Identités Remarquables

Développer

$\boxed{M} = (2x-3)^3 - 3(2x+3)^2 - 2(2x+3)(2-x)(x+2)(3-2x)$

$\boxed{A} = (2 - x + x^2)^2$

$\boxed{T} = (x - 2 + x^2)(x^2 - x + 2)$

$\boxed{H} = (1 - x + x^2)^3$

Factoriser

$\boxed{F} = x^4 - 4x^2 + 4 - x^2$

$\boxed{L} = (2x-1)^2 - \frac{9}{4}$

$\boxed{Y} = x^2 + 4x - 5 = (x + \ldots)^2 - \ldots.$

$\boxed{E} = (2x+3)^2 - (1-x)^2$

$\boxed{R} = 16(x+2)^2 - 25(1-x)^2$

$\boxed{S} = \frac{3}{4}x^2 + 4x + 4 = (x + \ldots)^2 - \ldots.$

Développer-Factoriser

I) Développer les expressions algébriques

$\mathbf{A} = (2a^2 - 3ab + 5b^2)(-3a^2 + 4ab - 2b^2)$

$= -6a^4 + 9a^3b - 15a^2b^2 + 8a^3b - 12a^2b^2 + 20ab^3 - 4a^2b^2 + 6ab^3 - 10b^4$

$\boxed{\mathbf{= -6a^4 + 17a^3b - 31a^2b^2 + 26\,ab^3 - 10b^4}}$

$\mathbf{B} = (1 + X - X^2)(1 - X + X^2)$

$= 1 + X - X^2 - X - X^2 + X^3 + X^2 + X^3 - X^4$

$\boxed{\mathbf{= 1 - X^2 + 2X^3 - X^4}}$

$\mathbf{C} = (2X^2 - 3X + 1)(X^2 + X - 1) \mathbf{-2}(1 + X)(3 - 2X)(1 - X + X^2)$

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

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

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

$= 2X^4 - X^3 - 4X^2 + 4X - 1 + 4X^4 - 6X^3 + 4X - 6$

$\boxed{\mathbf{= 6X^4 - 7X^3 - 4X^2 + 8X - 7}}$

$\mathbf{D} = (2X + X^2 - 3 + 2X^3)(3 + 2X^3 - 2X + X^2)$

$= 6X + 3X^2 - 9 + 6X^3 + 4X^4 + 2X^5 - 6X^3 + 4X^6 - 4X^2 - 2X^3 + 6X - 4X^4 + 2X^3 + X^4 - 3X^2 + 2X^5$

$\boxed{\mathbf{= 4X^6 + 4X^5 + X^4 - 4X^2 + 12X - 9}}$

$\mathbf{E} = (3a^2 - 4a + 2)^2 = (3a^2 - 4a + 2)(3a^2 - 4a + 2)$ Développer les produits

$\boxed{\mathbf{= 9a^4 - 24a^3 + 28a^2 + 8X - 16a + 4}}$

II) Factoriser les sommes suivantes

$\mathbf{A} = 5X - 3Y - 5X^2 + 3XY$

$= 5X(1 - X) - 3Y(1 - X)$

$= (1 - X)(5X - 3Y)$

$\mathbf{B} = 4X^2 + 8XY - 3AX - 6AY$

$= 4X(X + 2Y) - 3A(X + 2Y)$

$= (X + 2Y)(4X - 3A)$

$\mathbf{C} = X^2 + 4X + 3 = (X^2 + X) + (3X + 3)$

$= X(X + 1) + 3(X + 1)$

$= (X + 1)(X + 3)$

$\mathbf{D} = 15X^2 + 11X + 2 = (15X^2 + 5X) + (6X + 2)$

$= 5X(3X + 1) + 2(3X + 1)$

$= (3X + 1)(5X + 2)$

IDENTITES REMARQUABLES

I)Développer

$(2x^2 - 4x + 3)^2 = 4x^4 - 16x^3 + 28x^2 - 24x + 9$

$(2x^2 - 2x + 3)^3 = 8x^6 - 24x^5 + 60x^4 - 80x^3 + 90x^2 - 54x + 27$.

$(2x^3 + x^2 - 3x + 1)^2 = 4x^6 + 4x^5 - 11x^4 - 2x^3 + 11x^2 - 6x + 1$

$(x^3 - 2x^2 + 3x - 1)(x^3 - 2x^2 - 3x + 1) = x^6 - 4x^5 + 4x^4 - 9x^2 + 6x - 1$

II)Factoriser

$32x^4 - 162x^8 = -2x^4(3x - 2)(3x + 2)(9x^2 + 4)$

$(2x^2 - 8) - (x - 2)^2 - 5x + 10 = (x + 1)(x - 2)$

$(7x + 1)^2 - (3x - 4)^2 = (4x + 5)(10x - 3)$

$x^2 - 4x - 21 = (x^2 - 4x + 4) - 25 = (x + 3)(x - 7)$

$x^2 + 6x - 7 = (x^2 + 6x + 9) - 16 = (x + 7)(x - 1)$

$(4x^2 - 4x + 1) - (9x^2 - 24x + 16) = -5(x - 1)(x - 3)$

IDENTITES REMARQUABLES

I) Développer les expressions

1) $(2x-3)^2-(2-x)^2 = 3x^2-8x+5$

2) $\left(2a-3b+\frac{1}{2}c\right)\left(2a-3b-\frac{1}{2}c\right) = 4a^2-12ab+9b^2-\frac{1}{4}c^2$

3) $(5x-3y+2z)(5x+3y-2z) = 25x^2-9y^2+12yz-4z^2$

4) $\left(3x^2-2x+\frac{3}{2}\right)^2 = 9x^4-12x^3+13x^2-6x+\frac{9}{4}$

5) $\left(\frac{1}{2}x-6y+\frac{2}{3}\right)^2 = \frac{1}{4}x^2-6xy+\frac{2}{3}x+36y^2-8y+\frac{4}{9}$

6) $(2x+3y)^3 = 8x^3+36x^2y+54xy^2+27y^3$

7) $(2a^2-5ab^3)^3 = 8a^6-60a^5b^3+150a^4b^6-125a^3b^9$

8) $(1+x-x^2)^3 = 1+3x-5x^3+3x^5-x^6$

II) Factoriser les expressions

1) $(3x-1)^2-(18x^2-2) = -3(x+1)(3x-1)$

2) $(2a-3b)^2-(6a-5b)^2 = -16(2a-b)(a-b)$

3) $48x^3y^2-120x^2y^3+75xy^4 = 3xy^2(4x-5y)^2$

4) $(4-4x+x^2)-\frac{1}{4}x^2 = \frac{1}{4}(3x-4)(x-4)$

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

6) $(5x^2+12x+8)^2-(3x^2+10+12x)^2 = 4(x-1)(x+1)(3+2x)^2$

(I) FACTORISER les expressions

1) $4a^2b-6ab^2+2ab$

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

3) $2x^2-x^3+8-4x$

4) $16x^2-9-(4x+3)^2$

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

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

7) $(x^2-4x+4)-4x^2+12x-9$

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

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

10) $x^2-8x+7=(x-4)^2-?$

(II) Simplifier les fractions

1) $\dfrac{4x^2-9}{4x^2+12x+9}$

2) $\dfrac{x^4-16}{(x^3-2x^2)+(4x-8)}$

3) $\dfrac{9x^2-(1-2x)^2}{x^2+x}$

4) $\dfrac{2x^2+x-6}{x^2+4x+4}$

5) $\dfrac{x^2+2x-3}{x^2-8x+7}$