

## 2. Résolution d'équations

$$\begin{array}{l} 1^{\text{e}} \text{ degré : } ax + b = 0 \quad | \text{ isoler } x \\ \quad \quad \quad ax = -b \\ \quad \quad \quad x = -\frac{b}{a} \end{array}$$

$$\begin{array}{l} 2^{\text{e}} \text{ degré : } ax^2 + bx = -c \quad | = 0 \\ \quad \quad \quad ax^2 + bx + c = 0 \\ \quad \quad \quad \text{on résout avec } \Delta = \dots \end{array}$$

$$\begin{array}{l} \text{degré } > 2 : \text{ m.à.s. : } \\ \quad \quad \quad 1) = 0 \\ \quad \quad \quad 2) \text{ factoriser} \\ \quad \quad \quad 3) \text{ propriété du produit nul : } A \cdot B = 0 \Leftrightarrow A = 0 \text{ ou } B = 0 \end{array}$$

$$\begin{array}{l} \text{Exemples: } 1) \quad -2x^2 = x^3 + x \\ \quad \quad \quad 0 = x^3 + 2x^2 + x \end{array}$$

$$x^3 + 2x^2 + x = 0$$

$$x(x^2 + 2x + 1) = 0$$

Mee

$$x(x+1)^2 = 0$$

PR

$$x = 0 \text{ ou } (x+1)^2 = 0$$

$$x+1 = 0$$

$$x = -1$$

$$\Rightarrow S = \{-1; 0\}$$

$$2) \quad x^4 + x^3 = 27x + 27$$

$$\underline{x^4 + x^3} - \underline{27x - 27} = 0$$

Gr

$$x^3(x+1) - 27(x+1) = 0$$

$$(x+1)(x^3 - 27) = 0$$

PR

$$(x+1)(x-3)(\underbrace{x^2+3x+9}) = 0$$

$$\begin{array}{ccc} \swarrow & & \downarrow \\ -1 & & 3 \end{array} \quad \Delta = 9 - 4 \cdot 9 < 0$$

$$\Rightarrow S = \{-1; 3\}$$

$$\begin{array}{ccc} x^2(x+1)(x^2-9) & & \\ \swarrow & \downarrow & \swarrow \quad \downarrow \\ 0 & -1 & (x+3)(x-3) \\ & & \downarrow \quad \downarrow \\ & & -3 \quad 3 \end{array}$$

$$\Rightarrow S = \{0; -1; 3; -3\}$$