

Fiche : Factorisation : Niveau A

A1	$64x^2 - 49$
A2	$(2x+1)(3x+5) + (4x+2)(2x+1)$
A3	$16x^2 - 40x + 25$
A4	$(x-2)(x+3) + (x-2)(4x-1)$
A5	$x^2 + 4x + 4$

A6	$(5x-3)(2x-5) - x(5x-3)$
A7	$t^2 + 12t + 36$
A8	$(x+1)(x+3) - 5(x+3)$
A9	$y^2 - 81$
A10	$(x+4)(x-2) + (3x+1)(x+4)$

A11	$9x^2 - 24x + 16$
A12	$(x-3)(2x+1) + (2x+1)(3x-2)$
A13	$x^2 + 14x + 49$
A14	$(3x+2)(7x-1) - 10(7x-1)$
A15	$100t^2 - 121$

A16	$(x+2)(x+1) - 2x(x+1)$
A17	$9x^2 - 6x + 1$
A18	$2(6x-7) + (6x-7)(x+3)$
A19	$49x^2 - 42x + 9$
A20	$64x^2 - 81$

Fiche : Factorisation : Niveau A : réponses

Fiche : Factorisation : Niveau B

B1	$(7x + 3)(3x - 2) + 3x - 2$
B2	$(x + 5)^2 - 25$
B3	$(6x - 1)(7x - 3) - (7x - 3)(x + 9)$
B4	$4(x - 5) - (x - 5)^2$
B5	$(x + 8)(x + 7) - (2x + 5)(x + 8)$

B6	$(2x + 3)^2 - 16$
B7	$(3x + 1)^2 + (2x + 7)(3x + 1)$
B8	$8x - 5 - (8x + 1)(8x - 5)$
B9	$5(3x - 4) - (x - 2)(3x - 4)$
B10	$x^2 + 10x + 25 + (x + 5)(2x + 1)$

B11	$(x + 3)^2 - (x + 3)(2x + 1)$
B12	$100 - (5x - 4)^2$
B13	$(3x - 7)^2 - 3x + 7$
B14	$(8x + 1)(x - 5) - (x - 5)(2x + 5)$
B15	$-3(x + 9) - (x + 9)(2x + 3)$

Fiche : Factorisation : Niveau C

C1	$9x^2 - 16 + (3x + 4)(3x - 2)$
C2	$(4x - 1)^2 - (x - 5)^2$
C3	$(7x - 5)(3x + 2) - 6(3x + 2)(x + 3)$
C4	$(2x + 3)(2x - 1) + 4x^2 + 12x + 9$
C5	$(6x - 1)^2 - (7x + 2)^2$

C6	$4x^2 - 9 + (2x + 3)(x - 5)$
C7	$(x + 4)(-2x + 1) - 3(x + 4)^2$
C8	$(x + 5)^2 - (x + 5)$
C9	$(2x - 3)^2 - 64x^2$
C10	$100x^2 + 100x + 25 - (10x + 5)(x + 7)$

C11	$(-2x + 3)^2 - (x - 9)^2$
C12	$(x + 3)^2 - 25(3x + 4)^2$
C13	$x^2 - 9 - (2x + 5)(x - 3) + 5x - 15$
C14	$x^2 - 16 + (x + 4)^2$
C15	$(2x + 7)^2 + 10x + 35$

Exercices factorisation

1 Avec facteur commun

$A = 2x + 8$	$F = (x + 3)^2 - (2x - 5)(x + 3)$
$B = 3x^2 - 6x$	$G = (5 - x)(2x + 3) - (6 - 5x)(5 - x)$
$C = 13x - 13$	$H = (4x - 1)(2x - 5) + (2x - 5)^2$
$D = x^2 + (2x + 1)x$	$I = (3x + 5)^2 - 7x(3x + 5) + (2 - 5x)(5 + 3x)$
$E = (x + 3)^2 - (x + 3)(4x - 1)$	$J = (4 - x)^2 + (2x + 1)(4 - x) - (4 - x)(-3x + 2)$

2 Avec égalités remarquables

$A = x^2 - 64$	$F = x^2 - (2x + 5)^2$
$B = x^2 - 6x + 9$	$G = (2x - 3)^2 - (5 - 7x)^2$
$C = 4x^2 + 20x + 25$	$H = (2x + 3)^2 - (x + 1)^2$
$D = x^2 + x + \frac{1}{4}$	$I = \frac{1}{4} - (2x - \frac{1}{3})^2$
$E = 49 - 16x^2$	

