

I. DEVELOPPEMENT ET FACTORISATION :

1) Regle1:

a , b etc des nombres réels

$$a \times (b + c) = ab + ac$$

2) Regle2:

a , b , c et d des nombres réels

$$(a + b) \times (c + d) = ac + ad + bc + bd$$

3) Exemples et exercices:

Exercice1 :

Développer et réduire si possible :

$$A = 2(x+3) \quad ; \quad B = 3(x-5) \quad ; \quad C = 2(x-1)+3(x-1) \quad ; \quad D = 2(x-3)+3(x-2)-5(x-2)$$

Réponse :

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

$$B = 3(x-5) = 3 \times x - 3 \times 5 = 3x - 15$$

$$C = 2(x-1)+3(x-1) = 2x - 2 + 3x - 3 = 5x - 5$$

$$D = 2(x-3)+3(x-2)-5(x-2) = 2x - 6 + 3x - 6 - 5x + 10 = -2$$

Exercice2 :

Factoriser

$$E = 4x + 6 \quad ; \quad F = x^2 - 4x \quad ; \quad G = 5(x-3) + 3(x-3) \quad ; \quad H = x(1-4x) - 3(4x-1)$$

Réponse :

On a:

$$E = 4x + 6 = 2 \times 2x + 2 \times 3 = 2(2x + 3) \quad ; \quad F = x^2 - 4x = x \times x - 4 \times x = x(x - 4)$$

$$G = 5(x-3) + 3(x-3) = (5+3)(x-3) = 8(x-3) \quad ; \quad H = x(1-4x) - 3(4x-1) = -x(4x-1) - 3(4x-1) = (4x-1)(-x-3)$$

Exercice3 :

Développer et réduire si possible :

$$A = (x+1)(2x+3) \quad ; \quad B = (x+2)(x-3) \quad ; \quad C = (x-7)(2-x) \quad ; \quad D = (4x-1)(x+1) - 2x(1+2x)$$

Réponse :

On a:

$$A = (x+1)(2x+3) = 2x^2 + 3x + 2x + 3 = 2x^2 + 5x + 3 \quad ; \quad B = (x+2)(x-3) = x^2 - 3x + 2x - 6 = x^2 - x - 6$$

$$C = (x-7)(2-x) = 2x - x^2 - 14 + 7x = -x^2 + 9x - 14$$

$$D = (4x-1)(x+1) - 2x(1+2x) = 4x^2 + 4x - x - 1 - 2x - 4x^2 = x - 1$$

Exercice 4 :

Factoriser

$$A = (x-3)(x-2) + 5(x-3) \quad ; \quad B = 3(5-9x) - (5-9x)(1-3x) \quad ; \quad C = (2x-5)(7x+5) - (2x-5)^2$$

Réponse :

On a:

$$A = (x-3)(x-2) + 5(x-3) = (x-3)[(x-2)+5] = (x-3)(x+3)$$

$$B = 3(5-9x) - (5-9x)(1-3x) = (5-9x)[3 - (1-3x)] = (5-9x)(2+3x)$$

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

II. LES IDENTITES REMARQUABLES

1) Formules

a ; b etc des nombres réels

$$(a+b)^2 = a^2 + 2ab + b^2 \quad ; \quad (a-b)^2 = a^2 - 2ab + b^2 \quad ; \quad a^2 - b^2 = (a-b)(a+b)$$

2) Exercice 1 :

Développer et réduire en utilisant l'identité remarquable :

$$A = (x+5)^2 \quad ; \quad B = (6-x)^2 \quad ; \quad C = (x+5)(x-5)$$

Réponse :

$$A = (x+5)^2 = x^2 + 2 \times x \times 5 + 5^2 = x^2 + 10x + 25$$

$$B = (6-x)^2 = 6^2 - 2 \times 6 \times x + x^2 = 36 - 12x + x^2$$

$$C = (x+5)(x-5) = x^2 - 5^2 = x^2 - 25$$

Exercice 2 :

Factoriser

$A = 25x^2 + 10x + 1$	$B = 16x^2 - 56x + 49$	$C = 49 - 4x^2$	$D = (x-1)^2 - (2+x)^2$
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Réponse :

$$A = 25x^2 + 10x + 1 = (5x)^2 + 2 \times 5x \times 1 + 1^2 = (5x+1)^2$$

$$B = 16x^2 - 56x + 49 = (4x)^2 - 2 \times 4x \times 7 + 7^2 = (4x-7)^2$$

$$C = 49 - 4x^2 = 7^2 - (2x)^2 = (7-2x)(7+2x)$$

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