

Example of alg closed field

$$\textcircled{1} \quad \overline{\mathbb{Q}} \stackrel{\pi}{\subset} \mathbb{C} \stackrel{t}{\subset} \bigcup_n \mathbb{C}((t^{\frac{1}{n}})) = \overline{\mathbb{C}((t))} \quad \mathbb{C}[[t]]$$

Puisseux series

$$\bigcap \mathbb{Q}_p \stackrel{\mathbb{Z}_p}{\subset} \mathbb{C}_p$$

$$\textcircled{2} \quad \text{char } K = p: \quad \overline{\mathbb{F}_q} = \overline{\mathbb{F}_p} \quad (\text{Gal}(\overline{\mathbb{F}_q}/\overline{\mathbb{F}_p}) = \widehat{\mathbb{Z}})$$

Task. $\textcircled{1}$ Prove they are alg closed. $(\mathbb{C}, \bigcup_n \mathbb{C}((t^{\frac{1}{n}})), \mathbb{C}_p)$
 $\textcircled{2}$ Find an element in each "c".