EXAM FOR "ALGEBRAIC STRUCTURES" (6ALGS)
SUMMER SEMESTER 2023/2024

QUESTIONS SET NO. 6

1.
Give definition of a prime field. Illustrate this notion by examples.

2.
Is it true that if S is a subring of a ring R, then the additive group of S is a subgroup of an additive group of R?

3.
Let $\lambda \in \mathbb{R}$, and M_λ is the set of all nonzero matrices of the form

$$\begin{pmatrix} x & y \\ \lambda y & x \end{pmatrix}$$

where $x, y \in \mathbb{R}$. For which values of λ, M_λ is:
a) a group
b) a simple group
with respect to the usual matrix multiplication?