# CORRECTION FICHE N°2 (MATHS)

Classe : 3e

## CALCUL LITTERAL

### Exercice 1 : Développement

$A = (2x+3)^2$
$= (2x)^2 + 2 \times 2x \times 3 + 3^2$
$\boxed{A = 4x^2 + 12x + 9}$

$B = \left(\frac{2}{3}x + \frac{3}{4}\right)^2$
$= \left(\frac{2}{3}x\right)^2 + 2 \times \frac{2}{3}x \times \frac{3}{4} + \left(\frac{3}{4}\right)^2$
$\boxed{B = \frac{4}{9}x^2 + x + \frac{9}{16}}$

$C = \left(x - \frac{1}{3}\right)^2$
$= x^2 - 2 \times x \times \frac{1}{3} + \left(\frac{1}{3}\right)^2$
$\boxed{C = x^2 - \frac{2}{3}x + \frac{1}{9}}$

$D = (7x - \frac{1}{2})^2$
$= (7x)^2 - 2 \times 7x \times \frac{1}{2} + \left(\frac{1}{2}\right)^2$
$\boxed{D = 49x^2 - 7x + \frac{1}{4}}$

$E = (3x-4)(3x+4)$
$= (3x)^2 - 4^2$
$\boxed{E = 9x^2 - 16}$

$F = \left(\frac{2}{3}x + 1\right)\left(\frac{2}{3}x - 1\right)$
$= \left(\frac{2}{3}x\right)^2 - 1^2$
$\boxed{F = \frac{4}{9}x^2 - 1}$

### Exercice 2 : Factorisation

$A = 9x^2 + 6x + 1$
$= (3x)^2 + 6x + 1^2$
$\boxed{A = (3x+1)^2}$

$B = 16x^2 + 9 + 24x$
$= 16x^2 + 24x + 9$
$= (4x)^2 + 24 + 3^2$
$\boxed{B = (4x+3)^2}$

$C = \frac{4}{9}x^2 - 1$
$= \left(\frac{2}{3}x\right)^2 - 1^2$
$\boxed{C = \left(\frac{2}{3}x - 1\right)\left(\frac{2}{3}x + 1\right)}$

$D = 25x^2 - 10x + 1$
$= (5x)^2 - 10x + 1^2$
$\boxed{D = (5x-1)^2}$

$E = 36 - 12x + x^2$
$= 6^2 - 12x + x^2$
$\boxed{E = (6-x)^2}$

$F = 4x^2 - 9$
$= (2x)^2 - 3^2$
$\boxed{F = (2x-3)(2x+3)}$

### Exercice 3 : Développement

$A(x) = (3x+1)^2 - (x-5)^2$
$= 9x^2 + 6x + 1 - [x^2 - 10x + 25]$
$= 9x^2 + 6x + 1 - x^2 + 10x - 25$
$\boxed{A(x) = 8x^2 + 16x - 24}$

