math123, Abstract Algebra II

PROBLEM SET 7

- Exercise 12.1.1 from Artin's book
- Exercise 12.1.3
- Exercise 12.1.6
- Exercise 12.1.7
- Exercise 12.2.4
- Exercise 12.2.5
- Exercise 12.2.6
- Exercise 12.4.1
- Exercise 12.4.3
- Exercise 12.4.5
- Exercise 12.4.7
- Exercise 12.4.10
- Solve the following

  Problem 1:

  Diagonalize the matrix

$$A = \begin{bmatrix} 3 & 2+i \\ 2-i & 9 \end{bmatrix}$$

  using elementary row and column operations in the ring $\mathbb{Z}[i]$ of Gauss integers.

- Solve the following

  Problem 2:

  Let F be a field, and let

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

  be an F–matrix. The matrix $t\mathbb{1} - A$ can be diagonalized using elementary row and column operations in the polynomial ring $F[t]$. Find the corresponding diagonal matrix.