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

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

$$(a+b)^2 = a^2 + 2ab + b^2 \quad \begin{matrix} a=5x \\ b=1 \end{matrix}$$

$$5x \times 5x = 25x^2$$

$$\begin{aligned} &= (5x)^2 + 2 \times 5x \times 1 + 1^2 - 3(x^2 + 2 \times x \times 3 + 3^2) \\ &= 25x^2 + 10x + 1 - 3(x^2 + 6x + 9) \\ &= 25x^2 + 10x + 1 - 3x^2 - 18x - 27 \\ &= 22x^2 - 8x - 26 \end{aligned}$$

$$7) G(x,y) = (3x-2y)^2 - 5(x+3y)^2$$

$$\begin{aligned} &= (3x)^2 - 2 \times 3x \times 2y + (2y)^2 - 5(x^2 + 2 \times x \times 3y + (3y)^2) \\ &= 9x^2 - 12xy + 4y^2 - 5(x^2 + 6xy + 9y^2) \\ &= 9x^2 - 12xy + 4y^2 - 5x^2 - 30xy - 45y^2 \\ &= 4x^2 - 42xy - 41y^2 \end{aligned}$$

Exemple 20

$$A \times B + A \times C = A(B + C)$$

développe
factorise

$$\begin{aligned} A(x) &= \underbrace{(x+1)}_A \underbrace{(x-3)}_B - \underbrace{2}_C \underbrace{(x+1)}_A \\ &= (x+1)((x-3)-2) \\ &= (x+1)(x-3-2) \\ &= (x+1)(x-5) \end{aligned}$$

3] $C(x) = (1-2x)^2 - x^2$

$A^2 - B^2$ avec $A = 1-2x$
 $B = x$

$$\begin{aligned}
 A^2 - B^2 &= (A - B)(A + B) \\
 &= (1 - 2x - x)(1 - 2x + x) \\
 &= (1 - 3x)(1 - x)
 \end{aligned}$$

$$\begin{aligned}
 5] \quad E(x) &= 4x^2 - 8x + 4 - (x+7)^2 \\
 &= (2x-2)^2 - (x+7)^2 \\
 &\quad A^2 - B^2 \\
 &= ((2x-2) - (x+7))((2x-2) + (x+7)) \\
 &= (2x-2-x-7)(2x-2+x+7) \\
 &= (x-9)(3x+5)
 \end{aligned}$$

$$\begin{aligned}
 7] \quad G(x) &= (2x-3)^2 - (2x-3) \\
 &\quad A^2 - A = A(A-1) \\
 &= (2x-3)((2x-3)-1) \\
 &= (2x-3)(2x-4)
 \end{aligned}$$

Exemple 21

$$1) A(x) = \frac{1}{x-1} - \frac{1}{x+3}$$

$$= \frac{1 \times (x+3)}{(x-1)(x+3)} - \frac{1 \times (x-1)}{(x+3)(x-1)}$$

$$= \frac{x+3}{(x-1)(x+3)} - \frac{x-1}{(x+3)(x-1)}$$

$$= \frac{x+3 - (x-1)}{(x-1)(x+3)}$$

$$= \frac{x+3 - x + 1}{(x-1)(x+3)} = \frac{4}{(x-1)(x+3)}$$

$$3) C(x) = \frac{5}{x} + \frac{7}{2x+1}$$

$$= \frac{5(2x+1) + 7x}{x(2x+1)} = \frac{17x+5}{x(2x+1)}$$

$$5) E(x) = \frac{3}{x-1} + \frac{5x}{x+1} - \frac{3x+1}{x^2-1} + 2$$

$$= \frac{3(x+1) + 5x(x-1) - (3x+1) + 2(x^2-1)}{(x-1)(x+1)}$$

$$= \frac{3x+3 + 5x^2 - 5x - 3x - 1 + 2x^2 - 2}{(x-1)(x+1)}$$

$$= \frac{7x^2 - 5x}{(x-1)(x+1)}$$