

Polynômes (2.1.6 et 2.1.8)

P, q lettres

P est un polynôme

$$P = a_0 + a_1 X + a_2 X^2 + a_3 X^3 + \dots + a_n X^n \quad a_i \in \mathbb{R}$$

$$P = 1 + 2X + 3X^2 = 3X^2 + 2X + 1 \quad 1, 2, 3 \in \mathbb{R}$$

$$q = \sqrt{2} + \sqrt{3}X + \sqrt{5}X^3 = \sqrt{2} + \sqrt{3}X + 0X^2 + \sqrt{5}X^3$$

$$r = X^{18}$$

Opérateurs: P, q deux polynômes

$$P + q$$

$$P - q$$

$$P \cdot q$$

$$p = 1 - 2x + 3x^2 - 4x^3 + 5x^4$$

degré 4

$$q = 2 - x - x^2 - x^3 + 3x^4$$

Calculer $p \cdot q$

Coefficient du terme de plus haut degré: 15
de degré 5:

$\nearrow$	1	$-2x$	$3x^2$	$-4x^3$	$5x^4$
2	2	$-4x$			
$-x$					$-5x^5$
$-x^2$				$4x^5$	
$-x^3$			$-3x^5$		
$3x^4$		$-6x^5$			$15x^8$

degré 5

$$p \cdot q = (1 - 2x + \dots)(2 - x - \dots)$$

2.1.9 b)

$$\begin{aligned} & \cancel{\frac{1}{2}x^3} - \cancel{\frac{1}{6}x^2y} - \cancel{x^3} + \cancel{\frac{1}{8}xy^2} + \cancel{\frac{1}{10}y^3} + \cancel{\frac{1}{2}x^3} - \cancel{\frac{1}{2}x^2y} + \cancel{\frac{1}{8}xy^2} + \cancel{\frac{1}{10}y^3} \\ & + \cancel{\frac{2}{3}x^2y} + \cancel{\frac{3}{4}xy^2} + \cancel{\frac{4}{5}y^3} = xy^2 + y^3 \end{aligned}$$

$$\frac{1}{2}x^3 - x^3 + \frac{1}{2}x^3 = \left(\frac{1}{2} - 1 + \frac{1}{2}\right)x^3 = 0 \cdot x^3 = 0$$

$$\frac{1}{2} - \frac{2}{2} + \frac{1}{2}$$

$$\left(-\frac{1}{6} - \frac{1}{2} + \frac{2}{3}\right)x^2y = \left(-\frac{1}{6} - \frac{3}{6} + \frac{4}{6}\right)x^2y = 0 \cdot x^2y = 0$$

$$\left(\frac{1}{8} + \frac{1}{8} + \frac{3}{4}\right)xy^2 = xy^2$$

$$\left(\frac{1}{10} + \frac{1}{10} + \frac{4}{5}\right)y^3 = y^3$$