

- Recall the definition of a unit and of an irreducible element in a ring. Example: $K[x]$.
- Irreducibility of polynomials over a field K ; degree :
 - 0, reducible (unit)
 - 1, irreducible
 - 2, irreducible if and only if no root in K ;
solving the quadratic equation, discriminant Δ . Criterion for irreducibility: Δ not a square in K ;
 - 3, irreducible if and only if no root;
 - ≥ 4 , examples of $(x^2 + 1)^2$, $(x^2 + 1)(x^2 + 2)$ reducible in $\mathbb{R}[x]$ but no root in \mathbb{R} .
- Recall : irreducibility in $\mathbb{Z}[x]$.
- Existence of an algorithm for the irreducibility in $\mathbb{Z}[x]$.
- Reduction modulo p of a polynomial f in $\mathbb{Z}[x]$. If one reduction modulo a prime p is irreducible and of the same degree as f , then f is irreducible over \mathbb{Z} .