

## Calculs littéraux : fiche d'entraînement n°1

Supprimer les parenthèses et simplifier les expressions suivantes

$$A = 5 + (3x + 2)$$

$$B = 13x - 4 - (5x - 7)$$

$$C = 24x - 7 + (-2x + 3)$$

$$D = 12 - (-2x + 7 - 3y) + 4y$$

$$E = (-7x + 4) - (-4 - 5x)$$

$$F = (-3 - 7x) + (-5x + 1) - (5 + 13x)$$

Développer et simplifier les expressions suivantes

$$G = 3(4x + 4)$$

$$H = (7x - 5)8x$$

$$I = 11x - 3(2 - 7x)$$

$$J = (11x + 3)(2 + 7x)$$

$$K = (11x - 3)(2 - 7x)$$

$$L = (-4 + 3y)(-2x + 7)$$

$$M = (5x + 4)^2$$

$$N = (7 - 3x)^2$$

$$O = (8x - 7)(8x + 7)$$

$$P = (13x - 1)^2$$

$$Q = (3 + 8y)^2$$

$$R = (12x - 4)(12x + 4)$$

Mix : simplifier les expressions suivantes au maximum

$$S = (6x - 4) + 7(3x + 4)$$

$$T = (7 - 4x)4 - (3 - 7x)$$

$$U = 5x - 3 - (4x - 4)(9x + 1)$$

$$V = (2x + 3)^3$$

$$W = 5x(2x - 3)(4x + 2)$$

Factoriser les expressions suivantes à l'aide des formules de 5<sup>ème</sup> ( $k(a + b)$  et  $k(a - b)$ )

$$A = 3x + 3y$$

$$B = 8 - 4x$$

$$C = 12 + 6x + 10y$$

$$D = 15y - 15$$

$$E = 66 - 22y + 55x$$

$$F = 7 + 7x + 21y$$

Factoriser les expressions suivantes en utilisant les identités remarquables

$$G = x^2 + 2x + 1$$

$$H = 4 - 12y + 9y^2$$

$$I = 16 - 25x^2$$

$$J = 1 - y^4 = 1 - (y^2)^2 =$$

$$K = 100x^2 + 140xy + 49y^2$$

$$L = 144x^2 + 264x + 121$$

$$M = 81y^2 - 108y + 36$$

Factoriser au maximum mes expressions suivantes

$$N = 16 - 8z^2 + z^4$$

$$O = (2x - 5)^2 - (4 + 7x)^2$$

$$P = 3x^2 + 6x + 3 = 3(x^2 + 2x + 1) =$$

$$Q = 50 - 8x^2$$

$$R = 490x^2 - 420x + 90$$

$$S = (2x - 5)7x - 8(2x - 5)$$

$$T = (8x - 11) - 7x(8x - 11)$$

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

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

$$W = (5 - 7x)7x - (5 - 7x)y - (7x - 5)8$$

**Astuce pour les V et W :**  $(5x - 4)$  et  $(-5x + 4)$  sont des expressions opposées, on a donc  $(-5x + 4) = -(5x - 4) = (-1)(5x - 4)$   
De plus  $(-5x + 4) = (4 - 5x)$

## Calculs littéraux : fiche d'entraînement n°1 (correction)

Supprimer les parenthèses et simplifier les expressions suivantes

$$A = 5 + (3x + 2) = 5 + 3x + 2 = 3x + 7$$

$$B = 13x - 4 - (5x - 7) = 13x - 4 - 5x + 7 = 8x + 3$$

$$C = 24x - 7 + (-2x + 3) = 24x - 7 - 2x + 3 = 22x - 4$$

$$D = 12 - (-2x + 7 - 3y) + 4y = 12 + 2x - 7 + 3y + 4y = 2x + 7y + 5$$

$$E = (-7x + 4) - (-4 - 5x) = -7x + 4 + 4 + 5x = -2x + 8$$

$$F = (-3 - 7x) + (-5x + 1) - (5 + 13x) = -3 - 7x - 5x + 1 - 5 - 13x = -25x - 7$$