3 Avec étapes

$A = -2x^2 + 4x - 2$	$E = 64 - x^2 + (5x + 3)(8 + x)$
$B = -25 - 20x - 4x^2$	$F = 4x^2 - 4x + 1 - (3x + 2)(2x - 1)$
$C = 49 - x^2 - (x + 7)(2x - 3)$	$G = 1 - x^2 + (4x + 3)(x - 1) - (5x + 2)(1 - x)$
$D = (x - 3)(2x + 5) - (3 - x)(3x + 1)$	$H = (4x^2 + 20x + 25) - (9x^2 - 6x + 1)$

Solutions :

$A = 2(x + 4)$	$C = 13(x - 1)$	$E = (x + 3)(-3x + 4)$	$G = (5 - x)(7x - 3)$	$I = (3x + 5)(-9x + 7)$
$B = 3x(x - 2)$	$D = x(3x + 1)$	$F = (x + 3)(-x + 8)$	$H = 6(2x - 5)(x - 1)$	$J = (4 - x)(4x + 3)$

$A = (x + 8)(x - 8)$	$B = (x - 3)^2$	$C = (2x + 5)^2$	$E = (7 - 4x)(7 + 4x)$	$F = (-x - 5)(3x + 5)$
$D = (x + \frac{1}{2})^2$	$G = (-9x + 8)(5x - 2)$	$H = (3x + 4)(x + 2)$	$I = (-2x + \frac{5}{6})(2x + \frac{1}{6})$	

$A = -2(x - 1)^2$	$B = -(2x + 5)^2$	$C = (x + 7)(-3x + 10)$	$D = (5x + 6)(x - 3)$
$E = (4x + 11)(x + 8)$	$F = -(x + 3)(2x - 1)$	$G = 4(2x + 1)(x - 1)$	$H = (5x + 4)(-x + 6)$

A1	$64x^2 - 49 = (8x)^2 - 7^2 = (8x - 7)(8x + 7)$
A2	$(2x+1)(3x+5) + (4x+2)(2x+1) = (2x+1)[3x+5+4x+2]$ $= (2x+1)(7x+7)$
A3	$16x^2 - 40x + 25 = (4x)^2 - 2 \times 4x \times 5 + 5^2 = (4x - 5)^2$
A4	$(x-2)(x+3) + (x-2)(4x-1) = (x-2)[x+3+4x-1] = (x-2)(5x+2)$
A5	$x^2 + 4x + 4 = x^2 + 2 \times x \times 2 + 2^2 = (x + 2)^2$

A6	$(5x-3)(2x-5) - x(5x-3) = (5x-3)[2x-5-x]$ $= (5x-3)(x-5)$
A7	$t^2 + 12t + 36 = t^2 + 2 \times t \times 6 + 6^2 = (t + 6)^2$
A8	$(x+1)(x+3) - 5(x+3) = (x+3)[x+1-5] = (x+3)(x-4)$
A9	$y^2 - 81 = y^2 - 9^2 = (y - 9)(y + 9)$
A10	$(x+4)(x-2) + (3x+1)(x+4) = (x+4)[x-2+3x+1] = (x+4)(4x-1)$

A11	$9x^2 - 24x + 16 = (3x)^2 - 2 \times 3x \times 4 + 4^2 = (3x - 4)^2$
A12	$(x-3)(2x+1) + (2x+1)(3x-2) =$ $(2x+1)[x-3+3x-2] = (2x+1)(4x-5)$
A13	$x^2 + 14x + 49 = x^2 + 2 \times x \times 7 + 7^2 = (x + 7)^2$
A14	$(3x+2)(7x-1) - 10(7x-1) = (7x-1)[3x+2-10] = (7x-1)(3x-8)$
A15	$100t^2 - 121 = (10t)^2 - 11^2 = (10t - 11)(10t + 11)$

A16	$(x+2)(x+1) - 2x(x+1) = (x+1)[x+2-2x] = (x+1)(-x+2)$
A17	$9x^2 - 6x + 1 = (3x)^2 - 2 \times 3x \times 1 + 1^2 = (3x - 1)^2$
A18	$2(6x-7) + (6x-7)(x+3) = (6x-7)[2+x+3] = (6x-7)(x+5)$
A19	$49x^2 - 42x + 9 = (7x)^2 - 2 \times 7x \times 3 + 3^2 = (7x - 3)^2$
A20	$64x^2 - 81 = (8x)^2 - 9^2 = (8x - 9)(8x + 9)$

