Fiche de cours	Mathématiques	Quatrième
Chapitre : Développement	Développement	

1. Réduction.

Réduire une expression, c'est assembler les éléments de même nature.

$A(x) = 3 - 2x + y - 5 + 6x - 2y$

On assemble les éléments de même nature en entourant l'élément et son signe.

$A(x) = \boxed{3}\ \boxed{-2x}\ \boxed{+y}\ \boxed{-5}\ \boxed{+6x}\ \boxed{-2y}$

$A(x) = \underbrace{y - 2y}_{-1y}\ \underbrace{-2x + 6x}_{+4x}\ \underbrace{+3 - 5}_{-2}$

$\boxed{A(x) = -y + 4x - 2}$

$B(x) = 5 - 7x + 3x^2 - 8 + 6x - 2x^2$

On assemble les éléments de même nature en entourant l'élément et son signe.

$B(x) = \boxed{5}\ \boxed{-7x}\ \boxed{+3x^2}\ \boxed{-8}\ \boxed{+6x}\ \boxed{-2x^2}$

$B(x) = \underbrace{3x^2 - 2x^2}_{x^2}\ \underbrace{-7x + 6x}_{-1x}\ \underbrace{+5 - 8}_{-3}$

$\boxed{B(x) = x^2 - x - 3}$

2. Multiplication de "monômes".

$$\boxed{(ax^n) \times (bx^p) = (a \times b)\ \underbrace{x^n \times x^p}_{x^{n+p}} = (a \times b)\ x^{n+p}}$$

Rappels

$1x = x$	$x^0 = 1$
$-1x = -x$	$x^1 = x$
$0x = 0$	$x \times x = x^2$
$-(-3x) = 3x$	$x \times x^2 = x^3$
$2x = 2 \times x$	$x^n \times x^p = x^{n+p}$

$\boxed{a \times (bx) = (a \times b)\ x}$ $(n = 0\ et\ p = 1)$

$C(x) = -5 \times (3x) = \underbrace{(-5 \times 3)}_{-15}\ x$

$\boxed{C(x) = -15x}$

$\boxed{(ax) \times (bx) = (a \times b)\ \underbrace{x \times x}_{x^2} = (a \times b)\ x^2}$

$D(x) = (4x) \times (-2x) = \underbrace{(4 \times (-2))}_{-8}\ \underbrace{x \times x}_{x^2}$

$\boxed{D(x) = -8x^2}$

$\boxed{a \times (bx^2) = (a \times b)\ x^2}$ $(n = 0\ et\ p = 2)$

$E(x) = -2 \times (-3x^2) = \underbrace{(-2 \times (-3))}_{+6}\ x^2$

$\boxed{E(x) = 6x^2}$

$\boxed{(ax) \times (bx^2) = (a \times b)\ \underbrace{x \times x^2}_{x^3} = (a \times b)\ x^3}$

$F(x) = (4x) \times (-x^2) = \underbrace{(4 \times (-1))}_{-4}\ \underbrace{x \times x^2}_{x^3}$

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

3. Distributivité simple.

$$\boxed{k \times (a+b) = k \times a + k \times b}$$

$$G(x) = -2 \times (3 - 5x)$$
$$G(x) = \underbrace{(-2) \times 3}_{-6} + \underbrace{(-2) \times (-5x)}_{+10x}$$
$$\boxed{G(x) = 10x - 6}$$

$$H(x) = -2x \times (-3 + 4x)$$
$$H(x) = \underbrace{(-2x) \times (-3)}_{+6x} + \underbrace{(-2x) \times 4x}_{-8x^2}$$
$$\boxed{H(x) = -8x^2 + 6x}$$

Remarque : On rangera toujours les monômes dans l'ordre des puissance décroissantes, c'est à dire par exemple les x^2 en 1er, puis les x et les nombres en dernier.

$$I(x) = -3 \times (2 - x) - (x - 5)$$
$$I(x) = \underbrace{-6}_{(-3)\times 2} \quad \underbrace{+3x}_{(-3)\times(-x)} - x + 5$$