Développer et simplifier les expressions suivantes

$$G = 3(4x + 4) = 12x + 12$$

$$H = (7x - 5)8x = 56x^2 - 40x$$

$$I = 11x - 3(2 - 7x) = 11x - (6 - 21x) = 11x - 6 + 21x = 32x - 6$$

$$J = (11x + 3)(2 + 7x) = 22x + 77x^2 + 6 + 21x = 77x^2 + 43x + 6$$

$$K = (11x - 3)(2 - 7x) = 22x - 77x^2 - 6 + 21x = -77x^2 + 43x - 6$$

$$L = (-4 + 3y)(-2x + 7) = 8x - 28 - 6xy + 21y$$

$$M = (5x + 4)^2 = (5x)^2 + 2(5x)(4) + (4)^2 = 25x^2 + 40x + 16$$

$$N = (7 - 3x)^2 = (7)^2 - 2(7)(3x) + (3x)^2 = 49 - 42x + 9x^2$$

$$O = (8x - 7)(8x + 7) = (8x)^2 - (7)^2 = 64x^2 - 49$$

$$P = (13x - 1)^2 = (13x)^2 - 2(13x)(1) + (1)^2 = 169x^2 - 26x + 1$$

$$Q = (3 + 8y)^2 = (3)^2 + 2(3)(8y) + (8y)^2 = 9 + 48y + 64y^2$$

$$R = (12x - 4)(12x + 4) = (12x)^2 - (4)^2 = 144x^2 - 16$$

Mix : simplifier les expressions suivantes au maximum

$$S = (6x - 4) + 7(3x + 4) = 6x - 4 + (21x + 28) = 27x + 24$$

$$T = (7 - 4x)4 - (3 - 7x) = 28 - 16x - 3 + 7x = -9x + 25$$

$$U = 5x - 3 - (4x - 4)(9x + 1) = 5x - 3 - (36x^2 + 4x - 36x - 4)$$

$$= 5x - 3 - 36x^2 - 4x + 36x + 4 = -36x^2 + 37x + 1$$

$$V = (2x + 3)^3 = (2x + 3)^2(2x + 3) = (4x^2 + 12x + 9)(2x + 3)$$

$$= 8x^3 + 12x^2 + 24x^2 + 36x + 18x + 27 = 8x^3 + 36x^2 + 54x + 27$$

$$W = 5x(2x - 3)(4x + 2) = (10x^2 - 15x)(4x + 2)$$

$$= 40x^3 + 20x^2 - 60x^2 - 30x = 40x^3 - 40x^2 - 30x$$

Factoriser les expressions suivantes à l'aide des formules de 5<sup>ème</sup> ( $k(a + b)$  et  $k(a - b)$ )

$$A = 3x + 3y = 3(x + y)$$

$$B = 8 - 4x = 4 \times 2 - 4x = 4(2 - x)$$

$$C = 12 + 6x + 10y = 2 \times 6 + 2 \times 3x + 2 \times 5y = 2(6 + 3x + 5y)$$

$$D = 15y - 15 = 15y - 15 \times 1 = 15(y - 1)$$

$$E = 66 - 22y + 55x = 11 \times 6 - 11 \times 2y + 11 \times 5x = 11(6 - 2y + 5x)$$

$$F = 7 + 7x + 21y = 7 \times 1 + 7x + 7 \times 3y = 7(1 + x + 3y)$$

Factoriser les expressions suivantes en utilisant les identités remarquables

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

$$H = 4 - 12y + 9y^2 = 2^2 - 2(2)(3y) + (3y)^2 = (2 - 3y)^2$$

$$I = 16 - 25x^2 = 4^2 - (5x)^2 = (4 - 5x)(4 + 5x)$$

$$J = 1 - y^4 = 1 - (y^2)^2 = (1 - y^2)(1 + y^2) = (1 - y)(1 + y)(1 + y^2)$$

$$K = 100x^2 + 140xy + 49y^2 = (10x)^2 + 2(10x)(7y) + (7y)^2 = (10x + 7y)^2$$

$$L = 144x^2 + 264x + 121 = (12x)^2 + 2(12x)11 + 11^2 = (12x + 11)^2$$

$$M = 81y^2 - 108y + 36 = (9y)^2 - 2(9y)6 + 6^2 = (9y - 6)^2$$

Factoriser au maximum mes expressions suivantes

$$N = 16 - 8z^2 + z^4 = 4^2 - 2(4)z^2 + (z^2)^2 = (4 - z^2)^2 = ((2 - z)(2 + z))^2 = (2 - z)^2(2 + z)^2$$

