

## Algebraically Closed Fields

**Definition** (Algebraically Closed Field) A field  $\mathbb{F}$  is called *algebraically closed* if every non-constant polynomial with coefficients in  $\mathbb{F}$  has a root in  $\mathbb{F}$ .

- Are the fields of rational numbers  $\mathbb{Q}$  and real numbers  $\mathbb{R}$  algebraically closed?

**Theorem** (Fundamental Theorem of Algebra) The field of complex numbers  $\mathbb{C}$  is algebraically closed.

- Find at least two different proofs of the Fundamental Theorem of Algebra.

Please send your favorite proofs to “ayse.bilge@khas.edu.tr”.

## References

- [1] Palka, B. P. (1991). An introduction to complex function theory. Springer Science & Business Media.