Homework 1

- Textbook p404-405: 2, 8, 14, 16
- Let $S_k=\{x|x \in \mathbf{Z}, x\geq k\}$, $k \geq 0$, show that$<S_k, +>$ is a semigroup.
- Show that $<P(S), \oplus>$ is a monoid. ($A \oplus B=(A \cup B)—(A \cap B)$)
- Let $f : \mathbf{R} \rightarrow \mathbf{R}$, $f(x)=5^x$, show that f is a homomorphism from $<\mathbf{R},+>$ to $<\mathbf{R},\cdot>$.
- Let $H=\{x|x=dn\}$, where d is a certain integer, $n \in \mathbf{Z}$. Show that <Z,+> and <H,+> are isomorphic.