EXERCICE N°1

Développer les expressions suivantes à l'aide des identités remarquables :

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

$D=(2x-7)^2$; $E=(3+2x)^2$; $F=(11-a)(11+a)$

$G=(3x+1)^2$; $H=(7x-3)^2$; $I=(x-3)(x+3)$;

EXERCICE N°2

Factoriser les expressions suivantes :

$A=x^2+6x+9$; $B=25x^2-40x+16$; $C=-9+30x-25x^2$

$D=169x^2-4$; $E=(2x-1)^2-(2-3x)^2$; $F=4x^2-(x-3)^2$

$G=(5x+8)^2-25$; $H=25-(3x-2)^2$

EXERCICE N°3

Développer les produits remarquables suivants :

$A=(x+1)^3$; $B=(x+2)^3$; $C=(2x+5)^3$; $D=(3x+1)^3$

$E=(x-1)^3$; $F=(x-2)^3$; $G=(2x-5)^3$; $H=(3x-1)^3$

EXERCICE N°4

Factoriser les expressions suivantes :

$A=x^3+1$; $B=x^3+27$; $C=(3x+1)^3+(x-2)^3$;

$D=A=8x^3-27$; $E=(x-1)^3-1$; $F=(x-1)^3-8$;

$G=(x-2)^3-8$;

EXERCICE N°5

Factoriser les expressions suivantes:

$A=(x+1)(x+2)-5(x^2+4x+4)$; $B=3(2x+1)+4x^2-1$; $C=x^2-9+(x+3)(x^2-9)$

$D=9x^2-4-(3x-2)(9x-4)$; $E=x^2-2x+1-(x-2)^2$; $F=25-9x^2-(1-x)(3x-5)$

$G=4x^2-12x+9+(2x-3)(x^2+4)$

Exercice 1

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

$B = (x-5)^2 = x^2 - 10x + 25$;

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

$D = (2x-7)^2 = 4x^2 - 28x + 49$;

$E = (3+2x)^2 = 9 + 12x + 4x^2$;

$F = (11-a)(11+a) = 121 - a^2$

$G = (3x+1)^2 = 9x^2 + 6x + 1$;

$H = (7x-3)^2 = 49x^2 - 42x + 9$;

$I = (x-3)(x+3) = x^2 - 9$

Exercice 2

$A=x^2+6x+9=(x+3)^2$;

$B=25x^2 -40x+16=(5x-4)^2$;

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

$D=169x^2 -4=(13x-2)(13x+2)$;

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

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

$G=(5x+8)^2 -25 =(5x+8-5)(5x+8+5)=(5x+3)(5x+13)$;

$H=25-(3x-2)^2 =(5-(3x-2))(5+(3x-2))=(7-3x)(3+3x)= 3(7-3x)(1+x)$

Exercice 3

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

$B=(x+2)^3 = x^3 +6x^2 +12x+8$

$C=(2x+5)^3 = 8x^3 +60x^2 +150x+125$

$D= (3x+1)^3 =9x^3 +27x^2 +9x+1$

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

$F=(x-2)^3 = x^3 -6x^2 +12x-8$

$G=(2x-5)^3 =8x^3 -60x^2 +150x-125$

$H=(3x-1)^3 =9x^3 -27x^2 +9x-1$

Exercice 4

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

$B = x^3 + 27 = (x+3)(x^2 - 3x + 9)$

$C = (3x+1)^3 + (x-2)^3 = (3x+1+x-2)\left((3x+1)^2 + (3x+1)(x-2) + (x-2)^2\right)$

$= (4x-1)(9x^2 + 6x + 1 + 3x^2 - 6x + x - 2 + x^2 - 4x + 4) = (4x-1)(13x^2 - 3x + 3)$

$D = 8x^3 - 27 = (2x)^3 - (3)^3 = (2x-3)((2x)^2 + 6x + 9) = (2x-3)(4x^2 + 6x + 9)$

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

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

$F = (x-1)^3 - 8 = ((x-1) - 2)[(x-1)^2 + 2(x-1) + 2^2)] = ((x-1) - 2)[(x-1)^2 + 2(x-1) + 2^2)]$

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

$G = (x-2)^3 - 8 = (x-2)^3 - 2^3 = (x-2-2)[(x-2)^2 + 2(x-2) + 4]$

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

Exercice 5

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

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

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

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

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

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

$= (3x-2)(3x+2) - (9x-4)) = (3x-2)(-6x+6)$

$= 6(3x-2)(-x+1)$

$E = x^2 - 2x + 1 - (x-2)^2 = (x-1)^2 - (x-2)^2 = (x-1-(x-2))(x-1+x-2)$

$= 1(2x-3) = 2x-3$

$F = 25 - 9x^2 - (1-x)(3x-5) = (3x-5)(3x+5) - (1-x)(3x-5)$

$= (3x-5)\left[(3x+5)-(1-x)\right] = (3x-5)(3x+5-1+x)$

$= (3x-5)(4x+4) \;= 4(3x-5)(x+1)$

$G = 4x^2 - 12x + 9 + (2x-3)(x^2+4) = (2x-3)^2 + (2x-3)(x^2+4)$

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

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