

EXERCICE 1

Factoriser :

$$A = 3x + 6$$

$$B = 3x^2 + x$$

$$C = x^5 + x^4$$

$$D = 3xy - x^2$$

$$E = 3a + 3b$$

$$F = 2a - 4b$$

$$G = a(a+b) - a$$

$$H = 5a^2 - 5b^2$$

$$I = ab^3 - a^5b^4$$

$$J = ab^7 - a^3b^2$$

$$K = a^3b - ab^3$$

$$L = 4a^2 - 9b^2$$

EXERCICE 2

Factoriser :

$$A = 15x^2 - 25x^4$$

$$B = 42y^5 - 49y^2$$

$$C = 12x^4y^2 - 18x^3y^5$$

$$D = 22x^9y^4 + 18x^4y^6$$

$$E = 24a^5b^2 - 32a^4b^8 + 36a^3b^5$$

$$F = 36x^7y^4 - 45x^{11}y^7 + 63x^9y^3$$

EXERCICE 3

Gestion des parenthèses : calculer :

$$S = (3x - 2) - (6x - 1) + 3(5 - 2x) - 4(1 + 8x)$$

Factoriser :

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

$$B = (2x - 5)(x - 7) - (2 - 5x)(2x - 5)$$

EXERCICE 4Montrer que pour tout a et b on a :

$$1. (b^2 - 8b + 3) - (a^2 - 8a + 3) = (b - a)(a + b - 8)$$

$$2. (b^3 - 3b) - (a^3 - 3a) = (b - a)(a^2 + ab + b^2 - 3)$$

$$3. (-2b^2 + 4b + 1) - (-2a^2 + 4a + 1) = 2(a - b)(a + b - 2)$$

CORRIGE – NOTRE DAME DE LA MERCI – MONTPELLIER**EXERCICE 1** Factoriser :

$$A = 3x + 6 = 3 \times x + 3 \times 2 = 3(x + 2)$$

$$B = 3x^2 + x = x \times 3x + x \times 1 = x(3x + 1)$$

$$C = x^5 + x^4 = x^4 \times x + x^4 \times 1 = x^4(x + 1)$$

$$D = 3xy - x^2 = x \times 3y - x \times x = x(3y - x)$$

$$E = 3a + 3b = 3(a + b)$$

$$F = 2 \times a - 2 \times 2b = 2(a - 2b)$$

$$G = a(a + b) - a = a \times (a + b) - a \times 1 = a[(a + b) - 1] = a(a + b - 1) \quad H = 5a^2 - 5b^2 = 5(a^2 - b^2)$$

$$I = ab^3 - a^5b^4 = ab^3 \times 1 - a \times a^4 \times b^3 \times b = ab^3 \times 1 - ab^3 \times a^4b = ab^3(1 - a^4b)$$

$$J = ab^7 - a^3b^2 = a \times b^2 \times b^5 - a \times a^2 \times b^2 = ab^2 \times b^5 - ab^2 \times a^2 = ab^2(b^5 - a^2)$$

$$K = a^3b - ab^3 = a \times a^2 \times b - a \times b \times b^2 = ab \times a^2 - ab \times b^2 = ab(a^2 - b^2)$$

$$L = 4a^2 - 9b^2 = (2a)^2 - (3b)^2 = (2a + 3b)(2a - 3b) \rightarrow \text{vous aurez reconnu une Identité remarquable}$$