$$O = (2x - 5)^2 - (4 + 7x)^2 = [(2x - 5) + (4 + 7x)][(2x - 5) - (4 + 7x)] = [2x - 5 + 4 + 7x][2x - 5 - 4 - 7x] = [9x - 1][-5x - 9]$$

$$P = 3x^2 + 6x + 3 = 3(x^2 + 2x + 1) = 3(x + 1)^2$$

$$Q = 50 - 8x^2 = 2(25 - 4x^2) = 2(5^2 - (2x)^2) = 2(5 - 2x)(5 + 2x)$$

$$R = 490x^2 - 420x + 90 = 10(49x^2 - 42x + 9) = 10(7x - 3)^2$$

$$S = (2x - 5)7x - 8(2x - 5) = (2x - 5)(7x - 8)$$

$$T = (8x - 11)1 - 7x(8x - 11) = (8x - 11)(1 - 7x)$$

$$U = (1 - 3x)^2 - 2(1 - 3x)(5 + x) + (5 + x)^2 = [(1 - 3x) - (5 + x)]^2 = [1 - 3x - 5 - x]^2 = [-4x - 4]^2$$

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

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

$$W = (5 - 7x)7x - (5 - 7x)y - (7x - 5)8$$

$$= (5 - 7x)7x - (5 - 7x)y - (5 - 7x)(-8)$$

$$= (5 - 7x)(7x - y - (-8)) = (5 - 7x)(7x - y + 8)$$

## Calculs littéraux : fiche d'entraînement n°2

**Supprimer les parenthèses et simplifier les expressions suivantes :**

$$A = 4 + (3x - 2) = \dots\dots\dots$$

$$B = -3x - (13x - 2) + 2 = \dots\dots\dots$$

$$C = -4x + 2 + (-x + 8) = \dots\dots\dots$$

$$D = 5x - (-6 + 7y - 3x) + 4y = \dots\dots\dots$$

$$E = (9x - 7) - (-3x - 5) = \dots\dots\dots$$

$$F = (-3x + 7) + (-5 + x) - (5x + 7) = \dots\dots\dots$$

$$\dots\dots\dots$$

**Développer et simplifier les expressions suivantes :**

$$G = 2(7x + 5) = \dots\dots\dots$$

$$H = (7 - 5x)3x = \dots\dots\dots$$

$$I = 11 - 5(-6x + 11) = \dots\dots\dots$$

$$J = (11 + 3x)(2x + 8) = \dots\dots\dots$$

$$K = (11 - 3x)(-2x - 8) = \dots\dots\dots$$

$$L = (-4x + 3)(-2y + 2) = \dots\dots\dots$$

$$M = (5 + 6x)^2 = \dots\dots\dots$$

$$N = (7x - 8)^2 = \dots\dots\dots$$

$$O = (4x - 14)(4x + 14) = \dots\dots\dots$$

$$P = (12x - 3)^2 = \dots\dots\dots$$

$$Q = (10y + 5)^2 = \dots\dots\dots$$

$$R = (2x - 15)(2x + 15) = \dots\dots\dots$$

**Mix : simplifier les expressions suivantes au maximum :**

$$S = (9 + 2x) + 5(3x - 4) = \dots\dots\dots$$

$$T = (1 - 6x)7 - (9 - 8x) = \dots\dots\dots$$

$$U = 5 - 3x - (2x + 4)(2x + 7) = \dots\dots\dots$$

$$\dots\dots\dots$$

$$V = (2x - 5)^3 = \dots\dots\dots$$

$$\dots\dots\dots$$

$$W = 3x(7x - 1)(-x + 2) = \dots\dots\dots$$

$$\dots\dots\dots$$

**Factoriser les expressions suivantes à l'aide des formules de 5<sup>ème</sup> (  $k(a + b)$  et  $k(a - b)$  )**

$$A = 5x - 5z = \dots\dots\dots$$

$$B = 8 + 2x = \dots\dots\dots$$

