

Comments on Tutorial 9 Exercises and Solutions

1. The hint to use part (i) was not necessarily helpful.

More helpful would be to reiterate the observation made in the Comments for Tutorial 8:

Observation Let $K : F$ be a field extension.

Suppose $\alpha \in K$ is a root of a *monic* polynomial $p(x) \in F[x]$ and $p(x)$ is irreducible in $F[x]$. Then α is algebraic over F and $p(x) = m_{\alpha, F(x)}$, the minimal polynomial of α over F .

In part (ii) we have $e^{2\pi i/7}$ is a root of $p(x) = x^6 + x^5 + x^4 + x^3 + x^2 + x + 1 \in \mathbb{Q}[x]$ which is monic and irreducible over \mathbb{Q} . So $e^{2\pi i/7}$ is algebraic over \mathbb{Q} with minimum polynomial $p(x)$.