

Reading Quiz §0 & 2

1. [2] Create an equivalence relation on the set $\{0, a, b, c\}$. Identify all the equivalence classes.

2. [1] Give an example of a set and binary operator that does not form a group. Explain what group properties are not met.

3. [2] Consider the set $\{1, i, j, k, -1, -i, -j, -k\}$ along with a binary operator defined by the following Cayley table. Does this form an abelian group? Justify your answer (but you can assume the operator is associative!).

| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| * | 1 | i | j | k | -1 | -i | -j | -k |
| 1 | 1 | i | j | k | -1 | -i | -j | -k |
| i | i | -1 | -k | j | -i | 1 | k | -j |
| j | j | k | -1 | -i | -j | -k | 1 | i |
| k | k | -j | i | -1 | -k | j | -i | 1 |
| -1 | -1 | -i | -j | -k | 1 | i | j | k |
| -i | -i | 1 | k | -j | i | -1 | -k | j |
| -j | -j | -k | 1 | i | j | k | -1 | -i |
| -k | -k | j | -i | 1 | k | -j | i | -1 |