$$C = 14 + 21x + 28y = \dots\dots\dots$$

$$D = 9 - 9y = \dots\dots\dots$$

$$E = 15 - 30y + 150x = \dots\dots\dots$$

$$F = 26x + 13 + 39y = \dots\dots\dots$$

**Factoriser les expressions suivantes en utilisant les identités remarquables.**

$$G = x^2 - 14x + 49 = \dots\dots\dots$$

$$H = 36 + 24y + 4y^2 = \dots\dots\dots$$

$$I = 64 - 121x^2 = \dots\dots\dots$$

$$J = z^2 - y^4 = z^2 - (y^2)^2 = \dots\dots\dots$$

$$K = 196x^2 + 28xy + y^2 = \dots\dots\dots$$

$$L = 25x^2 + 110x + 121 = \dots\dots\dots$$

$$M = 100y^2 - 160y + 64 = \dots\dots\dots$$

**Factoriser au maximum mes expressions suivantes :**

$$N = 81z^4 - 18z^2 + 1 = \dots\dots\dots$$

$$\dots\dots\dots$$

$$O = (3x - 15)^2 - (4x - 7)^2 = \dots\dots\dots$$

$$\dots\dots\dots$$

$$P = 3x^2 + 42x + 147 = 3(\dots\dots\dots) = \dots\dots\dots$$

$$Q = 28 - 63x^2 = \dots\dots\dots$$

$$R = 245x^2 - 210x + 45 = \dots\dots\dots$$

$$S = (2x + 3)7x + (2x + 3)11 = \dots\dots\dots$$

$$T = 8x(18x - 1) - (18x - 1) = \dots\dots\dots$$

$$U = (5 + 3x)^2 - 2(5 + 3x)(7 - 2x) + (7 - 2x)^2 = \dots\dots\dots$$

$$\dots\dots\dots$$

$$V = (5 - 4x)11 + x(-5 + 4x) = \dots\dots\dots$$

$$\dots\dots\dots$$

$$W = (9x - 7)7x - 6(-9x + 7) - (7 - 9x)3 = \dots\dots\dots$$

## Calculs littéraux : fiche d'entraînement n°2 (correction)

Supprimer les parenthèses et simplifier les expressions suivantes

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

$$B = -3x - (13x - 2) + 2 = -3x - 13x + 2 + 2 = -16x + 4$$

$$C = -4x + 2 + (-x + 8) = -4x + 2 - x + 8 = -5x + 10$$

$$D = 5x - (-6 + 7y - 3x) + 4y = 5x + 6 - 7y + 3x + 4y = 8x - 3y + 6$$

$$E = (9x - 7) - (-3x - 5) = 9x - 7 + 3x + 5 = 12x - 2$$

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

Développer et simplifier les expressions suivantes

$$G = 2(7x + 5) = 14x + 10$$

$$H = (7 - 5x)3x = 21x - 15x^2$$

$$I = 11 - 5(-6x + 11) = 11 - (-30x + 55) = 11 + 30x - 55 = 30x - 44$$

$$J = (11 + 3x)(2x + 8) = 22x + 88 + 6x^2 + 24x = 6x^2 + 46x + 88$$

$$K = (11 - 3x)(-2x - 8) = -22x - 88 + 6x^2 + 24x = 6x^2 + 2x - 88$$

$$L = (-4x + 3)(-2y + 2) = 8xy - 8x - 6y + 6$$

$$M = (5 + 6x)^2 = 25 + 60x + 36x^2$$

$$N = (7x - 8)^2 = 49x^2 - 112x + 64$$

$$O = (4x - 14)(4x + 14) = 16x^2 - 196$$

$$P = (12x - 3)^2 = 144x^2 - 72x + 9$$

$$Q = (10y + 5)^2 = 100y^2 + 100y + 25$$

$$R = (2x - 15)(2x + 15) = 4x^2 - 225$$

