

Math 567: Abstract Algebra I

Homework 10

10 points total. Due Friday, Apr 15 by 1:10 pm in class.

Problems

1. (2 points) Write down all of the elements of \mathbb{F}_9 and their irreducible polynomials over \mathbb{F}_3 .
2. (1 point) Artin chapter 15 exercises 7.1, 7.7
3. (2 points each) Artin chapter 15 exercises 6.1, 7.6, 8.2

Bonus Problem

(+1 point:) Read the section on proving that e is transcendental in the document that was sent out in an email. Fill in your own proof of the fact that $\int_0^\infty x^k e^{-x} dx = k!$, which was used without proof in the middle of the proof. Then summarize the key ideas of the proof in your own words.