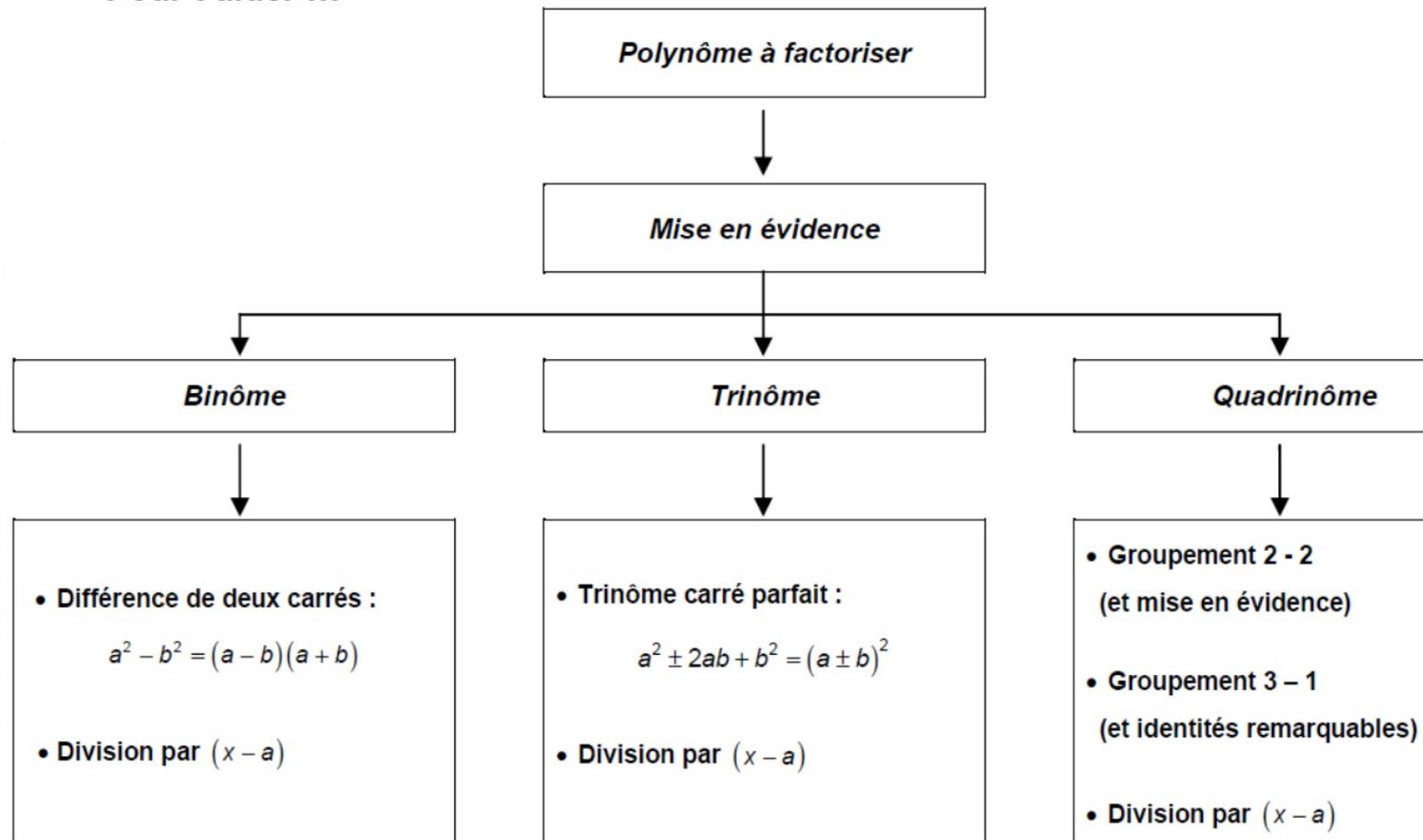
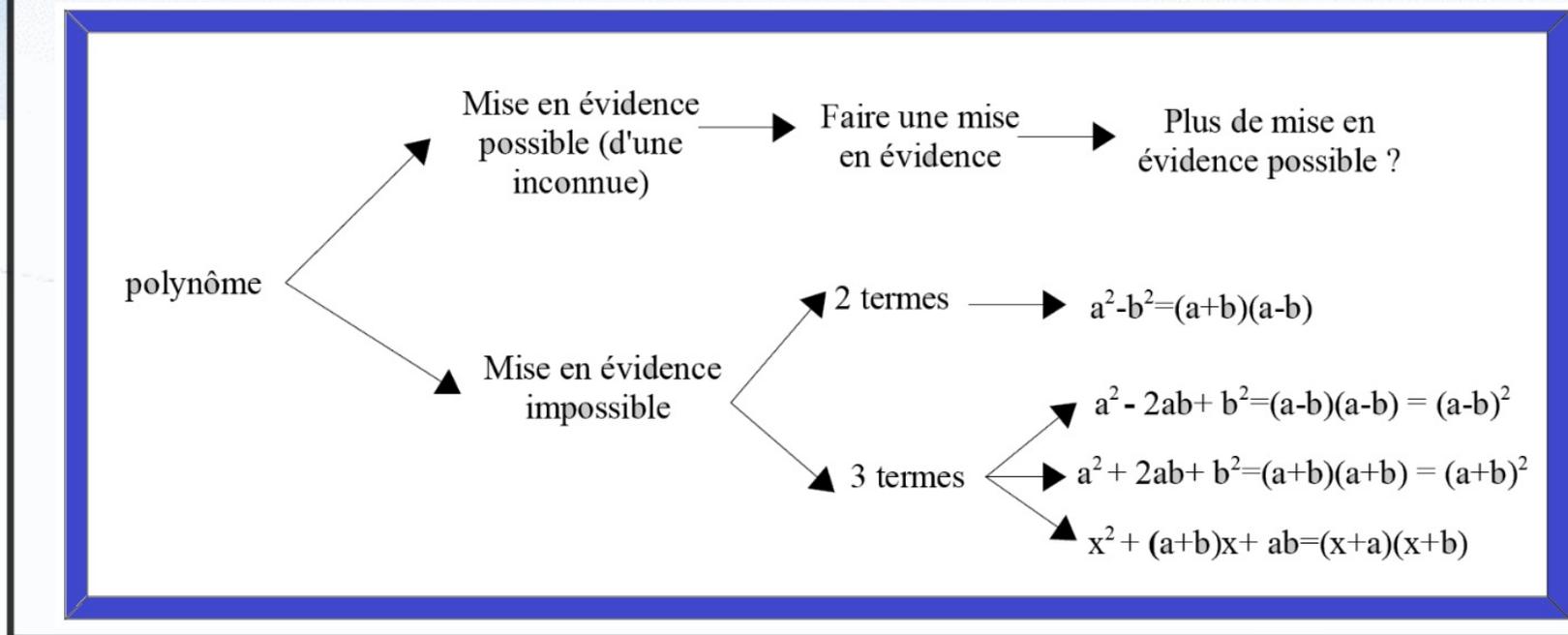