Fiche : Factorisation : Niveau B : Réponses

B1	$(7x + 3)(3x - 2) + 3x - 2 = (7x + 3)(\underline{3x - 2}) + 1 \times (\underline{3x - 2})$ $= (3x - 2)[7x + 3 + 1] = (3x - 2)(7x + 4)$
B2	$(x + 5)^2 - 25 = (x + 5)^2 - 5^2 = [x + 5 - 5][x + 5 + 5] = x(x + 10)$
B3	$(6x - 1)(7x - 3) - (7x - 3)(x + 9) = (6x - 1)(\underline{7x - 3}) - (\underline{7x - 3})(x + 9)$ $= (7x - 3)[6x - 1 - (x + 9)] = (7x - 3)[6x - 1 - x - 9] = (7x - 3)(5x - 10)$
B4	$4(x - 5) - (x - 5)^2 = 4(\underline{x - 5}) - (x - 5)(\underline{x - 5}) = (x - 5)[4 - (x - 5)]$ $= (x - 5)[4 - x + 5] = (x - 5)(-x + 9)$
B5	$(x + 8)(x + 7) - (2x + 5)(x + 8) = (\underline{x + 8})(x + 7) - (2x + 5)(\underline{x + 8})$ $= (x + 8)[x + 7 - (2x + 5)] = (x + 8)[x + 7 - 2x - 5] = (x + 8)(-x + 2)$

B6	$(2x + 3)^2 - 16 = (2x + 3)^2 - 4^2 = [2x + 3 - 4][2x + 3 + 4] = (2x - 1)(2x + 7)$
B7	$(3x + 1)^2 + (2x + 7)(3x + 1) = (3x + 1)(\underline{3x + 1}) + (2x + 7)(\underline{3x + 1}) =$ $(3x + 1)[3x + 1 + 2x + 7] = (3x + 1)(5x + 8)$
B8	$8x - 5 - (8x + 1)(8x - 5) = 1 \times (\underline{8x - 5}) - (8x + 1)(\underline{8x - 5})$ $= (8x - 5)[1 - (8x + 1)] = (8x - 5)[1 - 8x - 1] = (8x - 5)(-8x)$
B9	$5(3x - 4) - (x - 2)(3x - 4) = 5(\underline{3x - 4}) - (x - 2)(\underline{3x - 4})$ $= (3x - 4)[5 - (x - 2)] = (3x - 4)(5 - x + 2) = (3x - 4)(-x + 7)$
B10	$x^2 + 10x + 25 + (x + 5)(2x + 1) = x^2 + 2 \times x \times 5 + 5^2 + (x + 5)(2x + 1)$ $= (x + 5)^2 + (x + 5)(2x + 1) = (x + 5)(\underline{x + 5}) + (\underline{x + 5})(2x + 1)$ $= (x + 5)[x + 5 + 2x + 1] = (x + 5)(3x + 6)$

B11	$(x + 3)^2 - (x + 3)(2x + 1) = (\underline{x + 3})(x + 3) - (\underline{x + 3})(2x + 1)$ $= (x + 3)[x + 3 - (2x + 1)] = (x + 3)[x + 3 - 2x - 1] = (x + 3)(-x + 2)$
B12	$100 - (5x - 4)^2 = 10^2 - (5x - 4)(5x - 4) = [10 - (5x - 4)][10 + (5x - 4)]$ $= (10 - 5x + 4)(10 + 5x - 4) = (-5x + 14)(5x + 6)$
B13	$(3x - 7)^2 - 3x + 7 = (3x - 7)(\underline{3x - 7}) - 1 \times (\underline{3x - 7}) =$ $(3x - 7)[3x - 7 - 1] = (3x - 7)(3x - 8)$
B14	$(8x + 1)(x - 5) - (x - 5)(2x + 5) = (x - 5)[\underline{8x + 1} - (2x + 5)]$ $= (x - 5)[8x + 1 - 2x - 5] = (x - 5)(6x - 4)$
B15	$-3(x + 9) - (x + 9)(2x + 3) = -3(\underline{x + 9}) - (\underline{x + 9})(2x + 3) =$ $= (x + 9)[-3 - (2x + 3)] = (x + 9)(-3 - 2x - 3) = (x + 9)(-2x - 6)$

