Corrigés: Factorisation

Exercice 16

a) $-16x^5 + x = -x(16x^4 - 1) = -x(4x^2+1)(4x^2-1) = -x(4x^2+1)(2x+1)(2x-1)$

($a^2-b^2 = (a+b)(a-b)$; $a^2-b^2 = (a+b)(a-b)$)

b) $-3z^4 + 6z^3 + 24z^2 = -3z^2(z^2 - 2z - 8) = -3z^2(z-4)(z+2)$

($(x+..)(x+..) = x^2 - .. + ..$)

c) $3x^3 - 18x^2 + 24x = 3x(x^2 - 6x + 8) = 3x(x-2)(x-4)$

($(x-..)(x-..) = x^2 - .. + ..$)

d) $x^4 - x^6 = x^4(1 - x^2) = x^4(1+x)(1-x)$

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

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

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

f) $2x^3y - 18xy = 2xy(x^2 - 9) = 2xy(x+3)(x-3)$

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

g) $3x^2 + 2x - 8 = (3x^2 + 6x) + (-4x - 8)$

$3 \cdot (-8) = -24$ $\quad 6 \cdot (-4) = -24$ et $6 - 4 = 2$

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

h) $6x^2 + 13x + 6 = (6x^2 + 4x) + (9x + 6)$

$6 \cdot 6 = 36$ $\quad 4 \cdot 9 = 36$ et $4 + 9 = 13$

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

i) $36x^4 - 13x^2 + 1 = (36x^4 - 9x^2) + (-4x^2 + 1)$

$1 \cdot 6 = 36$ $\quad -4 \cdot (-9) = -36$ et $(-4) - 9 = -13$

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

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

j) $2a^2x - 15abx + 18b^2x = x(2a^2 - 15ab + 18b^2)$

$2 \cdot 18 = 36$ $\quad -3 \cdot (-12) = +36$ $\quad -3 - 12 = -15$

$= x[(2a^2 - 12ab) + (-3ab + 18b^2)] = x[2a(a - 6b) - 3b(a - 6b)]$

$= x(2a - 3b)(a - 6b)$