Arbre à factorisation

Pour t'aider ...



Arbre à factorisation



Mets en évidence les facteurs communs

Colonne 1

$$\underline{4x} + \underline{4y} = 4(x+y)$$

$$\underline{3ab} - \underline{2ac} = a(3b-2c)$$

$$\underline{6a} + \underline{9} = 3(2a+3)$$

$$\underline{45x} - \underline{18y} = 9(5x-2y)$$

$$\underline{8a} - \underline{8} = 8(a-1)$$

Colonne 3

$$\underline{3a^2} - \underline{5a} = \underline{3a}a - \underline{5a} = a(3a-5)$$

$$\underline{7a^5} - \underline{5a^3} = a^3(7a^2-5)$$

$$\underline{8a^2} - \underline{12a} = 4a(2a-3)$$

$$\underline{-18a^2} + \underline{27a^6} = 9a^2(-2+3a^4)$$

$$\underline{4a^3} - \underline{6a^2} + \underline{2a} = 2a^2(2-3a)$$

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

Colonne 2

$$\underline{24a} - \underline{16} = 8(3a-2)$$

$$\underline{-6x} - \underline{6y} = -6(x+y)$$

$$\underline{-36} + \underline{48b} = 12(-3+4b)$$

$$\underline{-2a} - \underline{2b} + \underline{2} = 2(-a-b+1)$$

$$= -2(a+b-1)$$

$$\underline{-6} + \underline{3b} - \underline{3a} =$$

$$-3(2-b+a)$$

$$= 3(-2+b-a)$$

Colonne 4

$$\underline{24a^2b^2} + \underline{18ab^3} = 6ab^2(4a+3b)$$

$$\underline{35x^2y} + \underline{7xy} + \underline{21xy^2} = 7xy(5x+1+y)$$

$$\underline{4a^2b^3} - \underline{6ab^4} + \underline{2ab} = 2ab(2ab^2-3b^3+1)$$

