Rappel : Identités remarquables :

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

Exercice 1

a. $\left(x+\sqrt{2}\right)^2 = x^2 + 2\sqrt{2}x + 2$

b. $(3x-5)^2 = 9x^2 - 30x + 25$

c. $\left(\sqrt{6}x-1\right)^2 = 6x^2 - 2\sqrt{6}x + 1$

d. $(3x+4)^2 = 9x^2 + 24x + 16$

e. $\left(x-2\sqrt{3}\right)\left(x+2\sqrt{3}\right) = x^2 - 12$

f. $\left(2x-\sqrt{5}\right)\left(2x+\sqrt{5}\right) = 4x^2 - 5$

Exercice 2

a. $(x-1)^2 + (2x-3)(2x+3) = \left(x^2 - 2x + 1\right) + \left(4x^2 - 9\right) = 5x^2 - 2x - 8$

b. $(x+2)^2 - (2x-1)^2 = \left(x^2 + 4x + 4\right) - \left(4x^2 - 4x + 1\right) = -3x^2 + 8x + 3$

c. $(x+5)(x-3) + (x+1)(x-1) = \left(x^2 + 2x - 15\right) + \left(x^2 - 1\right) = 2x^2 + 2x - 16$

d. $(2x-1)^2 - (x+3)^2 = \left(4x^2 - 4x + 1\right) - \left(x^2 + 6x + 9\right) = 3x^2 - 10x - 8$

e. $\left(x+\sqrt{5}\right)\left(x-\sqrt{5}\right) - (x-3)^2 = \left(x^2 - 5\right) - \left(x^2 - 6x + 9\right) = 6x - 14$

f. $(x-5)^2 - (x-2)(3x+1) = \left(x^2 - 10x + 25\right) - \left(3x^2 - 5x - 2\right) = 2x^2 - 5x + 27$

Exercice 3

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

b. $x^2 + 2x + 1 = (x+1)^2$

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

d. $4x^2 - 5 = \left(2x-\sqrt{5}\right)\left(2x+\sqrt{5}\right)$

e. $2x^2 + 12x + 18 = 2\left(x^2 + 6x + 9\right) = 2(x+3)^2$

f. $25x^2 - 10x + 1 = (5x-1)^2$

g. $36x^2 - (2-5x)^2 = (11x-2)(x+2)$

h. $-2x^2 + 12x - 18 = -2(x-3)^2$

i. $81x^2 - 729 = (9x-27)(9x+27)$

j. $24x^2 + 24x + 6 = 6(2x+1)^2$

k. $-12x^2 + 36x - 27 = -3\left(4x^2 - 12x + 9\right) = -3(2x-3)^2$

l. $100 - 40x + 4x^2 = (10-2x)^2$