

Homework #4 - Elementary Modern Algebra I (Fall 07)

09/17/07

Please, write down your solutions neatly and explain your reasoning clearly.

1. (4 points) Determine the group table of the group (D_3, \circ) .
2. (4 points) Let (G, \cdot) be a group. Show that:
 - (a) For every $a \in G$ and every $n \in \mathbb{N}$ we have $(a^n)^{-1} = (a^{-1})^n$.
 - (b) For $a, b \in G$ the equation $(ab)^2 = a^2b^2$ is true if and only if a and b commute, that is, we have $ab = ba$.
3. (4 points) Argue that $G := \{a + b\sqrt{3} \mid a, b \in \mathbb{Q}\}$ is a subgroup of $(\mathbb{R}, +)$.

Due date: September 24, 2004