$$\underline{15y^4} - \underline{12x^4y^6} + \underline{3x^6y^4} = 3y^4(5-4x^4+x^6)$$

$$\underline{-12a^2x^3} + \underline{30ax^2} =$$

$$= 6ax^2(-2ax+5)$$

Mets en évidence les facteurs communs

$$1) \underline{a \cdot (x-y)} + \underline{b \cdot (x-y)}$$

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

$$\underline{(x+y) \cdot a} + \underline{3 \cdot (x+y)}$$

$$= (x+y)(a+3)$$

$$\underline{b \cdot (a-x)} - \underline{(a-x) \cdot 1}$$

$$= (a-x)(b-1) \triangle$$

$$\underline{-b \cdot (y-x)} + \underline{a \cdot (y-x)}$$

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

$$= (y-x)(a-b)$$

$$\underline{(a^2+2bc) - x(a^2+2bc)}$$

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

$$2) \underline{3x \cdot (a-b)} - \underline{xy \cdot (a-b)}$$

$$= x(a-b)(3-y)$$

$$\underline{6a^2 \cdot (a+b)} + \underline{9a \cdot (a+b)}$$

$$= 3a(a+b)(2a+3)$$

$$\underline{(x-y)^2} + \underline{2 \cdot (x-y)}$$

$$= (x-y)(x-y+2)$$

$$\underline{7a \cdot (a+3)^2} - \underline{4a^2 \cdot (a+3)}$$

$$= a(a+3)(7(a+3) - 4a)$$

$$= a(a+3)(7a+21-4a)$$

$$= a(a+3)(3a+21)$$

$$= 3a(a+3)(a+7) \text{ ☺}$$

$$\underline{3 \cdot (x-y)} - \underline{5 \cdot (x-y)^2}$$

$$= (x-y)(3-5(x-y)) = (x-y)(3-5x+5y)$$

3) Mets en évidence les facteurs communs

$$\begin{aligned} & (a+b) \cdot (x+y) + (a+b) \cdot (3x-2y) \\ &= (a+b) (\underline{x+y} + \underline{3x-2y}) \\ &= (a+b) (4x-y) \end{aligned}$$

$$\begin{aligned} & (x-3) \cdot (2+a) - (4-3a) \cdot (x-3) \\ &= (x-3) (2+a - (4-3a)) \\ &= (x-3) (\underline{2+a} - \underline{4} + \underline{3a}) \\ &= (x-3) (\underline{4a} - \underline{2}) \\ &= 2(x-3)(2a-1) \\ & \ominus 2x \cdot (x-y) \ominus (3+y) \cdot (x-y) \end{aligned}$$

$$\begin{aligned} &= (x-y) (2x+3+y) \\ & \text{ou} \\ &= (y-x) (2x+3+y) \end{aligned}$$

$$\begin{aligned} & (a-3b) \cdot (3x-2) - 2 \cdot (a-3b) \\ &= (a-3b) (\underline{3x-2} - \underline{2}) \\ &= (a-3b) (3x-4) \end{aligned}$$

$$\begin{aligned} & 3x \cdot (x-3y) - (x+2) \cdot (x-3y) - (x-3y) \\ &= (x-3y) (3x - (x+2) - 1) \\ &= (x-3y) (\underline{3x} - \underline{x} - \underline{2} - \underline{1}) \\ &= (x-3y) (2x-3) \end{aligned}$$

4) Mets en évidence les facteurs communs

$$a \cdot (y-x) - b \cdot (-y+x)$$


$$y-x = -(-y+x)$$
$$= -(x-y)$$

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

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

$$2x \cdot (x-y) + 3y \cdot (y-x)$$

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

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

$$(c-d) \cdot x - (d-c) \cdot y$$

$$= (c-d)x + (c-d)y$$

$$= (c-d)(x+y)$$

$$5 \cdot (y-x) + a \cdot (x-y)$$

$$= 5(y-x) - a(y-x)$$

$$= (y-x)(5-a)$$

$$a \cdot (3a-b) + y \cdot (b-3a)$$

$$= a(3a-b) - y(3a-b)$$

$$= (3a-b)(a-y)$$

Exercices

nouvel actimath page 92 activité 2



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c) Mets en évidence les facteurs communs.