Puis on réduit

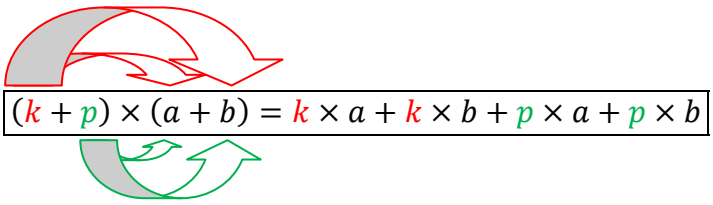
$$I(x) = \boxed{-6} \ \boxed{+3x} \ \boxed{-x} \ \boxed{+5}$$
$$I(x) = \underbrace{+3x - x}_{+2x} \underbrace{-6 + 5}_{-1}$$
$$\boxed{I(x) = 2x - 1}$$

$$J(x) = -3x \times (2 - x) - 5(x - 4)$$
$$J(x) = \underbrace{-6x}_{(-3x)\times 2} \quad \underbrace{+3x^2}_{(-3x)\times(-x)} \quad \underbrace{-5x}_{(-5)\times x} \quad \underbrace{+20}_{(-5)\times(-4)}$$

Puis on réduit

$$J(x) = \boxed{-6x} \ \boxed{+3x^2} \ \boxed{-5x} \ \boxed{+20}$$
$$J(x) = 3x^2 \underbrace{-6x - 5x}_{-11x} + 20$$
$$\boxed{J(x) = 3x^2 - 11x + 20}$$

4. Distributivité double.



$$\boxed{(k+p) \times (a+b) = k \times a + k \times b + p \times a + p \times b}$$

$$K(x) = (4x + 2)(5 - 3x)$$
$$K(x) = \underbrace{20x}_{4x\times 5} \ \underbrace{-12x^2}_{4x\times(-3x)} \ \underbrace{+10}_{2\times 5} \ \underbrace{-6x}_{2\times(-3x)}$$
$$K(x) = -12x^2 \underbrace{+14x}_{20x-6x} + 10$$
$$\boxed{K(x) = -12x^2 + 14x + 10}$$

$$L(x) = (-5x + 1)(1 + 5x)$$
$$L(x) = \underbrace{-5x}_{-5x\times 1} \ \underbrace{-25x^2}_{-5x\times 5x} \ \underbrace{+1}_{1\times 1} \ \underbrace{+5x}_{1\times 5x}$$
$$L(x) = -25x^2 \underbrace{+0x}_{-5x+5x} + 1$$
$$\boxed{L(x) = -25x^2 + 1}$$

$$M(x) = (4x + 2)(5 - 3x) - 2(-5x + 1)(1 + 5x)$$
$$M(x) = \underbrace{20x}_{4x\times 5} \ \underbrace{-12x^2}_{4x\times(-3x)} \ \underbrace{+10}_{2\times 5} \ \underbrace{-6x}_{2\times(-3x)}$$
$$M(x) = -12x^2 + 14x + 10$$

$$\boxed{-2} \times \left(\underbrace{-5x}_{-5x\times 1} \ \underbrace{-25x^2}_{-5x\times 5x} \ \underbrace{+1}_{1\times 1} \ \underbrace{+5x}_{1\times 5x} \right)$$
$$+ \underbrace{10x}_{\boxed{-2}\times(-5x)} \ \underbrace{+50x^2}_{\boxed{-2}\times(-25x^2)} \ \underbrace{-2}_{\boxed{-2}\times 1} \ \underbrace{-10x}_{\boxed{-2}\times 5x}$$

$$M(x) = \underbrace{38x^2}_{-12x^2+50x^2} \ \underbrace{+14x}_{14x+10x-10x} \ \underbrace{+8}_{10-2}$$
$$\boxed{M(x) = 38x^2 + 18x + 8}$$