1. Let’s look at the relationship between a set $A$ and its power set $\mathcal{P}(A)$.
   
a) For a set $A$, show that $A \in \mathcal{P}(A)$.
   
b) Find a set $B$ such that $B \not\subseteq \mathcal{P}(B)$.
   
c) Find a nonempty set $A$ such that $A \subseteq \mathcal{P}(A)$. (I say nonempty, because the empty set $\emptyset$ is a subset of everything, in particular its power set.)

2. Let $a, b$ be real numbers with $a \cdot b = 0$. Prove that if $a \neq 0$, then $b = 0$.

3. Assume $n \in \mathbb{N}$. Prove that if $n^2$ is odd, then $n$ is odd.