

Section 3.1, #13, 19, 20

Section 3.2, #6, 9, 14

Let G be an abelian group, and let K be a subgroup of G . Let $H = \{g \in G \mid g^2 \in K\}$. Prove that H is a subgroup of G .

Show that $S = \left\{ \begin{bmatrix} a & b \\ c & d \end{bmatrix} \mid ad - bc \neq 0, a + b = 1 \text{ and } c + d = 1 \right\}$ is a subgroup of $GL_2(\mathbf{R})$.

1. Let G be an abelian group. Show that the set of all elements of G of finite order is a subgroup of G .

2. Let G be an abelian group, and let K be a subgroup of G . Let $H = \{g \in G \mid g^2 \in K\}$. Prove that H is a subgroup of G .