5) $(x - y) \cdot (3a - 1) - (y - x) \cdot (2a + 5)$

$- 3a \cdot (b - a) + (a + 2) \cdot (a - b)$

$(a + b - c) \cdot (3a - 2) + (a - 1) \cdot (c - b - a)$

$(x + y) \cdot (a - b) - (b - a) \cdot (x - y)$

$x \cdot (a - 3b) - y \cdot (3b - a) + (3b - a) \cdot (3x + y)$

6) $\underline{2x \cdot (x - y) - 3y \cdot (y - x)^2}$

$2 \cdot (-a + b) + a \cdot (a - b)^2$

$3x \cdot (x - y)^2 - 4 \cdot (y - x)^2$

$(a - b)^2 + 5 \cdot (a - b) + (b - a)^3$

$4 \cdot (a - b)^2 - 3 \cdot (b - a)^3$

$$\begin{aligned} (y-x)^2 &= y^2 - 2xy + x^2 \\ (x-y)^2 &= x^2 - 2xy + y^2 \end{aligned}$$

$$\begin{aligned} (y-x)^2 &= (y-x)(y-x) \\ &= -(x-y)(x-y) \\ &= -(x-y)^2 \end{aligned}$$

$$\boxed{\begin{aligned} (y-x)^2 &= y^2 - 2xy + x^2 \\ (x-y)^2 &= x^2 - 2xy + y^2 \end{aligned}}$$

$$\begin{aligned} (y-x)^2 &= (y-x)(y-x) \\ &= - (x-y)(x-y) \\ &= (x-y)^2 \end{aligned}$$

$$\begin{aligned} (y-x)^3 &= (y-x)^2 (y-x) \\ &= (x-y)^2 (y-x) \\ &= - (x-y)^2 (x-y) \\ &= - (y-x)^2 (x-y) \\ &= - (x-y)^3 \end{aligned}$$

5) Mets en évidence les facteurs communs

$$(x-y) \cdot (3a-1) - (y-x) \cdot (2a+5)$$

$$= (x-y)(3a-1) + (x-y)(2a+5)$$

$$= (x-y)(3a-1+2a+5)$$

$$= (x-y)(5a+4)$$

$$\ominus 3a \cdot (b-a) + (a+2) \cdot (a-b)$$

$$= 3a(a-b) + (a+2)(a-b)$$

$$= (a-b)(3a+a+2)$$

$$= (a-b)(4a+2)$$

$$= 2(a-b)(2a+1)$$

$$(a+b-c) \cdot (3a-2) + (a-1) \cdot (c-b-a)$$

$$= (a+b-c)(3a-2) - (a-1)(a+b-c)$$

$$= (a+b-c)(3a-2-(a-1))$$

$$= (a+b-c)(3a-2-a+1)$$

$$= (a+b-c)(2a-1)$$

$$(x+y) \cdot (a-b) - (b-a) \cdot (x-y)$$

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

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

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

$$x \cdot (a-3b) - y \cdot (3b-a) + (3b-a) \cdot (3x+y)$$

$$= (3b-a)(-x-y+3x+y)$$

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

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

6) $2x \cdot (x - y) - 3y \cdot (y - x)$ (2) Mets en évidence les facteurs communs

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

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

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

$$2 \cdot (-a + b) + a \cdot (a - b)^2$$

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

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

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

$$3x \cdot (x - y)^2 - 4 \cdot (y - x)^2$$

$$= 3x(x - y)^2 - 4(y - x)^2$$

$$= (x - y)^2(3x - 4)$$

$$(a - b)^2 + 5 \cdot (a - b) + (b - a)^3$$

$$= (a - b)^2 + 5(a - b) - (a - b)(a - b)^2$$

$$= (a - b)(a - b + 5 - (a - b)^2)$$

$$= (a - b)(a - b + 5 - a^2 + 2ab - b^2)$$

$$4 \cdot (a - b)^2 - 3 \cdot (b - a)^3$$

$$= 4(b - a)^2 - 3(b - a)^3$$

$$= (b - a)^2(4 - 3(b - a))$$

$$= (b - a)^2(4 - 3b + 3a)$$

