Reading Questions 5

page 29: Definition 1.60

1. The group $\mathrm{GL}(2, Z_3)$ is a group of matrices.
2. In the general linear group $\mathrm{GL}(n, F)$, F is a field.
3. List an element in $\mathrm{GL}(2, Z_3)$ which contains all nonzero entries. You may use the notation $[[1, 0], [0, 1]]$ to represent the matrix $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Section 1.4 Invertible Matrices (Part 1)

Definitions

P 1. Let $A = \begin{bmatrix} 3 & 2 & 1 \\ 0 & 2 & 1 \\ 0 & 0 & 1 \end{bmatrix} \in \mathrm{GL}(3, Z_5)$. Compute $\det(A)$.

P 2. Let $A \in \mathrm{GL}(2, Z_7)$ such that $A = \begin{bmatrix} 3 & 2 & 1 \\ 0 & 2 & 1 \\ 0 & 0 & 1 \end{bmatrix}$. Determine if $A \in \mathrm{SL}(2, Z_7)$.