EXERCICE 2 Factoriser

$$A = 15x^2 - 25x^4 = 5 \times 3 \times x^2 - 5 \times 5 \times x^2 \times x^2 = 5x^2 \times 3 - 5x^2 \times 5x^2 = 5x^2(3 - 5x^2)$$

$$B = 42y^5 - 49y^2 = 7 \times 6 \times y^2 \times y^3 - 7 \times 7 \times y^2 = 7y^2 \times 6y^3 - 7y^2 \times 7 = 7y^2(6y^3 - 7)$$

$$C = 12x^4y^2 - 18x^3y^5 = 6 \times 2 \times x^3 \times x \times y^2 - 6 \times 3 \times x^3 \times y^2 \times y^3 = 6x^3y^2 \times 2x - 6x^3y^2 \times 3y^3 = 6x^3y^2(2x - 3y^3)$$

$$D = 22x^9y^4 + 18x^4y^6 = 2 \times 11 \times x^4 \times x^5 \times y^4 + 2 \times 9 \times x^4 \times y^4 \times y^2 = 2x^4y^4 \times 11x^5 + 2x^4y^4 \times 9y^2 = 2x^4y^4(11x^5 + 9y^2)$$

$$E = 24a^5b^2 - 32a^4b^8 + 36a^3b^5 = 4 \times 6 \times a^3 \times a^2 \times b^2 - 4 \times 8 \times a^3 \times a \times b^2 \times b^6 + 4 \times 9 \times a^3 \times b^2 \times b^3 = 4a^3b^2 \times 6a^2 - 4a^3b^2 \times 8ab^6 + 4a^3b^2 \times 9b^3 = 4a^3b^2(6a^2 - 8ab^6 + 9b^3)$$

$$F = 36x^7y^4 - 45x^{11}y^7 + 63x^9y^3 = 9 \times 4 \times x^7 \times y^3 \times y - 9 \times 5 \times x^7 \times x^4 \times y^3 \times y^4 + 9 \times 7 \times x^7 \times x^2 \times y^3 = 9x^7y^3 \times 4y - 9x^7y^3 \times 5x^4y^4 + 9x^7y^3 \times 7x^2 = 9x^7y^3(4y - 5x^4y^4 + 7x^2)$$

EXERCICE 3

Gestion des parenthèses : calculer :

$$S = (3x - 2) - (6x - 1) + 3(5 - 2x) - 4(1 + 8x)$$

$$S = 3x - 2 - 6x + 1 + 15 - 6x - 4 - 32x$$

$$S = -41x + 10$$

Factoriser :

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

$$B = (2x - 5)(x - 7) - (2 - 5x)(2x - 5)$$

$$A = (x + 5)[(x + 2) + (7 + x)]$$

$$B = (2x - 5)[(x - 7) - (2 - 5x)]$$

$$A = (x + 5)[x + 2 + 7 + x]$$

$$B = (2x - 5)[x - 7 - 2 + 5x]$$

$$A = (x + 5)(2x + 9)$$

$$B = (2x - 5)(6x - 9)$$

EXERCICE 4

$$\begin{aligned} (b^2 - 8b + 3) - (a^2 - 8a + 3) &= b^2 - 8b + 3 - a^2 + 8a - 3 = b^2 - a^2 - 8b + 8a = (b + a)(b - a) + 8(a - b) \\ &= (b + a)(b - a) - 8(b - a) = (b - a)[(b + a) - 8] = (b - a)(b + a - 8) \end{aligned}$$

$$(b^3 - 3b) - (a^3 - 3a) = b^3 - 3b - a^3 + 3a$$

$$(b-a)(a^2 + ab + b^2 - 3) = ba^2 + ab^2 + b^3 - 3b - a^3 - a^2b - ab^2 + 3a = b^3 - a^3 - 3b + 3a$$

$$\text{AINSI : } (b^3 - 3b) - (a^3 - 3a) = (b-a)(a^2 + ab + b^2 - 3)$$

$$(-2b^2 + 4b + 1) - (-2a^2 + 4a + 1) = -2b^2 + 4b + 1 + 2a^2 - 4a - 1 = 2a^2 - 2b^2 + 4b - 4a$$

$$2(a-b)(a+b-2) = 2(a^2 + ab - 2a - ab - b^2 + 2b) = 2a^2 - 2b^2 + 4b - 4a$$

$$\text{AINSI : } (-2b^2 + 4b + 1) - (-2a^2 + 4a + 1) = 2(a-b)(a+b-2)$$