Chapitre 6

Act 1 / 2 : y théorie

Act 3 : 1) a) $(x+4)^2 = x^2 + 8x + 16$ d) $(1-7x)(1+7x) = 1 - 49x^2$

b) $(y-8)^2 = y^2 - 6y + 9$ e) $(3x-8)^2 = 9x^2 - 48x + 64$

c) $(k+6)(k-6) = k^2 - 36$ f) $(10y+3)(10y-3) = 100y^2 - 9$

2) a) $(x+15)^2 - (x-15)^2 = x^2 + 30x + 225 - (x^2 - 30x + 225)$

$= x^2 + 30x + 225 - x^2 + 30x - 225$

$= 60x$

b) on pose $x = 1200$ dans a) :

$(1200+15)^2 - (1200-15)^2 = 60 \cdot 1200$

$1215^2 - 1185^2 = 72000$

mentalement !

c) $99^2 = (100-1)^2 = 10000 - 200 + 1 = 9801$

d) $102^2 = (100+2)^2 = 10000 + 200 + 4 = 10204$

e) $95 \cdot 105 = (100-5)(100+5) = 100^2 - 5^2$

$= 10000 - 25 = 9975$

f) $49^2 = (50-1)^2 = 50^2 - 100 + 1 = 2500 - 100 + 1 = 2401$

g) $1001 \cdot 999 = (1000+1)(1000-1) = 1000^2 - 1^2$

$= 1000000 - 1 = 999999$

3) a) $(x^2+2)^2 = x^4 + 4x^2 + 4$

b) $(2x+1)^2 + (2x-1)^2 - 8x^2 = (4x^2 + 4x + 1) + (4x^2 - 4x + 1) - 8x^2$

$= 16x^2 + 2$

c) $2(3t-5)^2 - 2(1-4t)^2 = 2(9t^2 - 30t + 25) - 2(1 - 8t + 16t^2)$

$= 18t^2 - 60t + 50 - 2 + 16t - 32t^2$

$= -14t^2 - 44t + 48$

Act 4 : 1 a) $ka + kb = k(a+b)$

$k(a-b) = k(a-b)$

b) la mise en évidence / une factorisation / un facteur

c) A : 7 ; B : y ; C : a ; D : 3m

E : $(7x+5)$; F : $(3x-5)$

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

$B = y(8-7) = y \cdot 1 (= y)$

$C = a(6b+5)$

$D = 3m(2-3m)$

$E = (7x+5)[(3x+2)+(x-9)] = (7x+5)(4x-7)$

$F = (3x-5)[(x-4)-(8x+7)] = (3x-5)(-7x-11)$

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

b) $1 - y^2 = (1-y)(1+y)$

c) $100x^2 - 9 = (10x-3)(10x+3)$

d) $36 - 81z^2 = (6-9z)(6+9z)$

e) $4\pi^2 - 25 = (2\pi - 5)(2\pi + 5)$

f) $(t+3)^2 - 16 = [(t+3)-4][(t+3)+4] = (t-1)(t+7)$

g) $(2x+1)^2 - 25 = [(2x+1)-5][(2x+1)+5] = (2x-4)(2x+6)$

$\rightarrow (= 2(x-2) \cdot 2(x+3) = 4(x-2)(x+3))$

si on demande de factoriser le plus possible

h) $(3i+7)^2 - (i+5)^2 = [(3i+7)-(i+5)][(3i+7)+(i+5)]$

$= (2i+2)(4i+12)$

$\rightarrow (= 2(i+1) \cdot 4(i+3) = 8(i+1)(i+3))$

3 a) $t^2 + 81 + 18t = t^2 + 18t + 81 = (t+9)^2$

b) $4x^2 - 4xy + y^2 = (2x-y)^2$

c) $81 + 16y^2 - 72y = 16y^2 - 72y + 81 = (4y-9)^2$

d) $x^2 + 36 - 12x = x^2 - 12x + 36 = (x-6)^2$

e) $\frac{4}{9}p^2 + \frac{4}{3}p9 + 9^2 = \left(\frac{2}{3}p + 9\right)^2$

f) $\pi^2 + 10\pi + 25 = (\pi + 5)^2$

g) $x^2 + 12x + 20 = (x + 10)(x + 2)$

h) $x^2 + 3x + 2 = (x + 2)(x + 1)$

i) $x^2 - 3x + 2 = (x - 2)(x - 1)$

j)* $2x^2 + 5x + 3 = (2x + 3)(x + 1)$

k)* $2x^2 + 7x + 3 = (2x + 1)(x + 3)$

l)** $2x^2 + 2x + 3$ no factorizable

Act 6

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