$B(x) = (4x-3)(4x-3) + (6x-5)^2$

$= 16x^2 - 24x + 9 + (6x)^2 - 60x + 25$

$= 16x^2 + 36x^2 - 24x - 60x + 25 + 9$

$\boxed{B(x) = 52x^2 - 84x + 34}$

$C(x) = (x-9)(3x+5)^2$

$= (x-9)(9x^2 + 30x + 25)$

$= 9x^3 + 30x^2 + 25x - 81x^2 - 270x - 225$

$\boxed{C(x) = 9x^3 - 51x^2 - 245x - 225}$

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

$= (2x)^2 - 7^2 - [3x^2 + 6x + 5x + 10]$

$= 4x^2 - 49 - 3x^2 - 6x - 5x - 10$

$\boxed{D(x) = x^2 - 11x - 59}$

$E(x) = 7x(2x-3)^2 + 8x^3 - 7x^2$

$= 7x(4x^2 - 12x + 9) + 8x^3 - 7x^2$

$= 28x^3 - 84x^2 + 63x + 8x^3 - 7x^2$

$\boxed{E(x) = 36x^3 - 91x^2 + 63x}$

## Exercice 4 : Factorisation

$f(x) = (3x+1)^2 - 15(3x+1)$

$= (3x+1)[3x+1-15]$

$\boxed{f(x) = (3x+1)(3x-14)}$

$g(x) = 2x(4-2x) - (2-x)(x-1)$

$= 4x(2-x) - (2-x)(x-1)$

$= (2-x)[4x - x + 1]$

$\boxed{g(x) = (2-x)(3x+1)}$

$h(x) = x^3 - x - (x+1)(2x+10)$

$= x(x^2-1) - (x+1)(2x+10)$

$= x(x-1)(x+1) - (x+1)(2x+10)$

$h(x) = (x+1)\left[x(x-1) - (2x+10)\right]$

$h(x) = (x+1)(x^2 - x - 2x - 10)$

$h(x) = (x+1)(x^2 - 3x - 10)$

$\boxed{h(x) = (x+1)(x+2)(x-5)}$

$j(x) = x^2 + 6x + 8$

$= x^2 + 2 \times x$

$\boxed{j(x) = (x+4)(x+2)}$

$K(x) = (2x+1)^2 - 4 + 8x + 12$

$= (2x+1)^2 + 8x + 8$

$= 4x^2 + 4x + 1 + 8x + 8$

$= 4x^2 + 12x + 9$

$\boxed{K(x) = 4\left(x + \frac{3}{2}\right)^2}$

$\ell(x) = 3x^2 + 18x + 27$

$= (\sqrt{3}x)^2 + 2 \times \sqrt{3}x \times 3\sqrt{3} + (3\sqrt{3})^2$

$\boxed{\ell(x) = (\sqrt{3}x + 3\sqrt{3})^2}$

$m(x) = 16(x-3)^2 - 49(2x+1)^2$

$= 4^2(x-3)^2 - 7^2(2x+1)^2$

$= (4x-12)^2 - (14x+7)^2$

$= (4x - 12 - (14x+7))(4x - 12 + (14x+7))$

$= (4x - 12 - 14x - 7)(4x - 12 + 14x + 7)$

$\boxed{m(x) = (-10x - 19)(18x - 5)}$

$A(x) = (7x-1)(4x-2) - (1-7x)(3x-1)$

$= (7x-1)(4x-2) + (7x-1)(3x-1)$

$= (7x-1)[4x - 2 + 3x - 1]$

$\boxed{A(x) = (7x-1)(7x-3)}$

$$C(x) = 4(4x+1)^2 - 9(3x+2)^2$$
$$= 2^2(4x+1)^2 - 3^2(3x+2)^2$$
$$= (8x+2)^2 - (9x+6)^2$$
$$= (8x+2-(9x+6))(8x+2+(9x+6))$$
$$= (8x+2-9x-6)(8x+2+9x+6)$$
$$= (-x-4)(17x+8)$$

$$\boxed{C(x) = -(x+4)(17x+8)}$$

$$D(x) = (9x^2-24x+16) + (-4x^2-4x-1) + (x+3)(10x-6) + (3-5x$$
$$= (3x-4)^2 - (2x+1)^2 + 2(x+3)(5x-3) + (3-5x)$$
$$= (3x-4)^2 - (2x+1)^2 + 2(x+3)(5x-3) - (5x-3)$$
$$= (3x-4)^2 - (2x+1)^2 + (5x-3)[2x+6-1]$$
$$= (3x-4)^2 - (2x+1)^2 + (5x-3)(2x+5)$$
$$= (3x-4-2x-1)(3x-4+2x+1) + (5x-3)(2x+5)$$
$$= (x-5)(5x-3) + (5x-3)(2x+5)$$
$$= (5x-3)[x-5+2x+5]$$
$$D(x) = (5x-3)(3x)$$

$$\boxed{D(x) = 3x(5x-3)}$$