
Problem Set 9

Due: Wednesday, October 31

Work all of the following problems. A subset of the problems will be graded. Be sure to adhere to the expectations outlined in the *General Problem Set Guidelines Sheet*.

Unless otherwise stated, all problems can be found in the appropriate *Exercises* sections of the text (*Abstract Algebra* by D. Dummit and R. Foote, 3rd Edition).

- Section 13.2 # 3, 7, 12, 13, 14
- Let $F = \mathbb{Q}(i)$. Prove that $x^3 - 3$ is irreducible over F .
- Find the degree of the following extensions over \mathbb{Q} :
 - (a) $\mathbb{Q}(2 + \sqrt[3]{2})$
 - (b) $\mathbb{Q}(\sqrt{1 + 3\sqrt{3}})$