Proofs: Homework 2

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Problem 3:

Part a:

Part i:

Subgroups of $Z/5$: $\{1\}$, $\{1,2,4\}$, $\{1,3\}$, $\{1,4\}$, $\{1,2,3,4\}$

Subgroups of $Z/10$: $\{1\}$, $\{1,3\}$, $\{1,4,7\}$, $\{1,3,7,9\}$, $\{1,9\}$, $\{1,2,3,4,5,6,7,8,9\}$

Part ii:

Since m is an integer where Z represents the integer set. Given that $k \in Z$, we know that k is an integer. Thus we know that $mk \in Z$. And it is a subgroup of Z because mk represents the additive subgroup of field Z/m.

Problem 4:

Part a

Part b

Part c

Part d