

MAT 150C, Spring 2021
Homework 5

Due before 12:10 on Wednesday, May 12

Please write the homework solutions in connected sentences and explain your work. Mark the answers to each question. Scan or take pictures of your homework and upload it to Gradescope before due time.

1. Solve the equation $x^2 + 3x + 1 = 0$ in the field \mathbb{Z}_{11} .
2. Solve the equation $(3 + 2\sqrt{2})x = 1$ in the field $\mathbb{Q}[\sqrt{2}]$.
3. Decompose the polynomial $x^3 - 2$ into irreducible factors over the field \mathbb{Z}_5 .
4. Prove that the polynomial $x^4 - 2$ is irreducible over \mathbb{Q} .