

Math 567: Abstract Algebra I

Homework 10

10 points total. Due Friday, Apr 8 by 1:10 pm in class.

Problems

1. (1 point) Describe how to construct an equilateral triangle using a straightedge and compass.
2. (1 point) Artin chapter 15 problem 5.1
3. (2 points each) Artin chapter 15 problems 5.2(a), 5.2(b), 5.4, 5.6.

Bonus Problem

(+1 point:) Prove that e^2 is irrational as follows. Suppose $e^2 = a/b$ for integers a and b . Then write this equation as $be - ae^{-1} = 0$ and use the same style of argument as in the previous homework's bonus problem to prove that this is impossible.

Then, use a similar method to show that e is not the root of any quadratic polynomial over \mathbb{Q} .