Algebra I – autumn 2024 – Homework 8

1. Decompose $x^7 + 3x^6 + 2x^5 + 2x^4 - 2x^3 - 14x^2 + 8$ into irreducible factors over $\mathbb{C}$, $\mathbb{R}$, $\mathbb{Q}$ and $\mathbb{Z}$.
2. Find the minimal polynomial of $\sqrt[3]{2} \cdot \sqrt[3]{3 - \sqrt{3}} + \sqrt{3}$ over $\mathbb{Q}$.