Fiche : Factorisation : Réponses : Niveau C

C1	$9x^2 - 16 + (3x + 4)(3x - 2) = (3x)^2 - 4^2 + (3x + 4)(3x - 2) = (3x-4)(3x+4) + (3x+4)(3x-2) = (3x + 4)[3x-4 + 3x-2] = (3x+4)(6x-6)$
C2	$(4x - 1)^2 - (x - 5)^2 = [(4x-1) - (x-5)][(4x-1) + (x-5)] = (4x - 1 - x + 5)(4x - 1 + x - 5) = (3x + 4)(5x - 6)$
C3	$(7x - 5)(3x + 2) - 6(3x + 2)(x + 3) = (7x-5)(3x+2) - 6(3x+2)(x+3) = (3x+2)[7x-5 - 6(x+3)] = (3x+2)(7x-5 - 6x-18) = (3x + 2)(x - 23)$
C4	$(2x + 3)(2x - 1) + 4x^2 + 12x + 9 = (2x+3)(2x-1) + (2x)^2 + 2 \times 2x \times 3 + 3^2 = (2x + 3)(2x - 1) + (2x + 3)^2 = (2x + 3)(2x - 1) + (2x + 3)(2x + 3) = (2x + 3)[2x - 1 + 2x + 3] = (2x + 3)(4x + 2)$
C5	$(6x - 1)^2 - (7x + 2)^2 = [6x-1 - (7x+2)][6x-1 + 7x+2] = (6x-1-7x-2)(6x-1+7x+2) = (-x-3)(13x+1)$

C6	$4x^2 - 9 + (2x + 3)(x - 5) = (2x)^2 - 3^2 + (2x + 3)(x - 5) = (2x+3)(2x-3) + (2x+3)(x-5) = (2x+3)[2x-3+x-5] = (2x + 3)(3x - 8)$
C7	$(x + 4)(-2x + 1) - 3(x + 4)^2 = (x + 4)(-2x + 1) - 3(x + 4)(x + 4) = (x + 4)[-2x + 1 - 3(x+4)] = (x + 4)(-2x+1-3x-12) = (x+4)(-5x-11)$
C8	$(x + 5)^2 - (x + 5) = (x + 5)(x + 5) - 1 \times (x + 5) = (x + 5)[x + 5 - 1] = (x + 5)(x + 4)$
C9	$(2x - 3)^2 - 64x^2 = (2x - 3)^2 - (8x)^2 = [2x-3 - 8x][2x-3 + 8x] = (-6x - 3)(10x - 3)$
C10	$100x^2 + 100x + 25 - (10x+5)(x+7) = (10x)^2 + 2 \times 10x \times 5 + 5^2 - (10x+5)(x+7) = (10x+5)^2 - (10x + 5)(x + 7) = (10x+5)(10x+5) - (10x+5)(x+7) = (10x + 5)[10x+5 - (x+7)] = (10x+5)(10x+5 - x-7) = (10x+5)(9x-2)$

C11	$(-2x + 3)^2 - (x - 9)^2 = [-2x+3 - (x-9)][-2x+3 + x-9] = (-2x + 3 - x + 9)(-2x + 3 + x - 9) = (-3x + 12)(-x - 6)$
C12	$(x + 3)^2 - 25(3x + 4)^2 = (x+3)^2 - 5^2 \times (3x+4)^2 = (x+3)^2 - [5 \times (3x + 4)]^2 = (x+3)^2 - [15x + 20]^2 = [x+3 - (15x+20)][x+3 + 15x+20] = (x + 3 - 15x - 20)(x + 3 + 15x + 20) = (-14x - 17)(16x + 23)$
C13	$x^2 - 9 - (2x + 5)(x - 3) + 5x - 15 = x^2 - 3^2 - (2x+5)(x-3) + 5 \times (x-3) = (x-3)(x+3) - (2x+5)(x-3) + 5 \times (x-3) = (x-3)[x+3 - (2x+5) + 5] = (x-3)(x+3 - 2x-5 + 5) = (x-3)(-x+3) = (x-3)(-1)(x-3) = -(x-3)^2$
C14	$x^2 - 16 + (x + 4)^2 = x^2 - 4^2 + (x+4)(x+4) = (x-4)(x+4) + (x+4)(x+4) = (x + 4)[x - 4 + x + 4] = (x + 4)(2x) = 2x(x + 4)$
C15	$(2x + 7)^2 + 10x + 35 = (2x + 7)(2x + 7) + 5 \times (2x + 7) = (2x + 7)[2x + 7 + 5] = (2x + 7)(2x + 12)$