Mix : simplifier les expressions suivantes au maximum

$$S = (9 + 2x) + 5(3x - 4) = 9 + 2x + (15x - 20) = 17x - 11$$

$$T = (1 - 6x)7 - (9 - 8x) = (7 - 42x) - 9 + 8x = -34x - 2$$

$$U = 5 - 3x - (2x + 4)(2x + 7) = 5 - 3x - (4x^2 + 14x + 8x + 28)$$

$$= 5 - 3x - 4x^2 - 14x - 8x - 28 = -4x^2 - 25x - 23$$

$$V = (2x - 5)^3 = (2x - 5)^2(2x - 5) = (4x^2 - 20x + 25)(2x - 5)$$

$$= 8x^3 - 20x^2 - 40x^2 + 100x + 50x - 125 = 8x^3 - 60x^2 + 150x - 125$$

$$W = 3x(7x - 1)(-x + 2) = (21x^2 - 3x)(-x + 2)$$

$$= -21x^3 + 42x^2 + 3x^2 - 6x = -21x^3 + 45x^2 - 6x$$

Factoriser les expressions suivantes à l'aide des formules de 5<sup>ème</sup> ( $k(a + b)$  et  $k(a - b)$ )

$$A = 5x - 5z = 5(x - z)$$

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

$$C = 14 + 21x + 28y = 7(2 + 3x + 4y)$$

$$D = 9 - 9y = 9(1 - y)$$

$$E = 15 - 30y + 150x = 15(1 - 2y + 10x)$$

$$F = 26x + 13 + 39y = 13(2x + 1 + 3y)$$

Factoriser les expressions suivantes en utilisant les identités remarquables

$$G = x^2 - 14x + 49 = (x - 7)^2$$

$$H = 36 + 24y + 4y^2 = (6 + 2y)^2$$

$$I = 64 - 121x^2 = 8^2 - (11x)^2 = (8 - 11x)(8 + 11x)$$

$$J = z^2 - y^4 = z^2 - (y^2)^2 = (z - y^2)(z + y^2)$$

$$K = 196x^2 + 28xy + y^2 = (14x)^2 + 2(14x)y + y^2 = (14x + y)^2$$

$$L = 25x^2 + 110x + 121 = (5x)^2 + 2(5x)11 + 11^2 = (5x + 11)^2$$

$$M = 100y^2 - 160y + 64 = (10y)^2 - 2(10y)8 + 8^2 = (10y - 8)^2$$

Factoriser au maximum mes expressions suivantes

$$N = 81z^4 - 18z^2 + 1 = (9z^2)^2 - 2(9z^2)1 + 1^2 = (9z^2 - 1)^2$$

$$= ((3z)^2 - 1^2)^2 = [(3z - 1)(3z + 1)]^2 = (3z - 1)^2(3z + 1)^2$$

$$O = (3x - 15)^2 - (4x - 7)^2 = [(3x - 15) - (4x - 7)][(3x - 15) + (4x - 7)]$$

$$= [3x - 15 - 4x + 7][3x - 15 + 4x - 7] = [-x - 8][7x - 22]$$

$$P = 3x^2 + 42x + 147 = 3(x^2 + 14x + 49) = 3(x + 7)^2$$

$$Q = 28 - 63x^2 = 7(4 - 9x^2) = 7(2 - 3x)(2 + 3x)$$

$$R = 245x^2 - 210x + 45 = 5((7x)^2 - 2(7x)3 + 3^2) = 5(7x - 3)^2$$

$$S = (2x + 3)7x + (2x + 3)11 = (2x + 3)(7x + 11)$$

$$T = 8x(18x - 1) - (18x - 1) = (8x - 1)(18x - 1)$$

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

$$= [5 + 3x - 7 + 2x]^2 = [5x - 2]^2$$

$$V = (5 - 4x)11 + x(-5 + 4x) = (5 - 4x)11 + x(-1)(5 - 4x)$$

$$= (5 - 4x)(11 + x(-1)) = (5 - 4x)(11 - x)$$

$$W = (9x - 7)7x - 6(-9x + 7) - (7 - 9x)3$$

$$= (9x - 7)7x + 6(9x - 7) + (9x - 7)3 = (9x - 7)(7x + 6 + 3)$$

$$= (9x - 7)(7x + 9)$$