2.3.1 2.3.19

2.3.8

2.3.10

2.3.11

2.3.12

2.3.18

2.3.23

2.3.26

ALGÈBRE

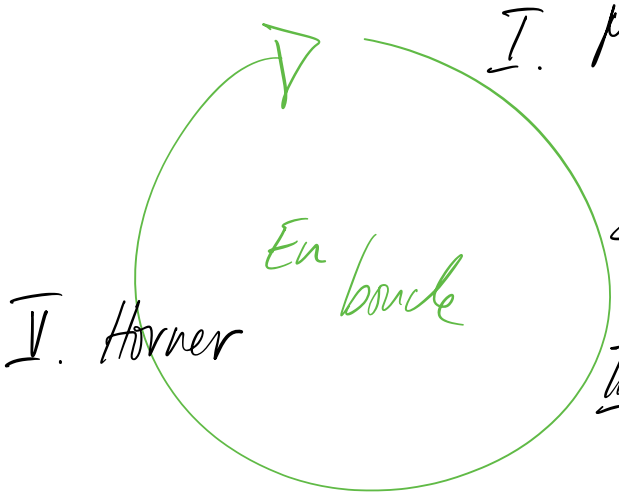
Division euclidienne

Schéma de Horner

↓

Factorisation

2.4.1 à 2.4.5



I. Mise en évidence

II. Identités remarquables

III. Trinôme
(somme - produit / Viète)

IV. Groupements

V. Horner

Dividir x^3-1 por $x-1$

x^3+0x^2+0x-1

Horner: P(x) | x-a

Horner:

	1	0	0	−1
1		1	1	1
	1	1	1	0

x^2+x+1 resto 0

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

$x^8+x^4+1 \;\big|\; x^2-x+1$

$x^8+0x^7+0x^6+0x^5+x^4+0x^3+0x^2+1 \;\big|\; x^2-x+1$

$x^8-x^7+x^6$ | x^6

x^7-x^6

$x^5+1 = x^5+0x^4+0x^3+0x^2+0x+1$

$x^5+1 \mid x+1$

x^5	x^4	x^3	x^2	x	
1	0	0	0	0	1

-1

x	1
1	1

-1

$x+1 \mid x+1$

$x^4-3x^3+0x^2+x-5 \mid x^2+0x-3$

$x^4+0x^3-3x^2 \mid x^2$

$-3x^3+3x^2$

$P(x)$

$x^4-10x^3+35x^2-50x+24$ ← FACTORISER

TERME CONSTANT

$24 = 2\cdot 12 = 2\cdot 2\cdot 2\cdot 3$

$D_{24} = \{\pm 1; \pm 2; \pm 3; \pm 4; \pm 6; \pm 8; \pm 12; \pm 24\}$

« Tâtonnement structuré »

Horner avec $x-1$ / $x+1$ / $x-2$ / $x+2$ / $x-3$ / $x+3$ / ...

	1	−10	35	−50	24
1		1	−9	26	−24
	1	−9	26	−24	0

$P(x) = (x^3 - 9x^2 + 26x - 24)(x-1) + 0 = x^4 - 10x^3 + 35x^2 - 50x + 24$

	1	−9	26	−24
1		1	−8	18
	1	−8	18	−6

ÉCHEC $x-1$

	1	−9	26	−24
−1		−1	10	−36
	1	−10	36	−60

ÉCHEC $x+1$

	1	−9	26	−24
2		2	−14	24
	1	−7	12	0

YESSS $x-2$

$$P(x) = (x^2-7x+12)(x-2)(x-1) = (x-3)(x-4)(x-2)(x-1)$$

$$(x^3-9x^2+26x-24)(x-1)$$

$$x^4-10x^3+35x^2-50x+24$$

$$x^2-7x+12$$

$$\Delta = 49-48 = 1$$

$$x = \frac{7\pm 1}{2} = \begin{cases} 4 \\ 3 \end{cases}$$

$$(x-4)(x-3)$$

$$ax^2+bx+c = a(x-x_1)(x-x_2)$$

$$x_1 = \frac{-b+\sqrt{\Delta}}{2a} \qquad x_2 = \frac{-b-\sqrt{\Delta}}{2a}$$

$$\Delta = b^2-4ac$$